



The impact of electronic health records on collaborative work routines: A narrative network analysis



Chia-An Chao

Scott College of Business, Indiana State University, 30 North 7th Street, Terre Haute, IN 47809, USA

ARTICLE INFO

Article history:

Received 1 December 2015

Received in revised form 27 June 2016

Accepted 28 June 2016

Keywords:

Electronic health record
Computerized patient documentation
Collaboration
Organizational routine
Narrative network

ABSTRACT

Purpose: This study examined collaborative work routines and changes after the implementation of a perinatal EHR. The change process and underlying drivers were analyzed to offer insight into why changes – intended or unintended – did or did not occur and their implications for EHR design and implementation. **Methods:** This mixed-method case study included both qualitative and quantitative information. Pre- and post-implementation observations took place over an 18-month period totaling 90 h. Formal and informal interviews with administrative and clinical staff, pre- and post-implementation surveys, project meeting observations, and artifact review supplemented data gathered from the observations. Workflow and narrative network analyses of work routines were used to identify changes pre- and post-EHR and to represent different perspectives of work routines. **Results:** EHR improved documentation efficiency and in- and out-patient information exchange, but increased variability in documentation. Some variabilities were institutionally sanctioned or tolerated, but other variabilities – while ingenious and emblematic of the generative nature of routines enabled by the EHR – were problematic. EHR's support for clinician communication and coordination was limited and its cognitive support insufficient. In some cases, EHR increased cognitive load as the unlocalized EHR scattered information, and the lengthy printouts contributed to information fragmentation and made information retrieval more difficult. **Conclusions:** The process of the EHR implementation and the changes observed was the confluence of three factors: resource constraint – in particular EHR expertise and experience – not uncommon in many community hospitals; the functional properties of the EHR focusing on information aggregation, storage, and retrieval; and the extant culture and practice of healthcare emphasizing autonomy and flexibility. While collaborative and communication changes were prompted by EHR implementation, the system played a minimal role in mediating changes. Instead, changes in work routines were negotiated between the administration and clinicians, and jointly refined over time.

© 2016 Elsevier Ireland Ltd. All rights reserved.

1. Introduction

Electronic health records (EHR) adoption has become imperative for healthcare providers, upon the urges of the Institute of Medicine [1] to improve care quality and reduce costs, and more recently, driven by the Centers for Medicare and Medicaid Services reimbursement and incentives payment for meaningful use of EHR [2,3]. EHR promises more complete, comprehensive, and uniform documentation of patient information and clinical encounters than paper charting. As noted by a number of researchers, computerized patient documentation is an essential information source and a communication channel to create a shared view of

the patient among collaborating clinicians (e.g., [4–7]). Compared to paper charts, computerized documentation allows ubiquitous information access by multiple users and overcomes such issues as legibility and security. However, a review of the medical informatics literature found mixed results of EHR adoptions and the need for better understanding of the impact of EHR on workflow and work disruptions [8–22]. This paper begins with a review of EHR implementation studies, highlights knowledge gaps identified in the literature, and introduces organizational routines [23] as the theoretical framework for an EHR impact study on collaborative work routines that was conducted in the perinatal services department of a community hospital in a mid-sized city in Midwestern United States that had adopted a perinatal EHR. By conducting both pre- and post-implementation observations and surveys, this study aims to address the need for a better understanding of the

E-mail address: cchao@indstate.edu

dynamic relationship between technology and various organizational factors. Insight into the interactions among technology, work processes, and users gained from this study can then be used to minimize the disruptive effects of EHR on clinical work, to understand causes of variability in work routines, and to improve EHR implementation outcomes.

1.1. A review of EHR implementation studies

Both positive and negative outcomes have been found in EHR implementation studies. Early adopters of computer-based documentation [8] reported overall favorable effects, in particular, timely sharing of patient documentation, accessibility of patient information, improved communication between clinicians, and enhanced patient care. Improvement in documentation quality and efficiency were reported in other studies [10,18,21], along with improved communication and coordination among healthcare providers [17,18], and neutral outcomes where electronic documentation was found to have no impact on the communication duration and content between doctors and nurses [15]. Other studies reported less favorable outcomes, including inadequate support rendered by computerized patient documentation for meeting clinicians' information, communication and coordination needs [4,5], increased cognitive burdens [9,13,19], increased task switching and documentation time [4–6,9,13,16,21,22] resulting in a higher number of incomplete charts [13], increased use of paper notes [9,13], and disruption of workflow, in particular, communication and coordination among clinicians [9,11,12,14–16,18,20–22]. Other issues identified were the structured/templated documentation in EHR not only infringed on clinician autonomy, but it also fragmented interconnection of patient data and hindered the clinician's ability to develop a full, coherent story of the patient; and the overuse of copying and pasting in computerized documentation led to redundant, and sometimes inaccurate and unreliable, patient information [5,6,21,22].

