An application to enhance action and motivation in depression patients.

Shixu Yang

Introduction

My project aims to support individuals with depression in enhancing their activity levels and motivation through a mobile application. Depression is a pervasive condition, with consistently high prevalence rates worldwide. A core symptom of depression is a profound lack of motivation, leading sufferers to shy away from tasks they should undertake. In such states, they might endure challenging days filled with fatigue, despondency, hopelessness, and self-criticism. Within the mental health realm, common barriers to treatment include financial constraints, lack of therapeutic resources, time, transport issues, stigma, and cultural considerations. However, the advent of digital technology has significantly aided contemporary medical interventions to address mental and physical health challenges. Given the accessibility of mobile apps, I hope the application I design will serve as an effective strategy to alleviate the motivational deficits seen in individuals with depression. Users can utilise it during moments of reluctance, aiding action, or to maintain and monitor their activity levels.

Literature Review

Reason

Impaired executive function

This involves the ability to initiate and stop actions, to monitor and change behaviour as needed and to plan future behaviour when faced with novel tasks and situations allows us to anticipate outcomes and adapt to changing situations.

Dysfunctional attitudes

Cognitive distortions can lead to negative emotions. There are specific types of errors in this automatic thought, including arbitrary inference, selective abstraction, overgeneralisation, magnification and minimisation, personalisation and dichotomous thinking.

Prospective bias

Depressed patients have an impaired ability to simulate positive future events, so they may have difficulty engaging in positive activities that have the potential to improve their mood symptoms, leading to further entrenchment of their negative beliefs. In addition, a diminished sense of control over life events can lead to pessimistic expectations in depressed individuals

Solution

Behavioral Activation Treatment for Depression

Behavioural principles suggest that depression is caused by a lack of reinforcement for positive, non-depressing behaviours in the environment. Therefore, the goal of Behavioral Activation Treatment for Depression is to help patients identify, schedule and re-engage in positive activities. However, depression is often characterised by low motivation and lack of energy, which may make it more difficult for patients to start participating in scheduled activities, thus reducing the effectiveness of BA interventions. One way to promote motivation for scheduled activities may be through mental imagery.

Pellas et al.'s experiments suggest that mental imagery simulations of everyday activities can complement BA treatment for depression to achieve better treatment outcomes. Positive imagination towards goals leads to foreseeing more action details, facilitating the breakdown of actions into smaller steps.

Imagery intervention

Imagery intervention, often framed within the domain of guided imagery therapy, mental stimulation, CBM-I, functional imagery training have emerged as an efficacious means of mental health improvement. They primarily revolve around harnessing the power of the mind's eye to visualize and enact change. Example: Participants will hear brief descriptions of everyday scenarios. These descriptions are initially vague but always resolve positively. Participants are asked to vividly imagine themselves in these unfolding scenarios as if actively participating, practicing the generation of vivid, first-person, positive mental imagery.

Existing APP

Apps targeted at boosting mobility include apps that deliver behavioural activation therapies for people with depression, behaviour change apps that are not targeted at people with depression and vision board apps based on the law of attraction. No apps were found for mental imageryn-assisted behavioural activation for people with depression.

- Daily mood ratings
- Organisation and completion of activities
- Activity monitoring
- Provide information or explanation

Behavioural Activation APP Functions ∩ **Mental Intervention APP Functions**

- Guided Visualizations
- Interactive Imagery Exercises
- Customizable Imagery
- Pictures, audio and video

