Internet-Based Depression Interevetion Applications

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Introduction

Studies have showed that adolescent, especially age around 18 as university students, are people who have high risk to experience depression symptoms (around 20%). This may cause by high pressure from universities. However, only a few of them might receive proper treatment.

We are the group peach working on a project based on Android platform, to prevent depression among university students and help them seek for diagnosis if needed. Whether our application will be helpful for those young people who are suffering from mental health disorders, will it be harmful (like might hinder the normal therapy)? What features could be implemented in our application, these are the significant questions that we might concerns early in our program.

Therefore, in order to understand how technology may have effects on preventing depression, monitoring mental health states and treatment for mental health disorders, also to identify the potential problems that user may have

Bibliography

Literature 1: We can manage depression better with technology

In this article, the author introduced the non-drug treatment for depression. More and more people begin to believe that antidepressants may not be the best treatment for depression, especially for mild and moderate depressive disorder. Therefore, Internet-delivered cognitive behavior Therapy (iCBT) is an option besides traditional medicine treatment. The author briefly introduced (actually ask the provider to describe their program) three iCBT programs.

According to the author, traditional medicine treatment may have harmful side effect to patients, especially for those mild to moderate mental health disorders. Compare to the medicine treatment, CBT could be delivered by the internet, which is much more convenient and economy-friendly, according to the data provided by the iCBT provider, no harm is reported.

Based on the description from the provider, we can see that iCBT involves tasks and lessons given to the user, self-assessment, monitoring and alert, frequent contact with the psychologists (mainly by video conferencing, instant messages, emails and voice mails). Same as the traditional treatment, psychologist still play a significant role in iCBT program, which ensure the professionalism. The result also indicates that it proved to be effective to most of the users.

This article is important to our project because it showed that face to face therapy is not the only solution for depression treatment, internet based, or even mobile application could also be a platform for depression therapy. This could help us identify the features of consultation in our application. Besides simple contact with the counselor, is there any treatment could be delivered via our platform, this could worth consideration.

Keywords: mental health disorders, antidepressants, side effect, Internet-delivered Cognitive Behavior Therapy
Insights: medication might not be very useful on mild and moderate depression and also have harmful side effect; iCBT could be a more convenient and effective solution for depression.

Literature 2: Understanding adolescent response to a technology-based depression prevention program.

This article introduced an internet-based online depression prevention program facing adolescent age from 14-21. According to previous research, 20% of the teenagers might experience a depressive episode by age 18. Most of these adolescents couldn't receive complete or proper treatment or couldn't totally recover from the disorders. Under this situation, depression prevention for adolescents are clearly to be important.

Technology based interventions could be widely found through the Internet and proved to be effective, however, very few researches were conducted concerning the factors that contribute to its efficacy.

The author conducted a research to seek for these factors which could be important to guide future designs. The research involves participants (N=83) age from 14-21, more than half is female, from different races. They were involved in an online depression prevention and data was collected before and after the prevention.

The author analyzed the data using linear regression analyses and indicate that for well-designed internet interventions, time spent on the program, session completed, exercise completed have clear relation on the effectiveness.

This article is selected because it's the first article that study the internet-based intervention for adolescent to prevent depression. This article showed that internet platform could support depression prevention for adolescents. Therefore, besides the consultation, internet intervention could also be provided in our application as it might be more useful for more common users. To prevent it happens is always better than treatment.

Keywords: Internet-based depression intervention, adolescent, depression prevention
Insights: Internet-based depression intervention could effectively reduce the depressive symptoms of adolescent.

Literature 3: Harnessing context sensing to develop a mobile intervention for depression.

This is a quite interesting article. The authors introduced their design which is a context-aware system in a mobile application for patients who suffering from depressive disorders to detect their mental health states and offer tailored assistance if necessary.

The system was based on three phases: the sensor on the mobile devices to collect data from user, the algorithm to "inductively learn the relationship between data collected and the actual activity and social context input by the user and in future predict these without user's input, the action component that receive this prediction from the user and trigger some action based on these prediction (like inform the psychologist, give suggestions/tasks).

The study indicate that the system had relatively high accuracy rates of prediction on the categorical contextual states, but poor accuracy on user's mental health states. Overall, most of the participants are satisfied with the system and report great improvements on depression symptoms.

This article is the first attempts using context sensing to detect and identify mental health states. Context sensing is also early ideas of the main feature of our team program, we reviewed a lot of literature about data tracking based on wearable devices. However, as a mobile application, it quite inconvenient to be rely on data from wearables. Besides, contextual sensing could be complex and will be quite difficult to identify user's mental health states. From this article we could also know that the accuracy of identifying user's mental health states is still very poor, which means it might not be a good idea to have it as a main feature of our application.

Keywords: context sensing, mental health states, mobile intervention
Insights: Current technologies (sensor, algorithm) couldn't support accurate context sensing, especially for detecting the mental health status of the user.

Literature 4: Internet and mobile interventions for depression: opportunities and challenges.

This article synthesized and discussed the studies in the past 15 years. The author indicate that different psychotherapies are equally effective. Also, this equality includes the format of the therapy. Therefore, online therapy, or guided self-help could be as effective as face to face therapy with psychologists. Besides, the author indicate that the depression intervention should be "minimum" without reducing effects. This is quite important because studies had proved that only a small part of the people suffering from depression actually get proper treatment. An important reason is the barriers of the traditional treatment including expensive cost, time contradiction and etc.

