

Inpatient satisfaction and usage patterns of personalized smart bedside station system for patient-centered service at a tertiary university hospital



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ABSTRACT

Objective: Bedside stations, also known as bedside terminals, are in place to enhance the quality and experience of a hospital's healthcare service delivery. The purpose of this study was to identify information needs and overall satisfaction with the personalized patient bedside system, called Smart Bedside Station (SBS) system, embedded in a tertiary general university hospital.

Methods: End-user responses on the satisfaction survey and system usage logs of the SBS system were collected and analyzed. For the user opinion survey, 156 nurses and 1914 patients, their family members, or caregivers participated during the evaluation period of 2013 to 2014 in this study. All working nurses in the SBS-installed ward were answered the paper-based evaluation, for complete enumeration survey. Inpatients were voluntary participated to deliver the online questionnaire on the SBS menu. We also explored system log data including page calls and usage time from December 2013 to 2015.

Results: Regarding the relationship of overall satisfaction of the SBS with patient's characteristics, patient's education status and degree of familiarity with the smart device were statistically significant. From the analysis of system logs, Personalized My Menu(28.0%) was the most frequently used menu item (except for TV and Internet entertainment service use of 62.7%),it provides individual health information, such as laboratory test results, hospital fee check, message logs, daily medication information, and meal information. Next frequently used menus were information support(4.9%) which deliver hospital guide and health information and convenience service ordering(4.4%) such as meal order, bed sheet change. Satisfaction survey results and log data results show that the personalized service enhances the user satisfaction during hospital admission.

Conclusions: Our post-implementation experience and subsequent assessment of SBS system is capable of providing insights into improving the hospital information system and service contents for patient-centered services. Further research should be directed at developing sophisticated patient-centered services as a communication tool between the hospital and the patient.

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1. Introduction

Along with the increases in technological development, such as mobile devices and related applications, high-performing bedside terminal devices with numerous features have been introduced

for hospitalized patients [1,2]. The design of such devices takes into account performance, content quality, and user-friendliness and is based on the user experience. A new generation of "smart" bedside terminals is enabling hospitals to become fully connected, accessible, and integrated all the way to the point of care [3]. A primary objective of bedside terminals is to enhance the quality and experience of a hospital's service. Patients and healthcare providers often lack real-time access to information at the bedside required to provide safe patient-centered care. Bedside terminals can support information requirements in daily routines through real-time

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access, as well as support bedside communication in acute care hospital settings [4].

Health information is increasingly being sought out for by the public as the number of information sources and services grows [5]. As partners in the advancement of health information and communication technology, health consumers, and their information behaviors have become a key component of the health informatics domain [6]. Research has focused on user preferences and health information seeking. Within the context of user skills and knowledge, technology-related activities have been heavily discussed as a facilitator of information seeking [7]. It is believed that health information accessible through electronic tools has little value if individuals lack adequate skills to use these tools effectively. A review of studies on barriers to and facilitators of electronic health record (EHR) systems found that each group of users had a unique perspective on the implementation process that needed to be taken into account, and the study also highlighted important similarities between groups [8].

To best support health workers in their everyday work, hospital EHR systems should allow for interaction with the patient's health information at the point of care [9]. In this study, we evaluated the patient's bedside terminals integrated with EHR system that support patient's information access and communication with healthcare providers. The purpose of our research was to identify the essential end-user response that will be used to enhance the bedside terminal and to derive information needs and overall satisfaction in real clinical setting.

2. Methods

2.1. Study site and study design on the SBS system

This study was performed at Seoul National University Bundang Hospital (SNUBH) located in the Seoul metropolitan area of Korea. SNUBH is a tertiary general university hospital that was founded in May 2003 as a digital hospital equipped with a fully paperless com-

prehensive electronic health record (EHR) system [10]. The hospital has 1340 beds and has over 5000 daily outpatients. As the hospital had a full EHR system, the bedside terminal, called Smart Bed-side Station (SBS) system was partially adopted in 2013 to support patient-centered healthcare service. With the system, we assessed information needs and service functions personalized to individual patients. SBS page calls, usage time, and user satisfaction survey results were analyzed in this study. In addition, a user survey was performed with both patients and nurses to assess their subjective degree of satisfaction with SBS and collect their opinions.

