Short message service or disService: Issues with text messaging in a complex medical environment

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ABSTRACT

Background: Hospitals today are experiencing major changes in their clinical communication workflows as conventional numeric paging and face-to-face verbal conversations are being replaced by computer mediated communication systems. In this paper, we highlight the importance of understanding this transition and discuss some of the impacts that may emerge when verbal clinical conversations are replaced by short text messages.

Methods: In-depth interviews ($n = 108$) and non-participatory observation sessions ($n = 260$ h) were conducted on the General Internal Medicine wards at five academic teaching hospitals in Toronto, Canada.

Results: From our analysis of the qualitative data, we identified two major themes. Decontextualization of complex issues led to an increase in misinterpretation and an increase in back and forth messaging for clarification. Depersonalization of communication was due to less verbal conversations and face-to-face interactions and led to a negative impact on work relationships.

Conclusions: Text-based communication in hospital settings led to the oversimplification of messages and the depersonalization of communication. It is important to recognize and understand these unintended consequences of new technology to avoid the negative impacts to patient care and work relationships.

1. Background

Smartphones are increasingly being adopted as a means of communication within hospitals [1–3]. Smartphones have the ability to support both voice and text messaging, and they create a platform for asynchronous communication in addition to providing access to medical applications and the Internet. For these reasons, experts believe that smartphones may not only serve as efficient communication tools but may also improve the coordination of patient care in the clinical setting [4].

However, there may be issues with their use within hospitals where the complexity of medical work is compounded with a tradition of professional fragmentation and a diffusion of accountability [5]. There is increasing recognition that the implementation of information technology in the complex health care environment can result in unintended consequences with increased errors. Increased errors have been seen with computerized physician order entry, clinical decision support systems, and barcode medication administration [6,7], and therefore, it is important to identify the unintended consequences of replacing pagers with smartphones in order to mitigate them.

The use of smartphones is moving conversations that were traditionally face-to-face or by telephone to a more text-based communication mode [8]. Such computer-mediated communication (CMC) has known effects and has been described previously in literature external to healthcare. CMC is a term used to describe the broad concept of communication, the transfer of information, via any technological means. This includes telephone calls, Skype calls, short message service, and instant messaging among many others. Of the CMC mediums, text-based is the least media rich, after voice-only and voice and video communication. Although CMC is similar to conversation by being "interactive, relatively spontaneous and generally unplanned," [9] it changes the way people connect [10]. Although CMC affords users the ability to alleviate barriers in space and time, it is sometimes described as a rarefied form of conversation because it does not always support meta-communicative features like facial expression, posture and tone of voice which add richness to communication [11]. As opposed to other forms of text-based communication such as email, text messaging dilutes social presence and media richness further as communication is reduced to a short message, typically less than 140 characters [12]. In a clinical environment, text messaging can be especially limiting when complex information is conveyed with only a few characters and can lead to miscommunication between senders and receivers. This can damage an already sensitive interprofessional relationship [13].

Recent research on CMC in hospitals, and specifically the use of smartphones and texting between clinicians, has shown improvements in efficiency, but it is important that we also understand the unintended consequences [13,14]. Text-based messaging can also lead to ineffective communication and deteriorate interprofessional relations. In order to understand the impact of text-based communication, we examined this aspect through the lens of computer-mediated communication.

2. Methods

2.1. Study design

To provide a more comprehensive understanding of clinicians' experiences with the communication technologies in the hospital settings, we adopted an exploratory case study approach [15,16] consisting of data triangulation from multiple sources that included (a) semi-structured interviews and (b) non-participatory ward observation methods. This dataset is part of a larger multi-site study that evaluated the impact of different types of communication interventions and initiatives in hospital settings [8]. The original study was conducted on the General Internal Medicine (GIM) wards at five academic teaching hospitals that are affiliated with the University of Toronto, Canada. In this paper, we explore the implications of moving towards text-based communications on interprofessional relationships among medical teams and clinicians.

2.2. Setting

Each participating hospital has two to four GIM wards that are located on different floors within the respective medical facilities. Each site has clinical teaching units with typically four medical teams, each consisting of an attending physician, a senior resident, junior residents and medical students. Four of the five hospitals have adopted text-based communication channels as part of clinicians' routine workflow (Table 1).

2.3. Data collection

Qualitative data consisting of in-depth interviews and non-participatory ward observations were collected from June 2009 to September 2010 across the five hospital sites. Ethical approval was obtained from the respective institutions' Research Ethics Board committees.

2.3.1. Interviews
Participants were selected and solicited through purposeful and criterion-based sampling techniques to ensure a variety of appropriate data sources were obtained. The criteria for recruitment were that participants had to be practicing

Table 1 – Different communication devices and methods adopted at the five hospitals.		
Site	Communication method	Typical communication process
1	Numeric pages	Nurses page physicians, and physicians respond by calling back to a telephone number.
2	Alphanumeric pages, Smartphones	Nurses send text messages to physicians' pagers. If necessary, physicians would call back using their smartphones and/or landline phones.
3,4	Smartphones, intranet-based messaging system	Nurses use the intranet-based messaging system to send messages to physicians' smartphones. Physicians respond by email or call back using the smartphones.
5	Intranet-based task-management messaging system that queued non-urgent messages.	Nurses enter a text-based message using the intranet-based messaging system, and physicians are notified on their pagers of a new message, which can be read on the same system. Physicians reply using the task-management messaging system.