Mental Health Smartphone Application — A New Initiative for Mental Health Care Providers

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Background & Introduction

- With the improvement in smartphones related technologies, there has also been a massive surge in the number of smartphone applications being developed and made available for downloading. Statistics have also shown a tremendous increase in the number of downloads of smartphone applications, from 300 million in 2009 to over five billions in 2010 [1].

- Previous research studies have also demonstrated the effectiveness of smartphones in healthcare related research - mainly in collection and analysis of patient’s data [2].
Background & Introduction

- With the capacity of geo-positioning (GPS), the use of smartphones to support the implementations of healthcare programs in rural and remote areas, where clinicians could get immediate access to core clinical information has been demonstrated.

- In addition, studies have shown that GPS features would help in monitoring of a whole series of behaviors, and such technologies have been useful in smoking research and treatment [3].

- Moreover, other potential applications of smartphones in healthcare, such as the use of short messaging services to promote desired behavioural change, as well as to improve patient's compliance to medications and various treatment regimen have also been reported [4].
Background & Introduction

- Although the number of healthcare related applications has been increasingly steadily over recent years, the majority are currently limited to providing information, advice, instruction, support, encouragement and to various interactive tools for individuals for monitoring, recording and reflection.
- Based on previous surveys [7] most of the current healthcare applications are targeted at the general public, and not the medical specialist or the primary healthcare provider.
- It is also of no doubt that healthcare applications have far lesser outreach in certain medical specialities, especially at the primary care level. We have identified mental health and psychiatry as particular areas for potential development.
Background & Introduction

- There have been various healthcare applications written to provide basic information about mental health disorders and to track the emotion and mood of users, such as Epocrates, Psych Facts and Depression Monitor on the Apple i-Tunes store.

- Because the current applications largely target the general public, the common limitations in psychiatry are that they fail to provide primary providers with an integrated application that incorporates assessment tools and medical information targeting mainly for physicians. Moreover, they may not provide self-report questionnaires for patients during consultations, to enable physicians to track patient's individualized progress.
As a result, we have proposed this mental health application primarily catering to the needs of primary care providers, in order to help keep primary healthcare providers updated with latest psychiatry knowledge and also to advocate earlier detection and interventions for at risk individuals in the general population.
Methodology

- The Mental Health Wellness smartphone application (MHWell App)

- The web-based smartphone application was developed between January 2012 and April 2012, based on a developmental approach involving five phases: a) formulation of user requirements, b) system design, c) system development, d) system evaluation and e) system application. The details pertaining to each phase of system development are documented below.
The application aims to provide mental health practitioners with basic tools to screen for core mental health disorders, and to provide them with structured questionnaires for patients prior to and during their consultation visits, so that the mental health providers may have insight into the patient's general quality of life and to track patients’ progress in each consultation.

In addition, we have integrated the Patient Reported Outcome Measurement Information System (PROMIS) for patients to fill in during each visit to capture General Quality of Life assessment data, in order for primary care providers to recognize impact of an illness on psychosocial functioning [9,10].
Methodology

- Furthermore the application aims to provide information that is more specialized for primary care providers and aims to enhance the knowledge base of these non-psychiatrically trained primary healthcare providers. The information would be updated regularly to include the latest diagnostic criteria for various psychiatric conditions as well as to incorporate treatment plans according to management guidelines based upon the existing NICE (UK) guidelines.

- Furthermore, psychotropic medication information has also been included in the application for ease of reference, for primary healthcare providers.
Methodology

- The mobile application also enables the integration of resources via a resource locator for providers to know about the sub-specialist services in their areas to allow them to refer patients for other psychological therapies or counseling support, as very often treatment involves both pharmacological and psychological modalities.

- The mobile application also enables health care providers to send mass e-mails and instant messages to remind patients of appointments or relevant workshops or talks for better condition related knowledge or insight.
Methodology

- System prototyping was adopted as our software engineering model. The prototype version was built using an online smartphone application builder utilizing HTML5 codes to program specific features in the application within the periods of January 2012 to April 2012. In addition, an online database management system was also utilized to capture the required data.

- The usability and accuracy of the content was evaluated by an expert group, which comprised of a consultant psychiatrist, a psychiatric resident in training and also an epidemiologist. Each aspect of the smartphone application was repeatedly tested several times to ensure that there are no underlying user-related problems. The robustness of the prototype version was also tested on both the IOS and Android platforms.
Methodology

- In addition, an online qualitative survey was created to access the applicability of the application, by asking a group of second year psychiatry residents (n=6) in training to evaluate the application. This group of psychiatry residents was chosen because they have at least one year as trainees in psychiatry, and have completed core medical and surgical posting within the past year. Therefore, they may be presumed to provide more insights regarding the usability of the smartphone application as they are not yet too sub-specialized.
Assessment Toolkit for Primary Care Providers

Thank you for using our in-house assessment toolkit. This assessment toolkit has been modified based on the well validated Brief Psychiatric Rating Scale. This assessment guide serves as a general guide for the initial assessment of the following symptomatology - Depression & Anxiety. Disclaimer: This assessment toolkit serves only as a general guide. It is not clinically diagnostic. Individuals are still encouraged to seek help from...
Assessment Center

Mental Health Wellness Mobile Application
Individualized Mental Health Wellness
Screening Questionnaire

(please take note of your individualized participant number for record purposes)

If you already have a Login and Password, please enter them in the boxes.

Login

Password

If you are a first time user, click Start below.

If you have any questions or problems, please contact mehynychangwei@gmail.com. If you would like to bookmark this page, click this Add to Favorites link.

