

knowledge snapshot



Cognitive boosting interventions in the treatment of addictions

What this article is about

Impulsivity is the tendency to act without thinking about the negative consequences. Impulsivity is a key feature of substance use and gambling addictions. Impulsivity also predicts relapse. Impulsivity can be divided into two types. The first is impulsive action. Impulsive action is the ability to stop a response that one has learned to be associated with a reward. The second is impulsive choice which is the preference for smaller immediate rewards over larger delayed rewards. Substance use and gambling disorders may influence impulsivity by disrupting our bodies' natural neurotransmitters.

Three treatments have shown promise in helping to improve impulsivity in the treatment of addictions. The first is computerized cognitive training (CCT). CCT uses computer programs to help enhance specific thinking abilities. An example is to help people retain and manipulate information in our short-term memory, which is called working memory. The second is cognitive remediation (CR) which helps to apply higher-order thinking strategies to real-life settings. For example, goal management training may help increase the ability to plan and achieve goals. The third treatment is cognitive enhancers (CEs) which are drugs that help improve people's thinking abilities.

In this study, the researchers identified and compared studies using CCT, CR, and CE in the treatment of substance use and gambling disorders. Specifically, the researchers examined the effects of the above interventions on decreasing impulsivity.

What was done?

The researchers searched for studies that examined CCT, CR, and CE reducing impulsivity. They identified

Why is this article important?

Impulsivity is the tendency to act without thinking about the negative consequences. Impulsivity can be divided into impulsive action and impulsive choice. Impulsivity is a risk factor in the development of addiction. Impulsivity can also increase the risk of relapse. In this article, the researchers identified and reviewed studies that examined computerized cognitive training (CCT), cognitive remediation (CR), and cognitive enhancers (CE) in improving impulsivity for substance use and gambling disorders. A total of 23 studies were included. No studies were identified for gambling disorder. Sixteen studies provided enough data for statistical analysis. CCT and CE were not effective in improving impulsive choice or impulsive action. CR in the form of goal management training did not improve impulsive action, but was associated with improvement for impulsive choice. CR may be an effective treatment for substance use disorders.

studies published before December 31st, 2019. The studies were included in the review if they met the following criteria: The studies examined the effects of CCT, CR, and CE on improving impulsivity compared to a control group. The studies consisted of people who were over the age of 18 and seeking treatment for substance use or gambling disorder.

The researchers found 2,240 unique articles. Of these, 23 articles were eligible to be included in the review. For each article, the researchers assessed the risk of bias using the Cochrane Collaboration's tool. Sixteen articles provided enough information for the meta-

analyses. Meta-analysis is a statistical analysis that pools the results from multiple studies on the same topic. It allows researchers to draw conclusions about the effects of an intervention.

What you need to know

All studies involved participants who were seeking treatment for substance use disorders. No studies on gambling disorder were found. Five of the seven CCT studies used working memory training. Two of the four CR studies used goal management training. Out of the 12 CE studies, four studies used modafinil and four used galantamine. Other types of CCT, CR, and CE had only one single study. All the goal management training studies used treatment as usual as a control group. Most of the working memory training studies used an active control group (e.g., a working memory task without the training). Most of the CE studies used placebo as a control.

Thirteen studies with 485 participants did not show an improvement of impulsive action for CCT, CR, and CE. Seven studies with 302 participants did not show an effect of improving impulsive choice for CCT, CR, and CE. In terms of specific intervention, two studies with 95 participants did not show an effect of working memory training on improving impulsive action. Five studies with 236 participants also did not show an improvement in working memory for impulsive choice. For goal management training, three studies with 99 participants did not show an improvement for impulsive action. Two studies with 66 participants found significant improvement in impulsive choice with goal management training. Four studies with 160 participants showed no improvement in impulsive action for modafinil. Four studies with 131 participants also did not show an effect of galantamine for impulsive action.

Who is it intended for?

The research is intended for clinicians and researchers. Clinicians could use this research to incorporate goal-management training for addictions. Researchers could conduct future high-quality trials of substance and gambling disorders.

About the researchers

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Citation

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Gambling Research Exchange (GREO) has partnered with the Knowledge Mobilization Unit at York University to produce Research Snapshots. GREO is an independent knowledge translation and exchange organization that aims to eliminate harm from gambling. Our goal is to support evidence-informed decision making in safer gambling policies, standards, and practices. The work we do is intended for researchers, policy makers, gambling regulators and operators, and treatment and prevention service providers.

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