Chapter 6
Exploring the Effect of mHealth Technologies on Communication and Information Sharing in a Pediatric Critical Care Unit:
A Case Study

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ABSTRACT

Communication and information sharing is an important aspect of healthcare information technology and mHealth management. A main requirement in the quality of patient care is the ability of all health care participants to communicate. Research illustrates that the complexity of communicating within the health care system hinders the quality of health care service delivery. Health informatics have been touted as a way to improve communication deficiencies, which has led to the exponential growth of health informatics integration. However, research still lags in understanding how health informatics affects patient care, health professional work routines, and the overall health care system. This study investigates the extent to which mHealth technologies influence communication information sharing patterns between interdisciplinary health care providers in the delivery of health care services. This study was conducted at Hamilton Health Sciences and through a sociotechnical approach, focuses on both the end user's experiences with mHealth in daily work communication scenarios, and the extent to which mHealth use affects interdisciplinary communication. Results indicate that there are several mitigating factors which influence communication patterns using mHealth technologies, including: information sharing, mobility, ergonomic and system design.

INTRODUCTION

The introduction and integration of new technologies into the Canadian healthcare system represents a major area of interest and debate within contemporary Canadian healthcare research (Wallace, Friesen, White, Gilmour, & Lemaire, 2010). Health care reform in Canada is intertwined with major technological and organizational changes that are altering the landscape of health care delivery in Canada. Eisler, Tan, and Sheps (2006) noted, "Among key drivers of health care reform in Canadian society are the challenges faced by the rapid rate of technological change and its impact on organizational performance in terms of efficiency, cost effectiveness, and innovation in business and operational processes" (1). The importance of effective and efficient communication in health care has been supported by four decades of research in various fields and disciplines (Coiera, 2003; Edwards et al., 2009). In 1973 Foucault investigated the effect of communication in health care settings and found that communication plays an integral role in the overall quality and efficiency of patient care. More recent investigations into this phenomenon have demonstrated that communication between health care professionals throughout treatment is essential to the successful management of the patient's overall health (Herrman, Trauer, & Warnock, 2002; Edwards et al., 2009; Coiera & Tombs, 1998; Coiera, 2000, 2003). A 2001 study of two emergency departments by Coiera, Jayasuriya, Hardy, Bannan, and Thorpe (2002) concluded that ninety percent of all information transactions occurred between health care providers. However, these communication events are not always optimal and can lead to adverse medical events, resulting in increased risk to patient safety. Lingard et al. (2004) found that communication errors occurred 30% of the time, and that a third of these errors led to lapses in patient safety. Quantifiably, researchers estimate that, in Canadian hospitals, up to 24,000 deaths annually from adverse medical events could have been prevented (Baker et al., 2004). Although there is little consensus on the amount of medical incidents that are related to poor communication, several researchers agree that effective communication is imperative to the quality of patient care and the determent of medical error (Stebbing, Wong, Kaushal, & Jaffe, 2006; Leonard, Graham, & Bonacum, 2004; Lingard et al., 2004; Fortescue et al., 2003; Pirnejad, Bal, & Berg, 2008).

Coiera and Tombs' (1998) evaluation of communication in a British general hospital concluded that "the health care system seems to suffer enormous inefficiencies because of poor communication infrastructure and practices" (p. 673). This points to intrinsic issues in health care facilities today: inadequate communication due to mediocre information channels; and sometimes archaic, mediums; and the ignorance of effective communication strategies. These types of deficiencies result in a highly interruptive work environment, information bottlenecks, and miscommunication, which all ultimately affect the quality of patient care as well as placing unnecessary stress on health care providers. As such, there is a great need to understand how to harness this information in order to improve these interactions without causing harm to patients or undue stress to providers.

The use of health informatics to improve communication between health care providers has been a point of contention in the health care field as there is little consensus or valid data to suggest it enhances patient care. With the introduction of the Internet into health care organizations electronic medical records (EMRs) were developed and propelled the uses of health informatics in health care. This began to snowball into other technologies and support tools focused on creating a more efficient health care system whilst improving patient care. However, the introduction of such technologies were founded on premature, or based on faulty research data. As a result, funds were misused and unnecessary stress was placed on the

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