The author also mentioned that as the device that people mainly interact with, mobile phone could be a perfect platform for internet intervention. Patients could accomplish several tasks more easily through mobile devices, like self-assessment and monitoring. Also, as a tools for communication, mobile devices could also enhance the contact between the patient and counselor.

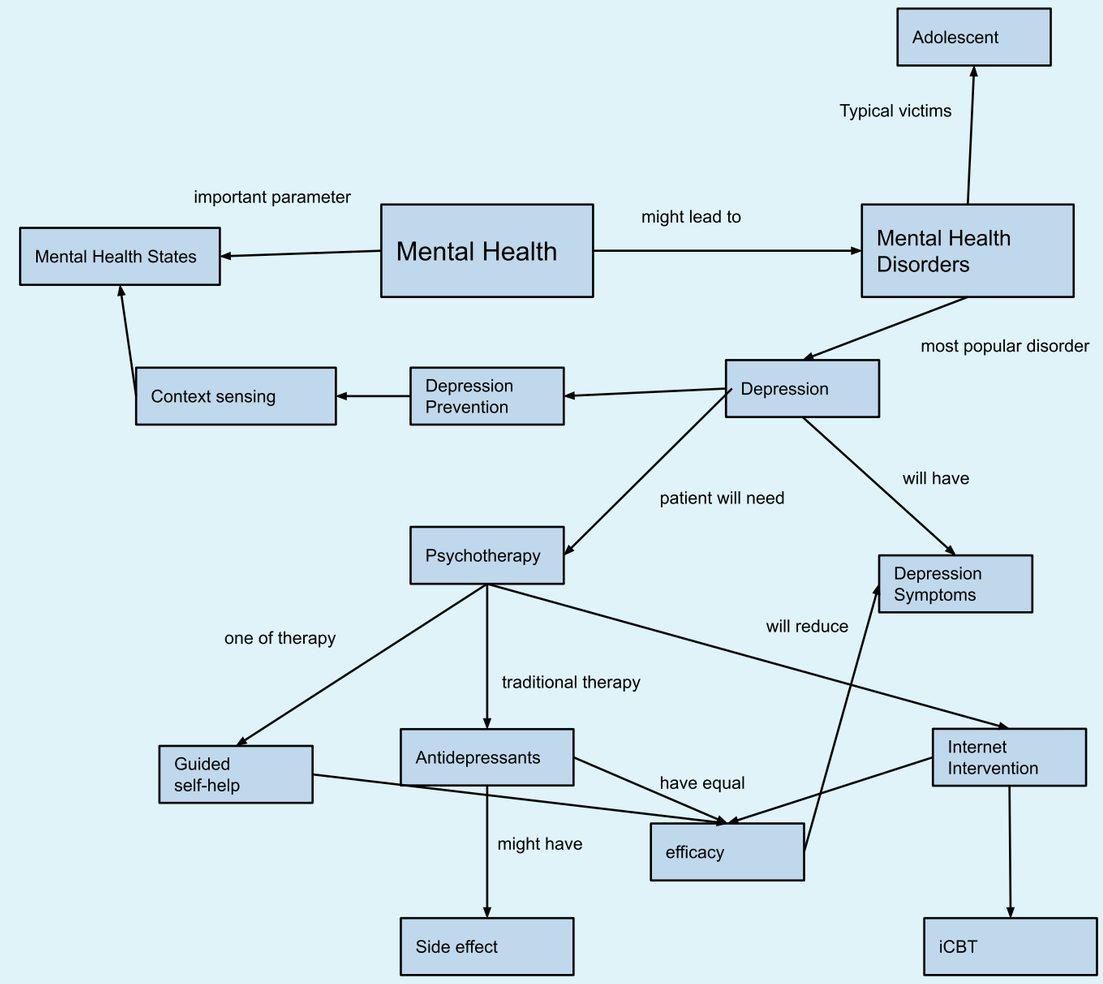
This article is very fundamental to our project, insights from the article gave us the basic idea and support. It not only showed that internet intervention could be as effective as traditional, but also indicated its superiority. Which is the core thing that encourage us to work on the program.

Keywords: Psychotherapy, internet interventions, guided self-help, face to face therapy.
Insights: Different therapies are all equally effective, differences between therapies are either small or nonexistent. Internet delivered therapy could be e

Literature 5:Technology-facilitated depression care management among predominantly Latino diabetes patients within a public safety net care system: Comparative effectiveness trial design.

TThis article introduced a design specified for a specific user group (Latino diabetes patients, also diabetes patients is a high-risk group for depression) as technology-facilitated depression care management system. The study was conducted involving comparison between the normal care and technology-facilitated depression care model, including automated telephonic depression screening and monitoring tailored to patient's special situation and conditions.

Concept Map



Overview

The articles selected are mainly used to identify the features, functions implemented in the application, concerning their feasibility, practicability and effectiveness. The first articles are summaries of past studies about internet interventions, illustrate its effectiveness, efficacy and comparison with traditional therapies.

The third and fourth articles are technical attempts that using internet-based intervention for depression prevention and studies the effect on the participants. Specifically, the fourth article explore the possibility using contextual sensing based on machine learning to detect user's mental health states, which is similar to our earlier idea, proved to be premature due to technology limits. It led us to abandon this function.

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