Health information technology adoption is multifaceted, complex and involves a number of factors beyond technical functions and features. Over the years, a number of theoretical and evaluation frameworks have been proposed for more comprehensive and systematic study of this phenomenon (e.g., [24–26]). Yet, from the literature review, the disruptive effects of EHR persist, due in part to the lack of in-depth understanding of the dynamic interactions between technology and clinical work and the over-simplified, predominantly technology-oriented design, development and deployment of health information systems [27]. In fact, the call for improved understanding of the nature of clinical work and work processes, the organization context, and the interaction between health IT and the sociotechnical systems of the organization in order to mitigate the disruptive effects of health IT has been repeated in a number of studies [9,12,15,16,18,28–32].

Heeding the call for a better understanding of clinical workflow and the influence of contextual factors in EHR implementation, this study examines the impact of an EHR on clinician collaboration using the theoretical framework of organizational routines [23,33].

1.2. Organizational routines

Organizational routines are at the core of organizational functions. Feldman and Pentland [23] define organizational routine as “a repetitive, recognizable pattern of interdependent actions, involving multiple actors.” For some, work routines signify mindlessness or inertia, but routines store knowledge, so routines can reduce cognitive load, reduce uncertainty, focus decision choices, and increase cognitive efficiency [23,33]. Also, routines are effective tools for enforcing consistency and standardizing actions thereby reducing variability of actions, and strengthening institutional control and

establishing legitimacy. While routines may facilitate reenactment of the activity patterns, such reenactment is not automatic. Through reflection in and on action, each performance may be different to adapt to the current demand.

According to Feldman and Pentland [23], routines consist of two aspects: ostensive and performative. The ostensive aspect of a routine is the abstract ideas of a routine or the structure that guides actions, and it may be used to account for activities retrospectively. The performative aspect is the actual performance of the routines and is influenced by the agency of actors. It is subjective and “aligns with the interest of labor.” Feldman and Pentland take into account the power dynamics affecting work routines. In the healthcare setting, the ostensive aspect of work routines is shaped by guidelines set by accreditation bodies (e.g., JCAHO), professional organizations (e.g., AWHONN), as well as the healthcare organization itself. On the other hand, the performative aspect is heavily influenced by the domain knowledge and professional autonomy of clinicians. Therefore, the dual administrative structure in many healthcare organizations means decisions and actions are often negotiated instead of dictated, and the agency of the clinicians is often observed in their individualized practices and decisions.

Routines are at the nexus of structure and action [33], and they help explain why certain changes happen and what role agency plays in that process. As noted previously, technologies such as EHR can be disruptive and affect clinicians' activity patterns and cognitive regularity. Yet, in a study of technology-mediated organizational change, Volkoff et al. [34] identified another aspect of organizational routines – the material aspect – where routines were embedded in an enterprise system, and the material aspect drew the performative aspect of the routines closer to the ostensive aspect. Their study provided valuable insight into the underlying mechanism of change. However, the extent to which such mechanism is observed in the healthcare practice remains to be seen.

Healthcare practices are inherently ad hoc and contingent and are often characterized as improvisational [35]. Clinicians adjust their work activities to respond to the moment-to-moment changes in patient trajectory while meeting various other competing demands. Despite the improvisational nature of the healthcare practice, there is pressure for consistency and standardization of practice [1]. Routines are generative, flexible and adaptive to change, yet they can help control variability and reduce cognitive load. In a work setting such as healthcare, where there is very little room for error, more in-depth studies of healthcare work routines and the interaction between technologies and routines are needed [36].

1.3. Study focus and questions

In this qualitative study, two key components of collaborative work routines – communication and documentation – for maintaining continuity of care and the changes after the implementation of an EHR were examined. The choice of this study's focus was motivated by the importance of collaboration in patient care, which is heavily dependent on constant communication among clinicians to coordinate patient care activities and ensure continuity of care. Clinicians use various channels of communication to create joint action [4] that requires clinicians to develop a shared understanding of the situation and maintain the common ground, upon which they negotiate responsibilities and coordinate their actions [37]. Communication is the foundation of collaborative action; it is the mechanism for establishing and maintaining the common ground for coordinated and adaptive actions and for repairing miscommunication along the way. While verbal communication is frequently used, since it requires relatively low cognitive resources [37], other forms of communication, supported by cognitive artifacts, are common in the clinical setting to initiate joint actions and coordinate

Download English Version:

<https://daneshyari.com/en/article/515987>

Download Persian Version:

<https://daneshyari.com/article/515987>

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