Conclusion

Combined with the SUS evaluation and user interview feedback, the usability of the APP was rated good overall. However for the first-time use experience for new users. There are still some areas that can be optimised.
The main functions of the APP were all considered effective by different users. However, during the user study, some users pointed out that the APP does not help them when they are in a state of unconsciousness or do not want to change. The APP may be more effective when the patient is conscious of self-help, and the APP may be used when there is a need to improve mobility, do stressful tasks, and organise spatial time. Some of the users feedback here that they need emotional support, rewards, more interaction to promote their use of the app.
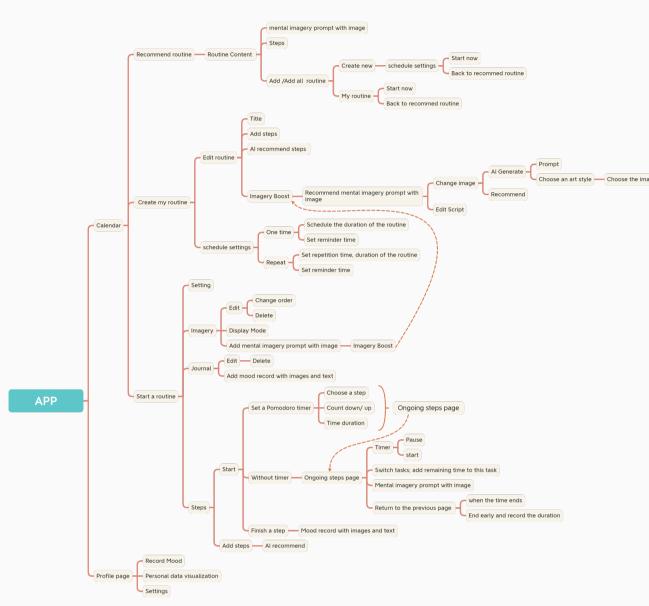
Limitation & Future Work

There's no fully operational app to facilitate extended testing, which implies the current study is based primarily on showcasing app functionalities and gathering users' perceptions of their efficacy. Although the collected user feedback is undoubtedly valuable, its limited volume and variegated nature, influenced by individual preferences and experiences, make it challenging to derive a comprehensive solution. Due to the constraints of mobile apps and the differences from traditional psychological therapies, behavioural activation therapy on mobiles often lacks a pronounced focus on emotions. Given the feedback from current users highlighting a need for emotional support, I will be delving deeper in the future to ascertain how elements of emotion can be best integrated with behavioural activation therapy components. Initially, I plan to introduce enhanced emotional interactivity and rewards, design a recommendation system rooted in user data, enhance the onboarding process for new users, and engage a larger user base for further research.

