Mental Health Engagement Network (MHEN)

Connecting Clients With Their Health Team

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Abstract— **This research study introduces, delivers, and evaluates the benefits of using web and mobile technology to provide consistent supportive health care to individuals living within the community who have been diagnosed with a mental illness. This longitudinal, mixed method study will consist of 400 individuals who have been diagnosed with either a mood or a psychotic disorder who are currently working with mental health care professionals in the community. The participants will have access to a personalized health record and applications related to their care plan on a smart phone. It is hypothesized that the use of smart technologies in the treatment of mood and psychotic disorders will improve quality of life while reducing health care costs through a reduction in hospitalizations and hospital room visits. Baseline findings will be available in May 2012.**

Keywords- Smart technology; Mental Health Care; Personal Health Records; Quality of Life; Health Care Costs

I. INTRODUCTION

The economic cost of mental illness to Canada was recently estimated at $51 billion annually, and still the current "system" of care is fragmented and without sufficient resources (financial, human, and technological), per "The Healthcare Interview" Canadian Healthcare Network, December 2009 [1]. The 2009 estimations showed a dramatic increase from 2003, when it was estimated that the Canadian economic burden due to mental illness was ~ $34 billion ($1,056 per capita), which was a 3-fold increase from 1998 estimations of $12.3 billion. Twenty percent of Canadians will personally experience a mental illness in their lifetime and most others will experience mental illness indirectly through a family member, friend, or colleague. Mental illness affects people of all ages, regardless of education, income level, or culture [2]. With mental health services being at a crisis point, even though billions of dollars are being invested to help, most people in need of care will not receive the care they need [3].

Commonly, mental health care is prioritized for individuals with the most severe symptoms, due to the lack of available services. This runs counter to the general health care system where prevention and intervention at less serious levels is the norm. The current way of treating psychiatric illness is unsustainable and only through developing new service models that provide support and early intervention, will the mental health care system be sustainable. A new and potentially more sustainable method of providing mental health care would be that of employing smart technologies to enhance the treatment of mental health clients.

Several applications, both mobile and web based, have been developed employing smart technology to support health care. Examples include: My Mood Monitor [4] and MedHelp's Mood Tracker [5], which are both applications designed to monitor a user's mood; medication adherence assistance applications such as RxReminder [6]; the Mobile Assessment and Treatment for Schizophrenia (MATS) [7] which is an interactive text-messaging intervention; and the use of Personal Health Records/Electronic Health Records. However, the effectiveness of these applications has not been extensively researched, particularly within mental health care, nor have these applications ever been utilized in conjunction with each other to provide a holistic care package. This study will be the first of its kind to employ all of these applications in one complete platform while also including the use of personalized care plans which have previously not been utilized in this fashion.

The Mental Health Engagement Network (MHEN) is focused on putting technology in the hands of clients of the mental health system and their clinical team to demonstrate how to more effectively and efficiently deliver health care services. This project will deploy TELUS health space™ consumer health platform along with a customized personal health record application and interactive tools that support a novel way to provide patients with standardized health services, ongoing monitoring and regular communication with their care team. This innovative solution will help coordinate care across the continuum; ensuring that services are more accessible, patient-centered, and promote the empowerment of individuals so they can better manage their own health. From a population perspective, this proposed system re-design will have the capability to reduce or prevent acute episodes of mental illness and reduce the severe pressures on an already over burden health care system.

This document proceeds as follows. Section II describes the methods employed by the MHEN project. The expected outcomes are outlined in Section III and the conclusion is presented in Section IV.

II. METHODS

The following subsections describe the methods of theMHEN project .

A. Study Design

This delayed implementation research study launched in September 2011 and will conclude in November 2013. It includes 50 community mental health providers and 400 research community clients who have been diagnosed with a mood disorder or a psychotic disorder. Clients will be randomized into Group 1 (early intervention) or Group 2 (later intervention). Group 1 (200 participants) will receive a handheld device, a TELUS health space™ account, and version 1.0 of the Lawson SMART record during Phase I. The remaining 200 clients, Group 2, will initially act as a control group, and at Phase II (6 months later) will receive a handheld device, a TELUS health space™ account, and version 2.0 of the Lawson SMART record. Version 2.0 of the Lawson SMART record will be based on the feedback acquired from the care providers and clients in Group 1 who have participated in focus groups. Subjects will be recruited from local community programs and will be randomly assigned to the early or delayed adoption groups.

The specific electronic tools proposed in this project will leverage the use of web and mobile devices to provide cues to support daily structure to individuals. The tools will include self-assessment applications such as mood and medication monitoring. These tools will be linked in real-time to action plans designed by the consumer to be used when assistance is required in relation to their mental health. It is proposed that the action plans be linked with an individual's crisis plan, so prompts (i.e. SMS texts sent directly to the individual's mobile device) can be sent automatically to the individual based on their recovery plan activities. Through the use of communication tools, self-care

will be encouraged and supported, allowing for a sense of empowerment in the consumer. These activities will be managed through the individual's personalized care plan, deployed through TELUS health space™, along with a Lawson SMART record to empower the consumer with their own health care information. This application will provide the consumer with the ability to share their own health care data, securely with their multiple care providers. Care providers will then have the ability to provide treatment based on prior care, so the consumer receives continuity of care. This will allow care providers to avoid costly duplications of tests and interventions that have already been determined unsuitable.

