

RESEARCH SUMMARY BRIEF

CONTINGENCY MANAGEMENT FOR THE TREATMENT OF STIMULANT USE DISORDERS

The Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM–5TR) defines stimulant use disorder as “a pattern of amphetamine-type substance, cocaine, or other stimulant use leading to clinically significant impairment or distress” (American Psychiatric Association [APA], 2022). According to the 2022 National Survey on Drug Use and Health (NSDUH), 1.8 million people over the age of 12 had methamphetamine use disorder, 1.4 million people had cocaine use disorder, and 1.8 million people had prescription stimulant use disorder in the U.S. (Substance Abuse and Mental Health Services Administration [SAMHSA], 2023). The latest data from the NSDUH show that the prevalence of methamphetamine use in Ohio had a sharper increase (83%) than the United States (9%) in 2017-2018 and 2018-2019. The prevalence of cocaine use in Ohio showed an increase of 8% for the same period; whereas, there was a 5% decrease in the United States during that timeframe (SAMHSA, 2021).

Contingency Management (CM) is a behavioral treatment model rooted in operant conditioning, aiming to modify behavior through positive reinforcement (Higgins & Petry, 1999). Initially popularized in the 1980s and 1990s, it was primarily used to address alcohol and cocaine dependence. CM reinforcement approaches include voucher-based rewards, prize-based rewards, and abstinence-based housing. This brief outlines findings from a review of the research literature focused on the effectiveness and utility of CM.

Contingency Management Components

CM-based interventions use positive reinforcement to incentivize clients to adopt new behaviors and habits. CM programs identify observable and measurable behaviors to reward on a predetermined and consistent basis. For example, to promote drug abstinence, a program might collect urine drug tests (UDTs) multiple times each week and reward clients for each negative sample. Voucher-based CM rewards clients with vouchers of monetary value for achieving desired behaviors (Budney & Higgins, 1998). Prize-based CM allows clients to earn a prize or enter a drawing for prizes if they achieve pre-specified goals (Petry & Stitzer, 2002). Abstinence-based housing CM, which was designed for individuals experiencing homelessness, offers access to housing as an incentive for sustaining drug abstinence.

Literature Review Methods

In 2023, a literature review was conducted to investigate outcomes associated with CM. The literature review included searching multiple research databases: PsycINFO, MEDLINE, SocINDEX, Psychology and Behavioral Sciences Collection, and Cochrane Library. Thirty-six articles met eligibility criteria for a full review. All 36 studies used experimental study designs¹ and of these, 24 examined

voucher-based CM, 10 examined prize-based CM, and two examined abstinence-based housing CM. Most (n=26) studies were conducted in the U.S., five in Spain, four in Brazil, and one in Switzerland. Twelve studies included participants from vulnerable populations such as individuals experiencing homelessness, pregnant women, individuals with severe mental illness, veterans, and men who have sex with men. Table 1 outlines other characteristics of the reviewed studies.

Table 1. Description of Reviewed Contingency Management Studies (Total n=36)

Reinforcement/ Incentive type	Voucher-based (n=24) Prize-based (n=10) Housing-based (n=2)
Incentivized behavior	Stimulant abstinence (n=26) Stimulant and other drug/alcohol abstinence (n=9) Treatment attendance (n=1)
Outcomes	Drug use (n=36) Retention (n=33) HIV-related (n=4)
Drug use type(s)	Primary stimulant use disorder (n=36) Concurrent substance/alcohol use disorder (n=21)

¹ participants randomly assigned to either CM or another form of treatment, or to no treatment

Findings

Overall, the evidence strongly supported the effectiveness of CM in improving stimulant use outcomes and treatment retention. Participants exposed to CM demonstrated enhanced abstinence and reduced drug use, along with improved retention rates. Additionally, although not always statistically significant, several studies suggested that CM-related improvements in drug use outcomes extended beyond the active treatment periods.

Drug Use: Drug use was primarily assessed as abstinence from stimulant-type drugs, verified through urinalysis. Studies often reported the longest duration of abstinence, percentage of participants with stimulant-negative UDTs, and percentage of stimulant-negative UDTs. Some studies reported on the percentages of stimulant-positive UDTs. Most studies evaluated CM in conjunction with another type of treatment such as the Community Reinforcement Approach (CRA) or Cognitive Behavioral Therapy (CBT). Overall, the reviewed research provided support for voucher-based CM as a promising strategy for reducing stimulant use and promoting abstinence. Prize-based CM also appeared to be efficacious in promoting abstinence from stimulants such as cocaine, methamphetamines, and amphetamines. The few studies that explored housing-based CM reported mixed findings on its impact on drug use. One study reported that a group receiving housing-based CM had a significantly higher percentage of days abstinent at two- and six- months than a comparison group receiving only behavioral day treatment (Milby et al., 2000). The housing-based CM group also sustained abstinence longer than the comparison group at two- and six-month assessments. Another study compared CM alone to a CM plus day treatment group (CM+). On average, the CM+ group had longer consecutive weeks of abstinence than the CM only group, but the difference was not statistically significant (Milby et al., 2008).

