Sharing clinical decisions for multimorbidity case management using social network and open-source tools

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ABSTRACT

Introduction: Social networks applied through Web 2.0 tools have gained importance in health domain, because they produce improvements on the communication and coordination capabilities among health professionals. This is highly relevant for multimorbidity patients care because there is a large number of health professionals in charge of patient care, and this requires to obtain clinical consensus in their decisions. Our objective is to develop a tool for collaborative work among health professionals for multimorbidity patient care. We describe the architecture to incorporate decision support functionalities in a social network tool to enable the adoption of shared decisions among health professionals from different care levels. As part of the first stage of the project, this paper describes the results obtained in a pilot study about acceptance and use of the social network component in our healthcare setting.
Methods: At Virgen del Rocío University Hospital we have designed and developed the Shared Care Platform (SCP) to provide support in the continuity of care for multimorbidity patients. The SCP has two consecutively developed components: social network component, called Clinical Wall, and Clinical Decision Support (CDS) system. The Clinical Wall contains a record where health professionals are able to debate and define shared decisions. We conducted a pilot study to assess the use and acceptance of the SCP by healthcare professionals through questionnaire based on the theory of the Technology Acceptance Model.
Results: In March 2012 we released and deployed the SCP, but only with the social network component. The pilot project lasted 6 months in the hospital and 2 primary care centers. From March to September 2012 we created 16 records in the Clinical Wall, all with a high priority. A total of 10 professionals took part in the exchange of messages: 3 internists and 7 general practitioners generated 33 messages. 12 of the 16 record (75%) were answered by the destination health professionals. The professionals valued positively all the items in the questionnaire. As part of the SCP, opensource tools for CDS will be incorporated to provide recommendations for medication and problem interactions, as well as to calculate indexes or scales from validated questionnaires. They will receive the patient summary information provided by the regional Electronic Health Record system through a web service with the information defined according to the virtual Medical Record specification.
Conclusions: Clinical Wall has been developed to allow communication and coordination between the healthcare professionals involved in multimorbidity patient care. Agreed decisions were about coordination for appointment changing, patient conditions, diagnosis tests, and prescription changes and renewal. The application of interoperability standards and open source software can bridge the gap between

knowledge and clinical practice, while enabling interoperability and scalability. Open source with the social network encourages adoption and facilitates collaboration. Although the results obtained for use indicators are still not as high as it was expected, based on the promising results obtained in the acceptance questionnaire of SMP, we expect that the new CDS tools will increase the use by the health professionals.

1. Introduction

Social networks applied through Web 2.0 tools have gained importance in health domain [1], because they produce improvements on the communication and coordination capabilities among health professionals. The previous experiences identified about the application of social networks and Web 2.0 tools for the management of illnesses have focused on the improvement in medical professional–patient communication or self-management of illnesses by patients. These experiences identified benefits for patient healthcare [2,3], and aspects to improve usability, privacy and encouragement of use [4,5].

These tools may be complemented with Clinical Decision Support (CDS) utilities, designed to help clinical professionals in the decision-making process, improving the quality and security of healthcare [6–8]. Although decision support tools are recognized as key instruments for improving patient safety and facilitating the adherence to recommended clinical practice, their adoption is not generalized in health information systems.

This article presents the development of a Web 2.0 tool which facilitates healthcare professionals' treatment and care of multimorbidity patients. These patients are defined as having two or more chronic illnesses from a series of clinical categories, which generate a progressive deterioration and gradual loss of autonomy, combined with the risk of suffering different interrelated pathologies.

The World Health Organization forecasts that the percentage of deaths from the main chronic illnesses in the world will increase in the period between 2004 and 2030 from 12.2% to 14.2% for ischemic cardiopathy; from 9.7% to 12.1% for cerebrovascular disease; from 5.1% to 8.6% for chronic obstructive pulmonary disease; from 1.9% to 3.3% for diabetes mellitus and from 1.7% to 2.21% for hypertensive cardiopathy [9].

Previous studies have demonstrated the characteristics and complexity of these patients [10–12] and provide a solid argument for the development of a tool to support shared care between the different healthcare levels that these patients need. In Virgen del Rocío University Hospital (VRUH), the Internal Medicine Department coordinates the continuity of care for multimorbidity patients since 1992, with an integrated care model that specifies who is the internist and nurse in the hospital responsible for continuity of care for each primary care center and establishes a periodic assessment plan for multimorbidity patients to make possible to determine the evolution in cognitive, functional and health status of these patient. This model has was supported previously only by telephone conversations and face-to-face meetings [13].

Our objective is to develop a tool for collaborative work among health professionals for multimorbidity patient care. We describe the architecture to incorporate decision support functionalities in a social network tool to enable the adoption of shared decisions among health professionals from different care levels. As part of the first stage of the project, this paper describes the results obtained in a pilot study about acceptance and use of the social network component in our healthcare setting.

2. Materials and methods

At VRUH we have designed and developed the Shared Care Platform (SCP) to provide support in the continuity of care for multimorbidity patients.

2.1. Platform design

The SCP has two consecutively developed components.

2.1.1. Social network component: Clinical Wall

The SCP has been developed to allow communication and coordination between the healthcare professionals involved in multimorbidity patient care. The first available component has been designed to support the work at different healthcare levels, such as Primary, Specialized and Home Care, which are involved in the care of multimorbidity patients.

The SCP has an option for generating records to support the dialog between professionals using social network technologies. We have called it the Clinical Wall due to its similarities with conversations in the wall of a social network website. When two or more professionals need to discuss a patient's care, they can start a conversation in the Clinical Wall. This component makes it possible for healthcare professionals responsible for a patient's care to exchange messages, until they agree on conclusions or final decisions. If the healthcare professionals taking part in the Clinical Wall decide that the opinion of another colleague is required, they can invite these experts to join the conversation and contribute with their clinical expertise. These conversations are linked to the patient's record as additional information to support changes in the treatment plan or care showing on the left side of the screen a tree of folders containing all the documents related to the patient. The record is composed from the following sections:

- Patient assessment section: In this section any healthcare professional starts the dialog with a clinical question (clinical sender). This question will be accompanied with additional information such as patient evolution, examination, complementary tests, treatment plan and current clinical assessment, to provide an exhaustive patient clinical context for colleagues. The question will be directed towards one specialist whose expertise is related with the information required (clinical receptor). In addition, the set of actors involved in the continuity of care process defined for multimorbidity patients are: General Practitioner (GP), primary care nurse, internist and Hospital nurse. Automatically, they will be included in the conversation in order to let them add relevant information, if required.
- Discussion section: This section acts like a forum where the previously included health professionals will be able to provide the information and arguments to make a decision.
- Conclusions section: Once clinical question sender and receptor agree on their conclusions and future actions for patient care they have to sign it as a shared decision.