My Design

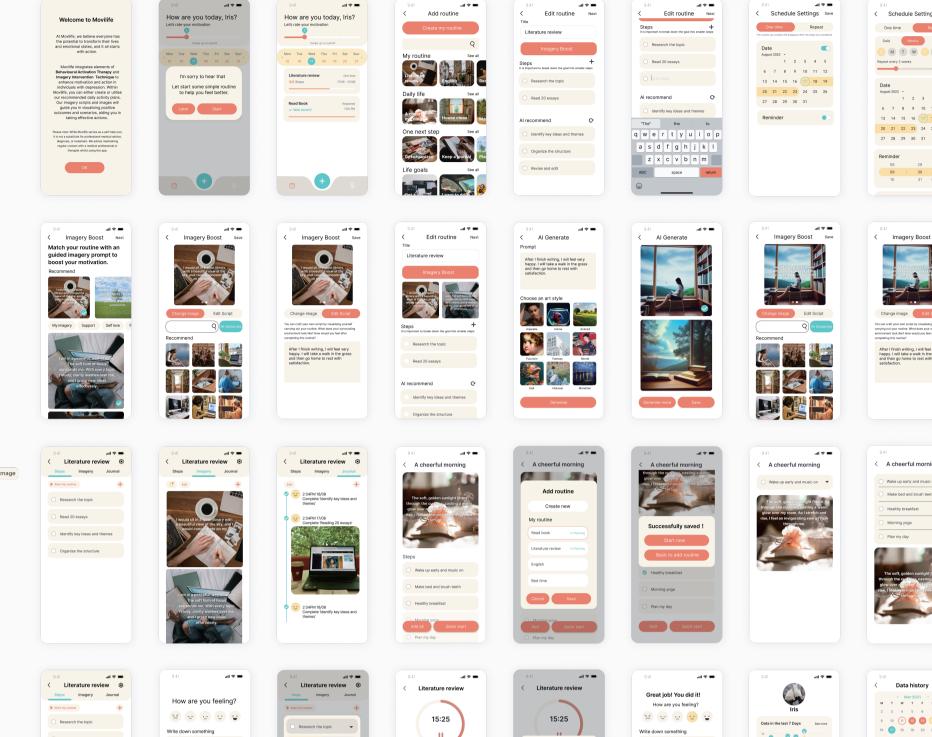### Solution

1. Recommends routines to the user, ranging from the most basic of life's little things to life's goals.
2. Helps users organise routines and break them down into smaller steps.
3. Provide positive mental imagery scripts to help users more easily come up with specific steps when creating a task, or increase positive predictions about conducting a routine to inspire action.
4. Collect user behavioural data and emotions to help users understand themselves better.
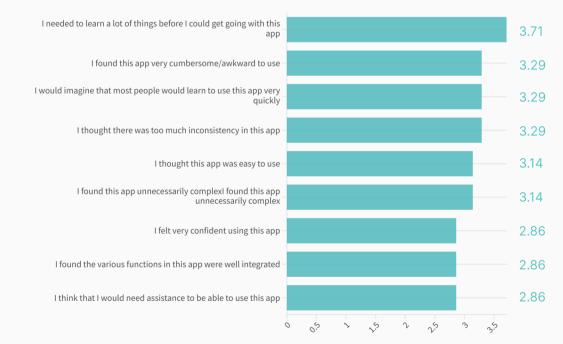
Information Architecture

User Study

Sus Score: 78.25/100 A-

Statement	Score
I needed to learn a lot of things before I could get going with this app	3.71
I found this app very cumbersome/awkward to use	3.29
I would imagine that most people would learn to use this app very quickly	3.29
I thought there was too much inconsistency in this app	3.29
I thought this app was easy to use	3.14
I found this app unnecessarily complex	3.14
I felt very confident using this app	2.86
I found the various functions in this app were well integrated	2.86
I think that I would need assistance to be able to use this app	2.86

Interview Result

Usability

APP is easy to use and understand. All users Feels that the app operation isn't complicated and the workflow is clear.Meanwhile, the app's features are well presented and provide a good user experience.
Users 1, 5 and 7 mentioned that it may take some time to familiarise themselves with the app for the first time, suggesting that more novice guidance should be added.

Usage Scenarios

Situations when feeling stressed or despair, Users will use the app to find relief and hope.
Situations when feeling less motivated, Users will use the app to start doing some small things.
Situations when here's some free time , Users will use the app to find what can they do.

Hi-fi Prototype

Feature	Description
Recommended Routine	This feature did motivate them to try new activities or continue their previous favourite activities. Some users mentioned that freshness can be motivating However, some users worried that the recommended activities might not match their actual needs or interests.
Create Routine	This feature is considered to be very useful as it allows users to develop a daily programme based on their interests and needs. And some users highlight the utility of task breakdown as a favorite feature.
Imagery Boost	Most users see the value in using mental imagery to motivate and remind. User 4 says that he likes this feature, it allows him to choose his favourite scenarios as if he were listening to a song. Some users emphasised the importance of matching mental imagery to personal preferences. User 2 said that positive imagery scripts are not as useful as listing plans when one is avoiding action.
AI Feature	Some users appreciate the AI's step-by-step breakdown, helping to tackle tasks. One user said that she like the idea of using AI to create personalized content. She'll take the time to use AI to build a library of mental imagery that matches her aesthetic, and that investment of time and something more personalised will keep her around
Conduct routines	Most users felt that this display really helped them to better plan and track their daily activities. Some users said that by using the tomato clock they were able to complete tasks more efficiently. However, some users felt that this method may not be suitable for all types of activities or tasks.
Recording and data visualisation	Many users are satisfied with the ability to log emotions and experiences related to tasks. There is an expectation of richer rewards or feedback. One user said that the app should offer suggested routines based on user feedback.
suggestion	Some users mentioned that the app needs to have more attention to the user's emotional well-being to help them generate self-help ideas. Some users have suggested that the app could consider adding social features so that users can share their activities and progress with others. One user hope there can be a module for travel planning.