

Levels of strategies used by care managers to deal with health IT-related barriers

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Abstract. Care managers play an important role in coordinating care for chronically ill patients. They encounter various barriers related to the use of multiple health information technologies (IT) to access and process patient-related information and coordinate patient care. Using combined interviews and observations with 14 care managers in outpatient physician practices and hospitals, we identified different levels of strategies used by care managers in dealing with health IT-related barriers. These include individual (e.g., using a different system to find necessary information), team (e.g., getting help from other care managers) and organizational (e.g., reporting problems to their supervisor) strategies.

Keywords. Care manager, strategy, health information technology, care coordination

1. Introduction

Patients with chronic conditions experience challenges related to their care coordination when multiple healthcare providers and organizations are involved and need to share information (McDonald et al., 2007). Because patients with chronic conditions such as chronic obstructive pulmonary disease (COPD) and congestive heart failure (CHF) often transition across multiple healthcare organizations (e.g., a CHF patient managed as an outpatient presents to emergency department with acute exacerbation and is admitted to the hospital), care managers play an integral role in coordinating care throughout a patient's clinical journey (Oliva, 2010). In this process, care managers need to use multiple health information technologies (IT) to obtain, process, document and share patient-related information (e.g., summary of hospital stay). Our previous research shows that care managers encounter various barriers when using multiple health IT applications (Alyousef et al., 2012; Carayon et al., 2012). In this study we focus on how care managers deal with health IT-related barriers they experience while coordinating care for patients with COPD and CHF.

Work places such as healthcare settings are complex and dynamic sociotechnical systems where multiple levels of decision making are nested and interact with each other (Karsh, Holden, Alper, & Or, 2006; Rasmussen, 2000). Workers such as care managers, with demanding responsibilities, often experience barriers related to different aspects of their work system; therefore, their ability to solve problems and adapt to stressful conditions becomes essential (Carayon, Gurses, Hundt, Ayoub, & Alvarado, 2005; Cook & Woods, 1996). Research has described different types and levels of problem solving

by healthcare workers, e.g., temporarily solving problems versus involving management to permanently fix problems (Tucker & Edmondson, 2003). Research on healthcare technologies has begun to describe strategies used to deal with technology-related barriers at individual and organizational levels (Novak, Holden, Anders, Hong, & Karsh, 2013). Using a systems approach, this study examines different levels of strategies (i.e., individual, team and organizational) that care managers use to deal with health IT-related barriers.

2. Methods

2.1 Study setting and sample

Care managers use their clinical expertise to coordinate patient care through activities such as patient education, coordination of follow-up care with providers and monitoring of patient status (Maliski, Clerkin, & Litwin, 2004; Oliva, 2010). In our study, care managers work in hospitals, outpatient clinics and a Transition of Care Center (TOC – a telephonic call center), and use various health IT to support their activities such as documenting, processing and sharing information across multiple organizations. These health IT include: a care management documentation system, an integrated electronic health record, a health information exchange, local information systems, and other communication technologies such as email, instant messaging, telephone and fax. A total of 14 care managers participated in this study, including 5 inpatient care managers working in four hospitals, 4 outpatient care managers from two clinics, and 5 care managers from the TOC center.

2.2 Study procedures

Institutional Review Board approval was obtained from the lead healthcare organization. A semi-structured interview guide with open-ended questions was used to understand the work of care managers and their use of tools and technologies. We conducted interviews in a private room during work time. Interviews lasted approximately one hour and were audio recorded. Observation notes were hand written by interviewers. Over a period of 21 months, 6 out of 14 care managers were interviewed once or twice and 8 care managers were interviewed three times or more. These multiple rounds of data collection resulted in a total of 41 combined interviews and observations or interviews alone.

2.3 Data analysis

All transcripts and observation notes were imported into NVivo©, a qualitative data analysis software. To identify strategies care managers use to deal with health IT-related barriers, we conducted a qualitative content analysis of interview transcripts and observation notes. Barriers and corresponding strategies were identified. A list of strategies was developed through an iterative analysis process that involved initial coding of 5 interviews by 2 researchers, development of an initial node structure of barriers and corresponding strategies; coding of the next 20 interviews by 2 researchers, revision of the strategies, coding of the rest interviews by the same 2 researchers; and a final review of the list of strategies by a third researcher.

3. Results

We identified a range of strategies that care managers use to deal with health IT-

related barriers. Strategies were categorized at the individual, team and organizational levels. The remainder of this section presents a selection of strategies at each level.

3.1 Individual-level strategies

Some information cannot be shared between health IT applications because of a lack of interoperability, so care managers have to double document in different health IT applications by copying and pasting information from one to another. An outpatient care manager explained: “... everything I do in here, I have to carry over to [a local health IT], so I do a lot of copy and pasting from [care management software] and putting my notes over in [a local health IT].” Observations captured a similar activity where a care manager reviewed a patient’s record in an integrated health IT and copied and pasted some of the information into the case management software.

