The Introduction of an Electronic Patient Care Information System and Health Care Providers’ Job Stress: A Mixed-Methods Case Study

Jean E. Wallace, University of Calgary, Canada
Steven P. Friesen, University of Calgary, Canada
Deborah E. White, University of Calgary, Canada
Janet G. Gilmour, University of Calgary, Canada
Jane B. Lemaire, University of Calgary, Canada

ABSTRACT

In this paper, the authors explore how the introduction of an electronic Patient Care Information System (PCIS) relates to changes in health care providers’ (HCPs’) perceptions of computer use, quality of patient care and job stress. Data were collected using a mixed-methods case study approach over a 20 month period following the introduction of this system. Initially stress levels appeared to increase, but over time declined significantly. After 3 months, the majority of HCPs reported they spent more time entering, retrieving and searching for patient information than before; however, these increases in computer use were unrelated to HCP stress. The potentially negative impact of the system on the quality of patient care was highly correlated with increased job stress. After 20 months, HCPs reported spending less time searching, entering and retrieving patient information, but these indicators of computer use were now highly correlated with stress. While some negative perceptions of the impact of the PCIS declined over time, HCPs reported ongoing stress related to concerns about quality of patient care even after 20 months of use.

Keywords: Electronic Health Records, Health Care Provider Stress, Mixed Methods, Patient Care Information System (PCIS), Quality of Care

INTRODUCTION

Health care organizations frequently introduce innovations in health care delivery as they strive to provide safer and more cost effective services (Poissant, Perieria, Tamblyn & Kawasumi, 2005; Chaudhry, Wang, Wu, Maglione, Mojica, et al., 2006; Menachemi & Brooks, 2006; Sidorov, 2006). For health care providers (HCPs),...
innovations and the subsequent organizational change may be disruptive and intrusive as it upsets the balance of their already unpredictable and complex work day. While innovations are often judged primarily by evaluating their impact on patient care (Van Der Meijden, Tange, Troost & Hasman, 2003) or health care costs (Menachemi & Brooks, 2006; Sidorov, 2006), less research has assessed the impact of health care innovations on HCPs’ attitudes or work experiences (Anderson & Balas, 2006; Liang, Xue & Wu, 2006; O’Neill, Talbert & Klepack, 2009; Wager, Zoller, Soper, et al., 2008). The technology acceptance model, derived from the theory of planned behavior, proposes that when a technology is believed to be less effective, less advantageous and/or more difficult to use, HCPs will hold more negative attitudes towards the technology and are less likely to use it (Ilie, Van Slyke, Courtney & Styne, 2009; Liang et al., 2006; Sittig, Kuperman & Fiskio, 1999; Trimmer, Cellucci, Wiggins & Woodhouse, 2009; Wager et al., 2008). In this study, we adopt a mixed-methods case study approach to assess the impact of the introduction of an electronic Patient Care Information System (PCIS) as part of the electronic health record (EHR) on the job stress of HCPs working on a single medical unit.

The term electronic health record refers to a paperless form of a patient’s medical record where HCPs can enter and retrieve information utilizing a computerized system rather than writing in a paper chart. An EHR can be comprehensive, interfacing with other health care information systems from departments such as pharmacy, diagnostic imaging and laboratory services, allowing HCPs direct access to diagnostic results and treatment options. EHRs with computerized physician order entry (CPOE) capabilities allow physicians and other HCPs to manage medical orders collaboratively and inter-professional communication tools, such as electronic messaging systems, can be incorporated. EHRs may also bridge geography by providing access to patient information and linking independent sites in the retrieval of stored information from previous patient encounters in primary care or acute and ambulatory care settings.

Although one of the key benefits promoted in favor of EHR systems is the potential to improve the quality and safety of patient care (Ammenwerth, Schnell-Inderst, Machan & Sibert, 2008; Chiang, Boland, Margolis, Lum, Abramoff & Hildebrand, 2008; Delpierre, Cuzin, Fillaux, Alvarez, Massip & Lang, 2004; Pizziferri, Kittler, Volk, Honour, Gupta, et al., 2005; Poissant et al., 2005; Menachemi & Brooks, 2006; Murff & Kanny, 2001), several systematic reviews of this topic have been inconclusive (see Johnston, Langton, Haynes & Mathieu, 1994; Shiffman, Liaw, Brandt, & Corb, 1999; Delpierre et al., 2004). In addition, HCPs may be reluctant to use EHR systems (Anderson & Balas, 2006) and one of the contributing factors may be concerns that the system is less time efficient than paper systems (Tierny, Overhage, McDonald, & Wolinsky, 1994; Van Der Meijden et al., 2003; Wager et al., 2008). The 2005 systematic review by Poissant et al. examining the impact of EHR systems on the efficiency of physicians’ and nurses’ documentation time reported mixed results. They conclude that their review does not identify a clear trend towards greater efficiency with computerization and that there are likely factors external to the EHR system that need to be taken into account to better understand it impact on documentation time.

To compound this complex issue, HCPs’ self reports of spending more time on an activity may not always be accurate (Tierny et al., 1994). Regardless, perceptions of an increased workload are relevant to HCPs’ satisfaction and stress levels (Murff & Mannry, 2001; Joos, Chen, Jirjis & Johnson, 2006) and the eventual success of EHR system implementation (Van Der Meijden et al., 2003). That is, HCPs’ use of an electronic PCIS is not only affected by the technological characteristics of the system, but may be largely influenced by individuals’ beliefs and attitudes towards the technology (Liang et al., 2006). In this study, we focus on the extent to which the introduction of an electronic PCIS as part of the EHR is related to changes in HCPs’
Identifying Factors for Successful Implementation of Simulation Modeling in Healthcare
[www.igi-global.com/article/identifying-factors-for-successful-implementation-of-simulation-modeling-in-healthcare/136980?camid=4v1a](www.igi-global.com/article/identifying-factors-for-successful-implementation-of-simulation-modeling-in-healthcare/136980?camid=4v1a)

A System for the Semi-Automatic Evaluation of Clinical Practice Guideline Indicators
[www.igi-global.com/article/a-system-for-the-semi-automatic-evaluation-of-clinical-practice-guideline-indicators/126987?camid=4v1a](www.igi-global.com/article/a-system-for-the-semi-automatic-evaluation-of-clinical-practice-guideline-indicators/126987?camid=4v1a)