Retention: Examples of retention related outcomes were measured across the studies included treatment completion, average number of weeks in treatment, average number of sessions, length of stay, and session attendance. Most studies showed favorable retention outcomes for participants receiving voucher-based

CM. Studies examining the average number of weeks in treatment or session attendance generally found that CM groups had better outcomes compared to the groups that did not receive CM. Findings on the effectiveness of prize-based CM for improving treatment retention were mixed. Although most of the studies found differences in retention-related outcomes for prize-based CM groups compared to groups receiving other treatments, there was not enough statistically significant evidence to suggest that exposure to longer and higher-magnitude prize-based CM improved retention outcomes. Among the studies that reported positive effects, the prize-based CM groups generally stayed longer in treatment and attended more sessions (Petitjean et al., 2014; Petry et al., 2005; Petry et al., 2012; Petry et al., 2018; Roll et al., 2013). The two studies investigating housing-based CM reported mixed findings regarding retention. One found that adding housing-based CM to a day treatment resulted in significantly improved retention outcomes compared to day treatment alone (Milby et al., 2000). The other study comparing a CM only group to a CM plus day treatment group did not find any statistically significant differences in their retention rates (Milby et al., 2008).

HIV-related: HIV-related indicators, such as health behaviors and HIV status were examined in a few studies. One study found significantly greater reductions in stimulant use and greater increase in health-promoting behaviors among the voucher-based CM group (Reback et al, 2010). In the voucher-based CM condition, HIV-seropositive participants accomplished significantly more health-promoting behaviors than HIV-seronegative participants, but there were no differences based on HIV status in the control group. In a study examining prize-based CM, results indicated that CM is an effective technique for reducing drug and alcohol use, HIV risk behavior (injection drug use), psychiatric symptoms, and rates of inpatient hospitalization in seriously mentally ill adults (McDonnell et al., 2013). None of the reviewed studies investigated the impact of housing-based CM on HIV-related outcomes.

Limitations

One limitation identified in the literature is the inconsistent use of fidelity measures. Of the 36 studies reviewed, two reported use of clearly defined fidelity measures. Some studies had a proxy or an indicator without explicitly mentioning fidelity such as implementing and adhering to schedules or procedure used in prior literature, referring to a CM manual or having qualified staff implement and oversee procedures. Moreover, 10 of the reviewed studies were completed outside of the United States, which limits generalizability to the U.S. population due to cultural differences and attitudes about substance use. Additionally, although the purpose of this review was to investigate treatment of stimulant use disorders, the majority (n= 21) of studies enrolled samples that had concurrent substance or alcohol use disorders in addition to stimulant use. As a result, it may be difficult to disentangle the impacts of CM on stimulant use alone versus on stimulant use as it occurs in the context of other substance use.

Conclusion

Studies included in this review generally found CM to be effective for reducing drug use and improving treatment retention for individuals with stimulant use disorders. Across various CM modalities—voucher-based, prize-based, and abstinence-based—positive outcomes are evident, with voucher-based CM being the most extensively investigated. Research findings suggest that the benefits of CM may extend beyond the treatment duration, highlighting its potential for long-lasting impact. CM also had promise for reducing drug use and improving retention for special populations such as pregnant women, individuals experiencing homelessness, veterans, individuals with severe mental illness, and gay and bisexual men.

The research did not provide clear evidence supporting an “ideal” number of substances to target at once in a CM program. Changing the number of substances targeted in a CM protocol did not seem to affect how well CM worked to reduce drug use outcomes. Hence, the number of substances to target in CM interventions should be based on the specific needs of the client population and the operational procedures of the substance use treatment agency.

In addition to exploring the efficacy of CM in treating various forms of stimulant use disorders, several studies recommended further inquiry into cost-effectiveness. Several studies argued that CM is a wise investment because the cost per patient is insignificant compared to the clinical, social, and economic burden of stimulant use (Miguel et al., 2019; Murphy et al., 2015). A few studies favored higher value CM protocols over lower value CM protocols for addressing drug use outcomes (Garcia-Rodriguez et al., 2009; Petry et al., 2004). CM may be more effective if programs allow the amount of incentive delivered to increase with the number of behaviors or substances being targeted, severity of the population, and treatment duration (Rash, 2023).

The California Department of Health Care Service has had success implementing a statewide voucher-based CM program called the California Recovery Incentive Program (Peck et al., 2023). Insights and lessons learned from the rollout of that program may benefit the implementation of CM in Ohio.

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