Information

- Mood Disorders - Depression
- Mood disorders - Bipolar
- Mood Disorder - Suicide
- Anxiety Disorders
- Anxiety Disorders - OCD
- Psychosis

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Results

- The pilot prototype was recently featured on the technology section of the Hong Kong South China Morning Post in June 2012[11] and it yielded a total of 136 downloads during the week when it was featured. The qualitative online survey yielded a response rate of 50%.
- All the participants felt that it was essential for primary healthcare providers to have access to information in the field. Concerning the importance of information available within the smartphone application, mental health information and medications information were ranked higher than tools like assessment toolkits, resource locators and also the text messaging system to remind patients of crucial events and appointments. Suggestions were given to improve the current application, such as to incorporate medical records information from the electronic medical record database from the local governmental agencies, as well as to further simplify the information for common mental health disorders.
Discussion

- Major challenges in application development

There are several challenges with regards to the development of such an application.

- 1. Meeting the needs of Primary Healthcare Providers
- 2. Selection of an appropriate questionnaire for Primary Care Usage
- 3. Accessibility of Mobile application
- 4. Security and access issues
Discussion

1. Meeting the needs of Primary Healthcare Providers

- We have included the diagnostic questionnaire in order to help primary healthcare providers determine the underlying psychopathology and to help them with their assessment.
- In addition, we have included individualized Patient Reported Outcome Measurement Information System (PROMIS) “General Quality of Life questionnaires, to enable primary care providers to recognize the extent to which an illness has affect psychosocial functioning and to determine to what extent their interventions, whether pharmacological or psychological, have helped during subsequent consultations.
- The advantage this application over current healthcare information applications might be the incorporation of relevant guidelines such as the National Institute of Clinical Excellence (NICE) guidelines, as well as relevant local mental health guidelines, published by local governmental ministries or departments of health.
Discussion

- **2. Selection of an appropriate questionnaire for Primary Care Usage**

There were initial challenges concerning the selection of a questionnaire that would be appropriate for primary healthcare providers to use to help in assessment and diagnosis of a constellation of psychiatric conditions.

- We have included a simplified assessment questionnaire for quick administration in clinic settings.
- We have include the validated PROMIS system to help acquire patient’s general well-being.
Discussion

3. Accessibility of Mobile application

Most smartphone users are using smartphones running on either the Apple IOS or the Android operating system.

Nevertheless, we have tried to create an application that would be capable of running across more different platforms such as Windows mobile and Symbian, to include more potential users.

The prototype model is a web-based application that is able to run across several platforms, inclusive of both the Apple IOS and also the Android platform.
Discussion

4. Security and access issues

- We recognize that the current application could be accessed and downloaded by all members of the general public.
- Because there is specialized medical information within the application, the mental health information and medications resources all require password access.
- Passwords would only be issued strictly to validated primary healthcare providers.
Discussion

- Although the four main challenges have been presented with feasible solutions, the main barrier perhaps would be getting primary care providers to engage and utilize the application in their day to day practice.

- Some primary care providers might be too overwhelmed with their patient load to have the necessary time to administer the questionnaire scales, check out relevant information and counsel patients accordingly.

- There is a possibility that they would do a quick clinical interview and refer the patient over to other mental health specialist services.

- In addition, the majority of the primary care providers currently practising grew up and studied in a decade to which these advances in technologies have not been made available; and hence, there might be resistance towards adopting this application as a clinical tool.
Limitations

- Questionnaire (English language)
- Promoting the usage of such application to Primary Health Care Users – What would the best modality be?
- Limited qualitative feedback (due to small cohort size in the local context)
- Reluctance of older generation physicians to utilize newer modalities of technologies
Conclusions

- The development of the Mental Health Wellness application demonstrates how applications could potentially help to enhance primary health care intervention and prevention by targeting mainly primary healthcare providers.
- There are unique functionalities within the application that enables patients to engage in the process of seeking consultation from their primary care providers, thus providing more comprehensive psychiatric assessment.
- We acknowledge that our current evaluation is limited, due to the small sample size.
- It is hoped that the development of the MHWell application could continue and be further evaluated amongst the targeted group of primary care providers, and if proven successful, it would serve as the foundation and basis from which more healthcare related applications could be developed for health care providers involved in primary prevention of common chronic illnesses. The key reason to build the current prototype is to demonstrate the feasibility of building an application catered for primary care providers.
A handy tool for assessing your state of mind

Katie McGregor
healthpost@scmp.com

Mental Health Wellness
Free
Rating 7/10

The authors of this app, Dr Melvin Zhang, National Healthcare Group, Singapore and Dr Mak Kwok-kei of the faculty of medicine at Chinese University of Hong Kong, say that mental health disorders are becoming increasingly prevalent.

These disorders are unique because there are no diagnostic tools to ascertain whether one has a particular disorder, they say.

This app serves as a diagnostic tool for frontline health workers such as doctors and nurses. There are detailed breakdowns of various mental illnesses and information on suitable medication for psychotic disorders.

I avoided this section and browsed through the basic mental health wellness tools that are basic English. They include a calculator for calculating your mood and stress levels.

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Collaborations?

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Online CBT for Bariatric Surgery Patients

This online portal is part of a research study on Cognitive Behavioural Therapy for bariatric surgery patients.

We hope this 6-session treatment plan will help you take care of yourself after bariatric surgery.

What are our goals?

- To discuss the reason we use cognitive behavioural therapy (CBT)
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- To discuss different types of treatment
Thank you