Serious Video Games as Psychosocial Interventions for Psychosis

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ABSTRACT

Psychosocial interventions for people with psychosis, such as Cognitive Behavioural Therapy, are an important and effective therapy to prevent relapses and assist with normal day-to-day functioning. However, there is a significant lack of provision of these therapies for this group, due largely to a lack of resources. Digital interventions offer promise in terms of increasing access to psychosocial interventions without the need for a large increase in resources. However, it can be challenging to ensure that people engage with therapies via digital means appropriately. This paper identifies existing examples of serious videogames for psychosis and highlights a number of challenges in developing future examples. Our future research will focus on investigating whether the development of serious videogames that embed Cognitive Behavioral Therapy may provide effective, engaging and accessible ways to sustain and improve mental health.

Author Keywords

mental health; psychosis; games; serious video games; psychology

ACM Classification Keywords

H.5.m [Information interfaces and presentation (e.g., HCI)]:Miscellaneous.

INTRODUCTION

What is psychosis?

In the UK the incidence of psychosis is 50 per 100,000 person-years; 80% of patients present between the ages of 16-30 (Cheng, 2010). Psychosis is a set of symptoms that affects one's mind. These symptoms include hallucinations, delusions, catatonia, or a thought disorder. Impairments in social cognition and other cognitive processes are common.

Psychotic symptoms are prevalent in the mental health disorders such as schizophrenia, bipolar disorder I, severe depression, schizoaffective disorder and delusional disorder.

Current state of art for psychosocial interventions for psychosis

The first line treatment for all of the above disorders is medication. Afterwards rehabilitation relies on psychosocial interventions to prevent relapses and assist with normal day-to-day functioning. There are a number of psychosocial interventions, the most researched ones are cognitive behavioural therapy (CBT), assertive community treatment, family interventions (FI), psychodynamic therapy, arts therapy and behavioural lifestyle intervention (combined physical activity and healthy eating). Usually psychosocial interventions are complex and consist of multiple interacting components. Their effectiveness varies too: FI is effective is preventing relapses and hospitalization in people with schizophrenia (Pharoah, 2010), while CBT may be useful in treating bipolar disorder but a high level of therapist expertise is required (Milkowitz, 2006).

Current research suggests a significant gap in the provision of psychosocial interventions for psychosis. Evidence comes from a recent systematic review (Ince et al, 2016), pointing out that rates of implementation for cognitive behavioural therapy and family interventions are still below recommended levels in the UK. in fact the most common barrier for successful implementation was identified as "organization" factors. Those include lack of resources (was found to be the most frequent factor), lack of dedicated therapy time, a lack of specialized training and workload pressure (Van Krieke et al. 2015). In order to address the existing barriers to delivery, the research has turned to the possibility of using e-mental health interventions, which have been found to be acceptable, feasible and potentially effective (Musiat, 2014; Opris, 2012). An example of a promising digital intervention for schizophrenia, is the "focus" smartphone intervention. During this intervention a mental health professional engages the patient in daily text messages to assess medication adherence and clinical status, provide feedback and support, and suggest coping strategies. The clinical

outcomes reported in this study were comparable or better than those produced by other psychosocial interventions (Ben-Zeev, 2014a).

Although low-intensity e-mental health interventions, such as FOCUS, have shown to be promising, they are believed to be not very engaging and regarded as too "experimental" particularly for psychosis (Steel, 2010; Gottlieb 2013). For that reason, "serious video games" have been proposed as a method of delivering digital mental health interventions whilst ensuring high levels of engagement and accessibility (O'Hanlon, 2016).

SERIOUS VIDEO GAMES
Serious video games are games whose primary purpose is to promote wellbeing, train and educate rather than provide pure entertainment. Well-produced serious games have been commercialized for improving psycho-education or specific behavioural changes in patients suffering from a variety of medical illnesses, such as: asthma (Bussey-Smith & Rossen, 2007), cancer (Beale et al., 2007), obesity (Barnett et al., 2011), diabetes (DeShazo et al., 2010), stroke (Saposnik et al., 2011) and pain (Hoffman et al., 2000).

Given the increasing popularity and number of examples of successful implementations in the area of physical health (Chan, 2010), researchers in the area of mental health services have started to investigate the possibilities for using serious video games to help mental health disorders.