Information in the health information exchange (HIE) may not always be up-to-date, and this requires that care managers use other health IT to find necessary information. A TOC care manager used the HIE and another health IT to look for information about a patients’ current status. She found that relying on the HIE alone is not sufficient to accomplish her work.

Issues related to health IT interface design also trigger care manager strategies. For example, some of the drop-down menus in the care management software do not offer an exhaustive list of options. In dealing with this barrier, care managers use two different strategies: (1) typing the information as free text or (2) choosing one of the available options that is as close as possible to what they actually need.

3.2 Team-level strategies

Several team-level strategies were identified that involved care managers reaching out to colleagues for assistance. For instance, care managers ask medical management assistants to fax documents when information the care manager needs is not available in the health IT or if the fax machine is not available. For example, an outpatient care manager described: “when I was doing my phone calls and needed things faxed, I tried doing it from this fax machine, and this fax machine is so busy.” She used instant messaging to contact the medical management assistant: “Could you please fax the PCP [primary care physician] the discharge instructions?” The medical management assistant then informed the care manager when this was done. In another instance, an outpatient care manager asked the medical management assistant to fax documents when the information in the HIE was not up-to-date. Care managers also get help from health IT technicians when encountering technical problems, as an inpatient care manager explained: “...Sometimes I do have problems where I go down with the hospital server here... I have to rely on their IT people to bring me up...”

Care managers also verbally communicate with other care managers when they do not find information in one of the information systems (e.g., information about a patient’s hospitalization). One outpatient care manager had a patient recently discharged from the hospital, but there was no information about this patient in the health information exchange. So she telephoned the inpatient care manager who was taking care of the patient to get the information she needed.

3.3 Organizational-level strategies

We found several instances when care managers reported health-IT related problems to their supervisor or manager. In one case a care manager had difficulty finding discharge information about surgical patients because discharge summaries were not entered in the electronic health records. She therefore needed to look for the paper medical record, which

was hard to read. She later reported this barrier to her supervisor hoping that information could be computerized and available in the health IT. An outpatient care manager did not have access to the integrated electronic health record, which caused her to request that other care managers send her information via fax. She reported this to her supervisor in order to get access to the integrated EHR. There was another instance when a care manager reported physical ergonomic problems related to her computer to the case management director.

4. Discussion and Conclusion

Health IT-related barriers are common for care managers using multiple health IT when coordinating care for chronically ill patients (Alyousef et al., 2012; Carayon et al., 2012). Some barriers include lack of interoperability between technologies, technology interface design problems, duplicate documentation and information entry, and outdated information. Whenever possible, barriers should be eliminated to support care manager work, but in some instances, this may not be immediately feasible. The Balance Theory (Smith & Carayon-Sainfort, 1989) implies that when it is hard to eliminate negative aspects in a work system, positive aspects such as leveraging workers' skills can compensate for the negative aspects. Therefore, it is important to understand how care managers deal with barriers.

In this study, we identified strategies at three levels: individual, team and organizational. Care managers developed strategies at the *individual* level in dealing with such barriers as duplicate documentation in multiple health IT, insufficient patient information in one health IT and usability problems of the health IT interface. However, care managers are not able to deal with all barriers by themselves. When dealing with barriers such as getting information from another healthcare setting, technical problems with the health IT application, and unavailability of a fax machine, care managers *collaborate with others* and seek help. They use different communication media (e.g., email, instant messaging, telephone) to get help from medical management assistants, other care managers and health IT technicians. Care managers also involve their *organization* by reporting health IT-related barriers to their supervisor, hoping the problems can be resolved at a higher level.

A defining characteristic of human factors and ergonomics research is "explicitly adopting a systems view" (Wilson, 2014). A central idea of the systems approach is to examine different levels of a system and their interactions. Though the application of systems ergonomics has been expanding in the healthcare domain, a recent systematic review shows that most studies addressed system concerns at an individual level with only a few studies looking across multiple system boundaries (Waterson, 2009). Our study utilizes a systems approach to look at care managers' strategies at the individual, team and organizational levels, respectively referred to as 'micro', 'meso' and 'macro' levels of analysis by Karsh, Waterson and Holden (2014). The need to integrate these levels is emerging in macroergonomics research.

The primary objective of our interviews was to assess work system barriers and facilitators. In the course of the interviews, care managers also talked about strategies they use to deal with health IT-related barriers. Because we did not systematically ask follow-up questions whenever a care manager mentioned a barrier, this may have limited us from thoroughly and systematically capturing all the strategies they use. We relied on care managers' reports and, therefore, may have missed organizational-level strategies they report to their supervisor. Future research should systematically examine how healthcare workers deal with health IT-related barriers from multiple perspectives, including that of

management. These data can help organizations better identify health IT-related barriers and understand how healthcare workers deal with these barriers. The problems and solutions identified then can be used in work system redesign effort to support healthcare work.

Acknowledgments

Funding for this research was provided by the US Office of the National Coordinator through the Beacon award program [award No. 90BC001301].

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