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Research Paper

Usability evaluation of a commercial inpatient portal

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ABSTRACT

Objectives: Patient portals designed for inpatients have potential to increase patient engagement. However, little is known about how patients use inpatient portals. To address this gap, we aimed to understand how users 1) interact with, 2) learn to use, and 3) communicate with their providers through an inpatient portal.

Materials and methods: We conducted a usability evaluation using think-aloud protocol to study user interactions with a commercially available inpatient portal – MyChart Bedside (MCB). Study participants (n = 19) were given a tablet that had MCB installed. They explored MCB and completed eight assigned tasks. Each session's recordings were coded and analyzed. We analyzed task completion, errors, and user feedback. We categorized errors into operational errors, system errors, and tablet-related errors, and indicated their violations of Nielsen's ten heuristic principles.

Results: Participants frequently made operational errors with most in navigation and assuming non-existent functionalities. We also noted that participants' learning styles varied, with age as a potential factor that influenced how they learned MCB. Also, participants preferred to individually message providers and wanted feedback on status.

Conclusion: The design of inpatient portals can greatly impact how patients navigate and comprehend information in inpatient portals; poor design can result in a frustrating user experience. For inpatient portals to be effective in promoting patient engagement, it remains critical for technology developers and hospital administrators to understand how users interact with this technology and the resources that may be necessary to support its use.

1. Background and significance

Patient portal, is defined as "*a secure online website that gives patients convenient 24-hour access to personal health information from anywhere with an Internet connection*" [1]. Distinct from conventional personal health records (PHR) [2,3], patient portals are owned and managed by the health care organization to provide most current data for patients [1,4]. As patient-centered care is promoted across the nation, patient portals play an important role in facilitating patient engagement and encouraging patients to take control of their own health, as well as improving patient-provider communication [5–7]. Features provided in patient portals include checking lab results, scheduling appointments, refilling medications, obtaining referrals, accessing educational materials, sending secure messages to providers, and paying bills [7,8]. Both patients and providers were positive about patient portals; however, usability has been reported as a major obstacle for adoption [5,9,10].

Patient portals have predominantly been available to outpatients [11]. Recently, usage and research has been moved to the inpatient setting. Given that currently 68.0% of U.S. adults have smartphones and 45.0% of adults have tablets [12], offering commonly used Android or iOS operated tablets allows inpatients to access their health records during their hospital stay [6]. A variety of inpatient portals have been developed and assessed for their feasibility and benefits for inpatients. Fifteen studies have evaluated the effectiveness of eleven unique inpatient portals (Table 1). Among them, four were ongoing studies without findings yet [13–16]; eleven reported positive patient experiences [10,17–25], including increased patient satisfaction [10,17,19,20,23,25], increased patient engagement [20,21], decreased anxiety [17,20], increased ownership of their own health condition [17,20,23,25], and improved safety and quality of care. [17,23], However, while most features generally received positive feedback, there were mixed opinions regarding communication with health providers via the messaging feature in the inpatient portal [17,18,23], and with a low usage rate (5.6%) [23]. One study reported a high usage rate (72.9%) of the messaging function, but they did not specify when and how the messaging function was used [26].

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Table 1
Feature Comparison of Selected Studies.

	Schedule Appointments	Test Results	Discharge information	Care Team	Medications	Notes	Education	Messaging	Schedule	I would like/ Requests	Allergies	Dining/Diet	Vital signs	Hospital Map	Pay Bills	Clinical Trial Participation	Search for Physicians
BMT roadmap [14,27]		x	x	x	x	x	x	x				x		x		x	
Electronic bedside communication center [24]		x	x	x	x	x	x		x			x					
Health Feed [20]		x		x	x												
Personal Health Record [13] (ongoing study)		x		x	x	x					x	x	x				
Powerchart [21,22]		x		x	x				x		x						
My NYP Inpatient [17–19]	x	x	x	x	x	x	x	x			x				x		x
MyChart [15] (ongoing study)	x	x			x			x									
MyChart Bedside (Wisconsin) [23]		x		x	x	x	x	x	x	x	x		x				
MyChart along with Educational Modules [10]	x	x			x		x	x									
MyChart Bedside (St Rita's Medical Center) [25]		x		x	x	x	x	x	x	x	x		x				
MyChart Bedside (The Ohio State University Wexner Medical Center) (ongoing study) [16]		x		x	x	x	x	x	x	x	x		x				