In summary, the present project will introduce, deliver, and evaluate the benefits of empowering consumers with their personal health information, while using leading-edge communication technologies to deliver a more consistent type of supportive care to individuals who most urgently need it.

B. Sample

The 400 client subjects and 50 care provider subjects will be recruited through community programs at London Health Sciences Centre and St. Joseph's Health Care, London as well as through the Canadian Mental Health Association (London-Middlesex Branch) and WOTCH Community Mental Health Services.

C. Data Collection

Individual interviews with client participants will be held during the baseline period and then every 6 months for 18 months. Data collected will include use of mobile devices, perception of usefulness, quality of life, general health, and use of health and social services (including hospitalizations and emergency room visits as well as other services). The knowledge learned through Group 1, over the initial 6 months, will provide baseline and comparative data to understand the client's perceptions for designs and outcome purposes of the technology intervention. Improvements in the technology approaches made during the initial 6 month period will enhance the tools for Group 2. We are expecting different feedback from groups, one to guide development and one to improve what is developed.

Focus groups will take place at multiple points during the study. Group 1 will participate in three focus groups: (1) approximately one month after receiving the handheld device and a TELUS Health Space account to discuss usability and adoption; (2) follow up focus groups will be held two months thereafter to discuss the benefits and pitfalls associated with the technology and to form base recommendations for the next phase of study (Group 2); and (3) 6 months later to discuss future recommendations. Group 2 will also participate in 3 focus groups. They will meet in a similar timeframe: (1) approximately one month after receiving the handheld device and a TELUS Health Space account to discuss usability and adoption; (2) follow

up focus groups will be held two months thereafter to discuss the benefits and pitfalls associated with the technology; and (3) 6 months later to discuss future recommendations. Focus groups with staff/health care providers will also be held so that issues can be identified and addressed quickly.

III. PRELIMINARY RESULTS

Preliminary quantitative data analysis of 123 client subjects (61 men and 62 women) indicates that the mean age of the population is 40.88 (SD = 12.814). The most common psychiatric diagnosis in this sample population are mood disorders (69.1%), psychotic disorders (54.5%), anxiety disorders (41.5%), substance-related disorders (10.6%), personality disorders (8.9%), disorders of childhood/adolescence (7.3%) and developmental handicaps (0.8%). Most client subjects indicated that they have been admitted to the psychiatric hospital at least once (87%) and of those individuals, most have been admitted a mean of 8.83 times (SD = 13.772).

Initial quantitative analysis shows that most client subjects are generally comfortable with the use of technology. Most indicated that they were either extremely comfortable (22.0%) or slightly comfortable (25.2%) with technology generally, while only a minority said that they were either slightly uncomfortable (4.9%) or extremely uncomfortable (5.7%) with technology generally. Despite this general level of comfort, only a minority of participants had regular access to a computer at home (38.2%) and only a slightly larger population (41.5%) owned a cell phone. These findings suggest that client subjects will be receptive to training on the use of smart technologies, but also that they often do not have regular access to smart technologies.

IV. EXPECTED RESULTS

Baseline data will be completed by April 2012 and the training and implementation of the first 200 participants will be conducted in May 2012.. For the conference we will be able to describe the sample and their initial perceptions of technology as well as describing the elements of the programs and training.

The overall hypothesis is smart health information technology (HIT) will improve quality of life and reduce health care system costs. To test this hypothesis we will use an evaluation framework that includes four levels of analysis: effectiveness, economic, ethical and policy. Development and testing of a more cost-effective means of addressing mental health issues will increase the ability to provide the best practice at an affordable cost which benefits consumers and taxpayers.

The current study will be done in a geographical setting that represents a microcosm of environments found across Canada, making research done within this region easily translational throughout Canada. It includes a large integrated mental health focus to evaluate smart technology

within the continuum of care from early intervention (Primary Care; Emergency and Acute Care; Community Integration; Tertiary Care to Rehabilitation). The study will provide an enterprise system solution to support health technology innovations, using mobile technologies and tools that will provide personalized, preventative consumer health care. The system re-design includes privacy security solutions developed by academic health researchers embedding knowledge into novel community based health tools, making tools directly translational for use in health care settings. This will also give researchers and health care providers an understanding of mental health client acceptability to receive personalized care through smart devices which has not been previously explored.

V. CONCLUSION

Preliminary results, including baseline data and initial focus groups, will be available in May 2012. It is expected that the use of smart technologies in the treatment of mood and psychotic disorders will improve quality of life while reducing health care costs through a reduction in hospitalizations and hospital room visits.

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