Survey participants were recruited from a variety of departments, including pediatrics, rehabilitation medicine, neurology, hematology-oncology, otorhinolaryngology, urology, neurosurgery, and ICUs. For the user opinion survey, 156 nurses and 1914 patients/family members participated in the study. All working nurses in the SBS-installed ward from October 21 to November 1, 2013 were answered the paper-based evaluation survey, and inpatients were asked to take the on-line questionnaire from December 2013 to 2014 (12 month). For patients, each participant was voluntary participated to deliver the online questionnaire on the SBS menu, while the paper survey for complete enumeration survey was given to nurses. A total of 2070 questionnaires were returned, and 2000 questionnaires were valid for data analysis. Data for those who submitted incomplete answers to questions were eliminated. Fig. 1 shows the overall methodology of this study.

2.2. Description of the SBS system

The key services feature list of the SBS is presented in Table 1 [2]. The four major categories of the SBS menus were following: [1] convenience services that provide meal ordering, service ordering, and proof application form issue; [2] entertainment services for watching TV or browsing the internet; [3] information support for hospital information and a hospital guide; and [4] a personal menu, which displays a customized page for individual patients. Known as "My Menu," this page contains various contents such as lab test

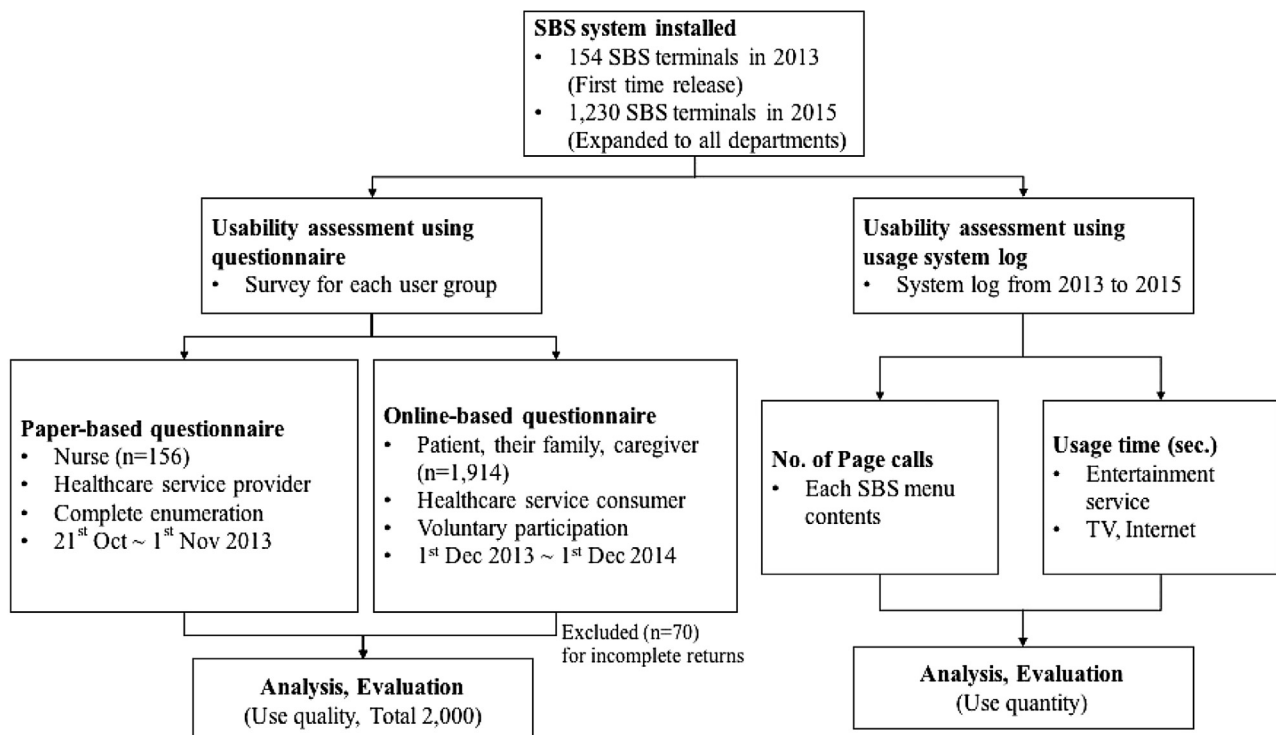


Fig. 1. Overall study design.

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