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Application of Technological Advances in the Assessment and Treatment of Addiction in Corrections

Technology-based assessments and treatments are highly promising techniques for reducing impulse control deficits and substance use among federally sentenced offenders in Canada.

Why we did the study

Substance use disorders (SUDs) are highly prevalent among offenders in the criminal justice system, with estimates as high as 70-80% in Canada. Deficits in impulse control (including difficulty inhibiting or controlling behaviour, delaying gratification, and increased risk-taking behaviour) are known to contribute to SUDs and criminal behaviour in independent lines of research, but the impact of these deficits among offenders with SUDs is unclear. Effective assessment and treatment of SUDs requires use of "best practices" and the application of new technologies. The goals of this review were to 1) critically evaluate the literature on impulse control deficits in offenders; 2) summarize what is known about the brain basis of these deficits; and 3) discuss recent applications of technology to treat SUDs in offenders.

What we did

A literature search of multiple databases yielded 28 peer-reviewed studies assessing impulse control deficits in offender samples. Computerized assessments of impulse control were grouped into two domains: 1) inhibition and 2) risky/impulsive decision-making. Representative studies using brain imaging (e.g., functional magnetic resonance imaging, etc.) and technology interventions (e.g., mobile apps, internet-based, virtual reality, etc.) were reviewed.

What we found

The research studies included in the review were conducted in a range of countries (44% in North America) and settings (83% in correctional or forensic institutions). Across the studies, offenders had relatively consistent deficits in response inhibition and delay of gratification (e.g., impulsive choices). Risk-taking measures were less consistent, with some studies finding that offenders make excessively risky choices and others not.

Research using structural and functional brain imaging emphasize deficits in the frontal lobes (e.g., prefrontal cortex) as an important contributor to impulse control deficits in offenders. Several studies suggested that impairments in impulse control and corresponding brain deficits may serve as a risk marker for future criminal involvement and reoffending.

Technology-based treatments for addictive disorders have shown initial effectiveness in correctional settings, resulting in significant reductions in craving and substance use. Promising interventions include mobile apps, internet-based programs, and virtual reality cue exposures.

In general, we found that research on the intersection of impulse control deficits, criminal behaviour, and SUDs is lacking. An important priority for research is to study impulse control deficits among offenders with problematic levels of substance use.

What it means

Deficits in impulse control have important implications for criminal behaviour, substance use, and long-term success following release. Developing new ways of reducing these impulse control problems may reduce burden on the criminal justice system.

Technology-based assessment and treatment may be especially useful in prison settings due to barriers to accessing evidence-based "best practice" treatments in this environment, such as face-to-face psychotherapy.

Although the studies reviewed suggest that offenders have consistent difficulties in impulse control, research on impulse control deficits in offenders with SUDs remains limited and therefore a key area for future research.

For more information

Amlung, M., Vedelago, L., Morris, V., Petker, T., Balodis, I., McLachlan, K., Mamak, M., Moulden, H., Chaimowitz, G., & MacKillop, J. (2018). *Application of Technological Advances in the Assessment and Treatment of Addiction in Corrections: A Systematic Review*. (Research Report R-418). Ottawa, Ontario: Correctional Service of Canada.

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