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Examining barriers to healthcare providers' adoption of a hospital-wide electronic patient journey board

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ABSTRACT

Background: The dynamic environment that characterizes patient care in hospitals requires extensive communication between staff. Electronic status board applications are used to improve the flow of communication in hospitals. To date there has been limited work exploring the adoption of these applications in general acute ward settings.

Aim: This study aimed to identify barriers to the adoption of an electronic patient journey board (EPJB)[1] application in acute wards of a hospital.

Method: Data were collected at a large public teaching hospital in Sydney, Australia. The EPJB was implemented across all hospital wards with the aim of improving multidisciplinary communication in wards. Observations (29.5 h) and contextual interviews (n = 33) with hospital staff were conducted in two acute wards of the hospital.

Results: Two manual whiteboards were used on wards, in addition to the EPJB, to compensate for information not being available or accessible on the EPJB. Despite the stated purpose of the EPJB, the tool did not appear to support team communication on wards. Barriers to adoption and optimal use of the EPJB included inappropriate location and configuration of the system, limitations in information timeliness, quality and lack of customisation (for different user groups), inconsistent information updates and the absence of a shared understanding of the purpose of the EPJB among the various user groups.

Conclusion: Multiple socio-technical barriers influenced uptake and optimal use of the EPJB by healthcare providers. Engaging users early in the design and implementation of electronic status board applications is required to ensure effective use of these complex interventions on general wards.

1. Introduction

Healthcare is characterized by complex processes of patient care which require extensive communication among healthcare providers [1,2]. Information needed to provide appropriate patient care is often recorded in several places across various mediums. Thus, healthcare providers can spend a lot of time gathering information, which may not always be easy to locate [3].

Over the last few decades, manual dry-erase whiteboards have been readily used in healthcare settings to improve the information flow between care providers. These whiteboards have become ubiquitous tools in hospitals to facilitate communication and coordination of care, especially within Emergency Departments (EDs) [4,5]. The information on whiteboards is typically structured in a matrix-like format, displayed in a central location [4,6,7], and includes patient demographics, caregiver assignments, multidisciplinary referrals, status of tests, and discharge planning.

With the increasing penetration of information technology in healthcare settings, there has been a transition from use of manual dry-erase whiteboards to electronic whiteboards, also referred to in the

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[1] Electronic Patient Journey Board (EPJB).

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Fig. 1. Example View of Electronic Status Board in an ED [p. 1034, 26].

literature as electronic status boards and electronic patient tracking systems [8,9]. These electronic status boards often contain the same matrix format, structure and content as manual dry-erase whiteboards [4], however they overcome a number of limitations of manual whiteboards, including space, loss of information after deletion, no integration with other clinical information systems and the inability to communicate updates in real-time [10]. Status board applications are typically positioned on large wall mounted visual display screens and provide users with the capacity to interact with the system primarily via keyboard and mouse (for example Fig. 1) [20–26]. Some studies, conducted within the context of EDs, report that electronic status boards also have interactive touch screens for enhanced user interactions [15,16,22].

The users of these electronic status board applications range from administrative staff, to nurses distributing work assignments and reviewing patient status, to doctors and allied health staff retrieving and discussing patient information. Electronic status boards must therefore support teamwork as well as individual use [2,11].

To date, EDs and intensive care units (ICUs) have been the primary implementation environments for electronic status and whiteboard applications. Several studies have investigated the effect of electronic status boards on work processes in these settings and reported mixed results [11–17,21–22]. Patterson et al. used ethnographic observations to explore the use of electronic whiteboards in two EDs in the US [11]. They found that only three of the 23 participants used the electronic whiteboard, while all participating physicians used the manual whiteboards. Clinicians with an administrative role appeared to use the electronic whiteboard more extensively than those less involved in patient administration [11]. In another study, time and motion, and primary task analysis were used to examine physician behavior in the presence of an electronic whiteboard [14]. It was found that electronic whiteboard was readily used in the ED and the physician interaction with the electronic whiteboard represented 19.3% (n = 396) of all clinical tasks observed during the study [14].

Some studies have also reported negative effects of electronic whiteboard implementation on the ED workflow. For example, several user-interface issues (e.g. size of information fields) that limit optimal use of electronic whiteboard were identified via administration of a pre-post implementation survey with users at two EDs and a paediatric department in Denmark [16]. Lack of flexibility has also been identified as an issue with the electronic whiteboard applications, as opposed to the manual dry-erase whiteboard where information can be adjusted to time and preference [11].

Despite mixed outcomes on adoption and success in EDs, many hospitals are now moving towards increasing the scope of electronic status board implementation to all wards of the hospital [12,17]. One hospital that did this in 2013 was a large metropolitan teaching hospital in Sydney, one of the first hospitals in Australia to introduce an electronic patient journey board (EPJB) across all of its inpatient wards. The key purpose of the EPJB was to facilitate team communication within wards and improve the efficiency of key hospital processes like discharge planning. However, since its introduction there were anecdotal reports of limited uptake of EPJB by staff on hospital wards. This motivated an examination of the reasons for the limited adoption. The aim of this study was to examine the adoption of an electronic patient journey board in acute wards of a hospital and to identify any barriers to its adoption and optimal use. We were also interested in identifying any barriers that were specific to the acute ward setting, as there has been limited work examining this context of use.

2. Methods

2.1. Research setting

The study was conducted in a large teaching public hospital in metropolitan Sydney, Australia. Two acute wards (ward 1: medical and surgical, ward 2: medical ward) that had used the EPJB application since 2013 were approached and invited to participate in the study. The wards were selected purposively, as the staff members on one ward were perceived to be adopting the EPJB as intended, and staff on the other were not.

Ward 1 has 56 staff members consisting of 8 doctors and 48 nursing staff members. Ward 2 has 20 staff members consisting of 6 doctors and 14 nursing staff members. Allied health staff work across different wards on an as required basis.

The hospital has a number of information systems in place, including electronic test ordering and reporting, medication management, paging, rostering and clinical documentation. Patient progress notes were not electronic.

2.2. Study design

A contextual inquiry approach, using non-participant observations and contextual interviews, was used to collect data for the study, where users of the EPJB were observed and interviewed during their routine work activities. The conceptual basis of contextual inquiry was well suited to this study because it offers the ability to conduct an in-depth examination of users' interactions with artefacts within their work context [18]. The users of the EPJB (i.e. doctors, nurses, nurse unit managers (NUMs), the nurse manager and allied health staff) were observed and interviewed to explore their perceptions of the role of the EPJB to support their routine work and potential barriers to optimal usage. Principal observations and interviews were carried out in the medical workroom where the EPJB was displayed on a large screen. Some supplementary observations and interviews were conducted at workstations and working areas on the wards. In addition, various artefacts (e.g. business documents, manual whiteboards etc.) related to the use of EPJB and mentioned by interviewees were also examined to further provide clarity around data collected during observations and interviews.

Ethics approval was obtained from the hospital's human research ethics committee (HREC) and informed written consent was obtained from all participants in the study.

2.3. Data collection

An initial information session (2 h) with one of the nurse unit managers who was actively involved in EPJB implementation facilitated in understanding why the EPJB had been implemented and the context of use. During the session, a business document describing the purpose and rules for updating the EPJB was shared with the research team to facilitate understanding of the various user groups and their role in maintaining the information within EPJB. Based on the information session, a research team meeting facilitated in identifying the key dimensions of data collection. To identify barriers to optimal use of EPJB on wards, data collection focused on the following three main