Therapeutic Serious video Games for Mental health
There are as yet very few examples of serious videogames for mental health. A review of the literature led to the identification of the following examples:

- A randomized control trial of a serious game demonstrated that "Mindlight" (Wijnhoven, 2015) is effective in decreasing (sub) clinical anxiety symptoms in children who are diagnosed with an ASD.

- Two randomized control trials of "SPRAX" (Merry, 2012; Fleming 2011) found that this interactive fantasy game is a potential alternative to usual care for adolescents presenting with depressive symptoms to primary care.

- Another serious game "Playmancer" was reported to be effective in improving emotional regulation and impulsiveness in specific mental disorder such as eating disorders and pathological gambling (Fernández-Aranda, 2012). However, tt is important to note that study on "Playmancer" was a quasi-experiment rather than a RCT.

Therapeutic Serious Video Games for Psychosis
Whilst psychosis can manifest in a number of mental health disorders, the majority of the existing research on serious games and psychosis focuses specifically on three disorders: schizophrenia, schizoaffective disorder and bipolar disorder.

Schizoprenia and schizoaffective disorder
There are two existing serious games that aim to improve cognitive impairment in those affected by schizophrenia:

- Amado (2016) investigated a VR game that aimed to improve cognitive functioning in schizophrenia and schizoaffective disorder. The results of the study suggest that patients have improved both clinically and functionally.

- SociaVille (Rose, 2015), is an internet-based training program that contains a number of games and other exercises that targets social cognition deficits in schizophrenia. Preliminary studies demonstrate the feasibility and initial efficacy of Socialville in schizophrenia patients (Nahum et al., 2014) and a multi-site blinded randomized control trial is in progress.

Bipolar disorder
To the best of our knowledge, there is only one serious game that aims to help bipolar patients to deal with their condition.

- "Bipolife" encourages patients: to pursue their treatment; to keep daily routines; and to request to see the psychiatrist in case of relapse. The effectiveness of this interventions is yet unknown.

Whilst there are only a few examples of such interventions currently described in the literature, serious videogames for psychosis appear to offer promise. However, the literature only describes evaluations of these games in terms of their clinical effectiveness and little is known about their development.

CHALLENGES
This section outlines the challenges that are especially relevant to the future development, evaluation and use of serious games as possible interventions for psychosis.

Acceptance and Engagement
Although we have focused on identifying interventions that can be described as serious videogames in this paper, an alternative approach to trying to increase engagement with digital mental health interventions would be to employ gamification in the design. Research is required to identify whether designs that employ gamification of interventions such as CBT or serious games that embed the intervention (i.e. the stages of CBT) within the game mechanics are most acceptable and engaging to the intended users.

Engaging with stakeholders

Whilst a number of games have involved clinicians in the game design process, less attention has been given to including carers and patients in the process. Poon (2016) outlined that about 40% of carers of those with psychosis tend to experience depressive symptoms. Kuipers (2010) reported that supporting the carer will result in a significantly better outcome for the patient. Given that many games include social elements there may be opportunities to design a serious game that engages and benefits both carers and patients.

Long-term, clinically relevant evaluation

There is now substantial evidence from small-scale feasibility studies that people with psychosis are interested and willing to use digital technology designed to accommodate their particular needs (Naslund, 2015). The majority of existing studies focus on feasibility and usability of serious games (Walshe, 2003; Shrimpton, 2005; Fernández-Aranda, 2012; L. van der Krieke, interview with G. A.-A., 2015; Bono, 2016) , without consideration of the cost-effectiveness and actual clinical effectiveness of the intervention. However, further research is required in order to test whether game-like interventions can provide clinical improvements.

The main aim of psychosocial interventions is to prevent relapses and ensure prolonged functioning of the person. This is important because mental health conditions like bipolar disorder and schizophrenia are persistent and characterized by high rates of relapse. Only multi-year studies with repeated follow-ups can accurately assess whether new serious videogames make a long-term difference to mental health (Klasnja, 2011). To date, only one serious videogame "Playmancer" has been tested in multiple sites for a couple of years. Longitudinal trials should therefore be conducted in order to evaluate the effectiveness of serious videogames.

CONCLUSION - FUTURE FOR SERIOUS VIDEO GAMES AND PSYCHOSIS

Serious video games enable the delivery of interactive interventions for the management of psychosis in real-world contexts. The therapeutic use of serious video games for psychosis has the potential to increase the level of engagement with and accessibility to therapeutic interventions; tackling the existing gap in provision of psychosocial interventions. It is important to consider existing challenges and overcome them in order to ensure successful implementation of the serious video games in the mental health field.

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