Virtual reality interventions to improve cognition in major psychiatric disorders

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Introduction

Cognitive impairment is a factor contributing to sustained psychosocial and occupation dysfunction in people with psychiatric illnesses. However, there are few treatments with proven efficacy for cognitive dysfunction, especially as it translates to improvements in real-world functioning.

Cognitive remediation is a treatment for cognitive impairment provided to either restore or compensate functioning in the impaired cognitive domains and typically involves a guided set of standard tasks designed to focus on particular cognitive functions. Although cognitive remediation can improve performance on cognitive tasks, it has shown mixed results with regards to improvements in real world functioning.

Remediation programs using virtual reality (VR) could be used to provide effective training as the VR program can mimic real world settings for effective translation of skills. VR remediation has shown some preliminary efficacy in patients with dementia, traumatic brain injuries, and schizophrenia.

The aim of this systematic review is to assess the efficacy and usability of cognitive and functional remediation programs using VR for major psychiatric disorders (depressive disorders, bipolar disorders, schizophrenia/psychotic disorders, anxiety disorders or substance use disorder) in adults.

Methods and Paper Selection

The review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement.

Two authors (SV and DM) compiled and independently reviewed titles/abstracts and full texts for inclusion. Disagreements were resolved by consensus with a third author (TC). Fig. 1 shows the selection process.

Fig. 1 Paper Selection

PRISMA style flow chart depicting how papers were selected for the systematic review.

For a paper to be included, participants must have completed a VR intervention (immersive or non-immersive), with at least one domain of cognition functioning evaluated before and after the intervention. Cognitive domains are defined as per the MATRICS Consensus Cognitive Battery.

Samples had to be comprised on adults with major psychiatric disorders including depressive disorders, bipolar disorders, schizophrenia/psychotic disorders, anxiety disorders or substance use disorder.

Results

Thirteen papers were included in the final review. Of those thirteen papers, six cognitive domains were examined. Some papers measured more than one domain. Fig. 2 shows the breakdown of cognitive domains.

The papers can be categorized into three remediation types: Social skills training, real world simulations and vocational training. Five papers used social skills training, 5 papers used real world simulations and 4 papers used vocational training. At least one paper used a combination of two types.

Fig. 2 Cognitive Domains Measured

This graph shows the frequency at which each cognitive domain is measured within the final selection of papers. Some papers measure more than one domain, so these categories are not mutually exclusive.

Discussion/Next Steps

Our review suggests that there is preliminary evidence supporting the efficacy of VR remediation in improving cognitive functioning in psychiatric disorders. Future research should investigate long term effects and measure improvements in real world functionality.

Reference / Bibliography