

Design and Development of a Smartphone Application for Cue Exposure Treatment

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Introduction

Individuals with alcohol dependence have high relapse rate after outpatient treatment when confronted with alcohol related cues in real life. Cue Exposure Treatment (CET) is a method focusing on confrontation with alcohol cues in order to reduce cravings as well as the likelihood of relapse. The standard aftercare treatment is delivered via regular appointment with therapists, which consume time and clinical resources. We have formulated a study to investigate whether a smartphone based CET could increase the efficiency of cognitive behavioural treatment of alcohol dependent individuals. The smartphone app of CET has been developed based on a multidisciplinary collaboration involving patients, therapists, psychologists, psychiatrists, designers and engineers. This abstract describes the design and development of the app.

Materials and Methods

The initial structure and content of the treatment is designed by psychiatrists and psychologists according to a comprehensive literature survey on alcohol cue exposure studies. Designers start the sketches, and build the first prototype. After several user tests with psychiatrists, psychologist and therapists, a detailed structure of the program is confirmed. Then engineers and designers develop the app and test it among patients. Based on the feedbacks, a final version of the CET app is developed and will be used in future studies of testing its feasibilities and efficiency. The open-source Linux-based operating system Android was elected as the platform to develop the smartphone app. A customized version of Java in Eclipse (Oracle Corporation, Redwood City, CA) is used as the main programming language, and an online server is registered for database and monitoring of the treatment process remotely.

Results

The CET app includes four main-sections: Introduction, Training, Exposure and My Progress. The Introduction provides the rationale of CET and guidelines of the app. The Training section comprises the following five coping-strategies: 1) Endure the urge, 2) Negative consequences of alcohol abuse, 3) Positive benefits of sobriety, 4) Alternative beverages and food, 5) Alternative behaviour. At every session a new coping-strategy

is applied when exposed to alcohol. The Training section is integrated with the Exposure section. However, it is also possible to go directly into the Exposure section, when the five strategies have been trained. The Exposure section includes ten different alcohol exposure videos, where the patient can select preferred alcohol subject. During exposure the urge level is self-assessed for three times in order to monitor the exposure process. My Progress is designed in the app that enables the check of progress and performances on each training session. The training progress is displayed in graphs that show the trend of performance. Several algorithms are available to demonstrate the results, including the average and the best results of each session, history performance in a calendar, the most efficient coping-strategies and the best performed sessions, and overall result of the five sessions. User information and training records are saved in a local database. When the smartphone is connected to internet, the database is synchronized to an online database in a server. This protects the loss of data, and it also provides the access to clinical professionals for monitoring of the individual progress, as well as data analysis.

Conclusion

This abstract presents the process of developing a smartphone application for alcohol cue exposure treatment. It is based on a multidisciplinary collaboration, and transfer a complicated clinical therapy of alcohol dependency individuals into a smartphone application. From a comprehensive study on literatures to user centred design, it ensures the app with theory supported as well as a friendly user interface. The smartphone app is ready for clinical professionals on further studies of feasibility and efficiency test.

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