Utilizing Emerging Technologies to Promote more Efficient Face-to-face Patient – Clinician Communication

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UbiComp '13, September 08 - 12 2013, Zurich, Switzerland

http://dx.doi.org/10.1145/2494091.2497362

Abstract
In literature there are different projects showing how new information and communications technology (ICT) systems can be used for enhancing communication between and among patients and clinicians over Internet. Besides advantages these systems offer to both patients and clinicians there is also great concern that utilizing new technologies can limit and negatively influence patient-clinician face-to-face communication. This paper underlines these concerns and describes two projects in our research center that promote more effective offline patient-clinician communication.

Author Keywords
Communication technologies; healthcare information systems; patient-clinician communication.

ACM Classification Keywords
J.3 Life and medical science: Health; H.4.m Information systems applications: Miscellaneous.

Introduction
Due to higher demand for healthcare personnel and increasing costs related to health and long-term care, there is increasing need for innovative methods and approaches for promoting more efficient interaction and

Figure 1. Choice ITPA (Interactive Tailored Patient Assessment) tablet PC application

collaboration between patients and healthcare providers. Different research shows that effective communication between patients and clinicians is one of the key factors influencing good outcomes of patient care and compliance to treatment [1].

A growing body of work focuses on developing ICT systems that support online patient-clinician communication over different usage scenarios. One example is systems that support asynchronous communication outside of clinical settings such as SMS, email, mobile health applications, and patient portals. Other example is emerging Electronic Healthcare Records and Personal Healthcare Records that can gather different patients' data in one place and provide easy access to information at the point of need for both healthcare personnel and patients. These systems are usually used for enabling more effective monitoring of patients and exchanging of follow-up and educational information while outside of clinical settings, and more efficiently reporting and accessing of healthcare data during and between clinical visits.

However, face-to-face communication is still primary and most important type of interaction and communication between patient and clinician, and the raising question is how utilization of ICT technologies in patient-clinician online communication influences communication during clinical visits. There is different research reporting that the main barrier for patients to accept new technologies as part of healthcare information systems is concern that their utilization will limit face-to-face communication with healthcare providers [2]. Additionally, some research report that patients find utilization of computers during hospital visits affect the time physician spend talking and examining them and result in making the visit feel less personal [3]. Much better acceptance is reported for systems that enable joined patient-provider interface where both parties can together preview and discuss the displayed information [4]. Besides patients, clinicians often show negative opinions regarding adoption of new and advanced technologies in clinical practice. One of the main reasons is that the new technologies are usually perceived as additional work, rather than a mean to enhance efficiency of existing work process [5]. For example, new ICT systems usually require clinicians to: process additional data, learn how to use new technology, and/or learn to improve existing or gather new communication skills [6]. Some studies also report that a large number of physicians feel that using ICT systems in clinical settings disturb communication with patients [7].

So, the main challenge when designing and developing ICT systems for healthcare is to make sure they do not limit and negatively influence existing patient-clinician communication, but to fit in the existing context and enhance communication flow. In the next section we will describe two systems developed in our research center with the goal to support collaboration and information sharing between and among patients and care providers in online and offline communication.

Choice system

The Choice ITPA (Interactive Tailored Patient Assessment) is a touchpad tablet PC application designed to help cancer patients in preparation for a consultation with a clinician to communicate their symptoms, problems and concerns (Figure 1). The application enable patients to select, prioritize and rank their problems according to need for symptom

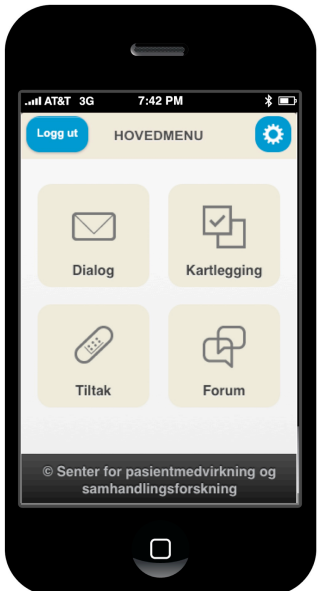

Figure 2. Connect mobile application

management support prior meeting with clinician. When patient finish assessment, the system creates an assessment summary that provides support to clinicians in providing individually targeted symptom management support. The goal of the Choice tool is to provide support for more patient-centered, illness-related consultations and help clinicians to better address a patient's individual symptoms and concerns.

Connect system

Connect system is a patient portal that integrates a suite of Internet-based tools designed to support cancer patients in illness management. The system incorporates a series of modules designed to support patient-provider communication, collaboration and shared decision making in different online and offline environments (hospital, outpatient clinic, and patient's home). Using the system patients can monitor their symptoms, obtain individually tailored evidence-based self-management support, ask questions to a clinical nurse specialist, communicate with other patients in a forum, and use a diary. The access to the system is enabled over both web and mobile application (Figure 2), enabling access to the healthcare information over different contexts (e.g. home, hospital). By providing patients with around the clock access to important health information, the goal of the Connect system is to help patients better understand and manage their illness, become more engaged in their own health care, and improve communication with care provider.

Discussion

Previous examples show two ICT systems designed to empower patients to take more active role in health management and decision-making process and promote patient-centered care through enhancing both online and offline patient-clinician communication. Choice system shows how ICT systems can be used in clinical settings to promote and assist more efficient face-to-face communication regarding patient's symptoms. In Connect system the focus is on enabling patient's online management of health symptoms and problems, and these data can be afterwards used for improving patient-clinician offline communication during hospital visits. The results of conducted clinical trials on both systems shows that this kind of systems can be used to: improve patient-centered care and reduce both symptom distress and patients' need for symptom management support; improve symptom self-management, symptom distress, quality of life, and emotional well-being of patients; engage patients to become more informed and active during face-to-face communication [8-10].

Low acceptance of emerging ICT systems by patients and healthcare providers is one of the main issues when designing and deploying new systems and services in healthcare information system. The best way to address this issue is by involving different stakeholders during system design and development process and in this manner make sure that the future system functionalities and design will fulfill users requirements and expectation. On one side, patients' perspectives and motivations must be captured and addressed through system design. On the other side, clinicians' adoption, acceptance and sustained use must be carefully considered, making sure that the system does not impose extra work on the clinicians part, and provide evidence for improved patient treatment and care. For this reason, during development of described projects different user-centered and participatory design methods were organized (workshops, focus

groups, usability testing) and different system stakeholders were included in the process [11-13].

Conclusion

In this paper we shortly described the main issues related to how emerging ICT systems and services can influence face-to-face patient-clinician communication. Through examples of two projects in our research center, we showed how emerging technology and online systems could be used to enhance offline communication and promote patients engagement in their own health care management process.

Acknowledgements

This work was supported by The Research Council of Norway under Grant Flexible Collaborative Networks and Patient Provider Partnership in Health Care.

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