Development of a Smartphone Behavioural Intervention

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Abstract

In the field of psychology, Social Anxiety Disorder is often treated using cognitive-behavioural therapy sessions between a patient and a clinical therapist. Many people in need of care have difficulty accessing treatment programs due to living in rural locations or having to work or attend school. Alternate online and gamified approaches have appeared in recent years allowing easier access to treatment. However, many programs struggle to keep user engagement at a high level. Since these programs are more often designed by therapists and teachers they often focus on including valid principles while struggling to make entertaining and engaging content. A location-based smartphone game is currently being designed to treat symptoms of social anxiety and deliver an intervention which will encourage the user to continue treatment.

1. Introduction

Social Anxiety Disorder (SAD) is described as a severe fear of negative evaluation from others, which leads people to avoid social interactions and situations [1]. The disorder is traditionally treated with cognitive-behavioural therapy (CBT), which has thus far shown to be the most effective method [2]. Of the large number of people who exhibit symptoms of SAD, only a small percentage actively seek treatment. Nowadays, most people own or have access to a smartphone device. Although smartphones contain advanced hardware sensors for gathering large amounts of various types of data, they are commonly used by many for casual gaming. Many mobile games promote social and physical activities. Pokémon Go is one such game, achieving over 500 million downloads on the Google Play Store to date. Playing these games, for many people, may seem like killing time, but it has been suggested that within the context of playing games is where some of the most positive emotional events are triggered [3].

2. Aim

The aim of the application is to create a smartphone intervention which can be used for the treatment of SAD symptoms. A detailed profile of the user context will be collected using available sensors such as movement, location and social activity. This data will be used to tailor user experience towards a suitable intervention. Physical activity will be encouraged for helping the user to go outside more frequently. Psychoeducation will be introduced through in-game quests and activities to present important lessons and concepts to the user. An important aim is to keep the user involved with the program over a long-term period. The application will use gamification techniques such as intrinsic and extrinsic reward systems to encourage continuous interaction from the user. It is important for the app to be entertaining to achieve this goal.

3. Existing Interventions

CBT is the most widely used form of treatment for anxiety disorders. This is usually delivered to a patient by a clinical therapist. Core components include psychoeducation (providing the patient with helpful information about their disorder), relaxation training and cognitive restructuring which involves patients learning to identify maladaptive thoughts [4]. Exposure therapy is another method which involves the patient placing themselves out of their comfort-zone to face their anxiety-provoking situations [4]. Group therapy is often helpful for patients to meet people with similar fears and practice speaking openly in front of a non-judgmental crowd. Several online and gamified interventions have started to appear in recent years which the user can complete without needing to seek much help from a medical professional.

4. Gamification

Intrinsic motivation involves participating in an activity because of enjoyment or interest. Extrinsic motivation means partaking because of external rewards such as fame, wealth or praise. It has been suggested that people who attempt goals for intrinsic motives (for the entertainment which trying provides) as opposed to those who try for external reasons (because they were told or given orders by others) have lower levels of psychopathology and more positive session results [5]. Studies also show that players can acquire important prosocial skills while playing games that are designed to “reward cooperation, support, and helping behaviours” [6]. The medical field has recognized many of the positive effects and has shown increasing interest in building medical interventions featuring gamification [7]. However, attempting to pull together a set of valid principles or lessons, serious games often end up with the “chocolate-covered broccoli” problem—the games don’t work as intended because the creative game dynamics that “induce transportation and immerse the user are missing, making them simply not fun” [8]. Purposeful gamification requires designers to make a connection for the user between their natural goals and
desires, and the non-game activity [9]. There is great potential in video games to encourage new forms of thought and behavior.

5. SAD Intervention App

To begin the intervention, the user will setup various details about themselves and then be presented with an avatar, which they can customize to fit their appearance. The user will then be shown a map view of their location. The map will contain resource markers which the user can collect by travelling to that location in the real world. Once a location is reached it is logged and the user is presented with a ‘mini-game’ in which they gather the resource. These resources will be used to craft new in-game items and weapons. As the user advances in the game they earn XP (experience points) which help increase their level and unlock new game content.

The user’s movements and locations will be stored and used to present specific quests and information to the user. Subtle activity tracking has been successfully implemented in other mental health applications. Each quest will have an underlying theme relating to SAD and will require the user to assess how they approach social situations. For example, quests may include helping an NPC (non-playable character) out of a scenario, thus reinforcing cooperative behavior. The user will be rewarded for daily use of the app, travelling certain distances and completing quests. Notifications will be used to alert the user of events and keep engagement if user activity should begin to decline. The remote server can interact with the app to schedule a short quest or activity for the user if they haven’t been using the app for some time.

The application should encourage the user to be more social while simultaneously delivering a gaming experience that the average everyday user enjoys, regardless of mental state.

6. Data Gathering

The application will keep a record of measurements such as daily steps taken, distance travelled and locations visited. From this, a detailed model of user activity can be created. This data will be used to alter the game experience. The data can also be used in future studies to see how the intervention has impacted the user’s physical activity and social interactions.

7. Conclusion

Although the application is still in development, there are plans to do a small pilot test. Subjects will take a short survey before using the app and will then be asked to use the app over a period of a few weeks. The data will be automatically collected on the remote server where an analysis can be done, comparing the initial interviews taken by users with activity from within the app. This analysis will show levels of user engagement with the app and may also provide indications as to the ability to reduce symptoms of social anxiety through use of the app.

8. References