



Contingency Management for the Treatment of Alcohol Use Disorders

Research Summary Brief

The Diagnostic and Statistical Manual of Mental Disorders, 5th ed., (DSM-5TR) defines alcohol use disorder (AUD) as “a problematic pattern of alcohol use leading to clinically significant impairment or distress” (American Psychiatric Association [APA], 2022). An individual may be diagnosed with AUD when they meet at least two of several criteria within a 12-month period, including increased use over time, impaired ability to stop or control use, cravings, withdrawal symptoms, increased tolerance, and continued use despite negative consequences to one’s health, psychological well-being, work, and social relationships (APA, 2022). According to the 2023 National Survey on Drug Use and Health (Substance Abuse and Mental Health Services Administration [SAMHSA], 2024), overall alcohol use among U.S. individuals aged 12 and older increased from 132.5 million (47.4% of the population) in 2021 to 134.7 million (47.5%) in 2023. In 2023 alone, approximately 134.7 million Americans aged 12 and older reported drinking alcohol in the past month. Of these individuals, 61.4 million (45.6%) reported binge use and 16.4 million (12.2%) reported heavy alcohol use (SAMHSA, 2024). In Ohio, statewide drinking habits align with national averages. In 2023, 15.6% of adults in Ohio reported binge drinking, compared to the national median of 15.2% (Centers for Disease Control and Prevention [CDC], 2024a). The CDC estimated that 6,750 Ohioans died from excessive alcohol use between 2020 and 2021 (CDC, 2024b).

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, examples of CM reinforcement approaches include voucher-based rewards, prize-based rewards, and rewards in the form of various privileges that are valuable to the client (e.g., medication- or treatment-related). This brief outlines findings from a review of scholarly literature focused on the utility and effectiveness of CM for treating AUD.



Contingency Management Components

A fundamental principle of CM is providing immediate rewards for meeting target treatment goals that support and reinforce a drug-free lifestyle (Michigan Department of Health and Human Services, 2024). Most CM-based interventions emphasize positive reinforcement to incentivize clients to adopt new behaviors and habits, although some programs respond to missed behavioral targets by building in a punishment component, such as a “reset” or loss of incentive value or quantity or other privileges. Programs are encouraged to identify and focus on observable and measurable behaviors to reward on a predetermined and consistent basis (Petry & Stitzer, 2002). For example, to promote drug abstinence, a program might reward clients for each negative urine drug test (UDT). A program that also uses negative reinforcement might incorporate a predetermined negative consequence, such as an incentive amount reset for a missed UDT.

When using voucher-based incentives, CM programs reward clients with vouchers of monetary value for achieving desired behaviors (Budney & Higgins, 1998). In a prize-based CM program, clients may earn prizes or chances to enter drawings to win prizes for achieving pre-specified goals (Petry & Stitzer, 2002).

Culturally Tailored CM for AUD

AUD and related health disparities disproportionately affect American Indian/Alaska Native populations (AI/AN) compared to other racial/ethnic groups, resulting in a need for interventions that are effective, widely accessible, and culturally appropriate (Campbell et al., 2023). Culturally tailored evidence-based practices for substance use treatment reflect the beliefs, values, views, history, behaviors, language, and are inclusive of traditional healing practices of AI/AN people (Campbell et al., 2023; University of California Los Angeles Integrated Substance Use & Addiction Programs, 2021).

Literature Review Methods

A literature review was conducted in 2024 to investigate the impact of CM on AUD and related outcomes. The review process included searching multiple research databases: APA PsycInfo, CINAHL, MEDLINE, and Psychology and Behavioral Sciences Collection. An article was eligible if it was published within the last 10 years, experimental in design, included a sample comprised of individuals with AUD, and focused on alcohol use or mortality outcomes. Eleven articles met the eligibility criteria for a full review.

Findings

The review included 11 studies, all of which employed experimental designs where participants with an AUD diagnosis were randomly assigned to a CM condition or another treatment condition for comparison purposes. Seven studies evaluated voucher-based CM intervention, and four studies examined prize-based CM. All 11 studies focused on alcohol use outcomes, five studies reported treatment retention, and one reported mortality/morbidity-related outcomes. Six studies included participants from special or vulnerable populations such as individuals experiencing homelessness formerly (Jett et al., 2024) or currently (Novak et al., 2023), and AI/AN adults (Campbell et al., 2023; McDonnell et al., 2021a, 2021b), and those with co-occurring mental illness (McDonnell et al., 2017). Fidelity was monitored in one study (McDonnell et al., 2021b). Table 1 summarizes the main characteristics of the reviewed studies.

TABLE 1. DESCRIPTION OF REVIEWED CONTINGENCY MANAGEMENT STUDIES (TOTAL N=11)

Reinforcement/incentive type	<ul style="list-style-type: none"> • Voucher-based (n=7) • Prize-based (n=4)
Outcomes	<ul style="list-style-type: none"> • Alcohol use (n=11) • Treatment retention (n=5) • Mortality/morbidity (n=1)
Special populations	<ul style="list-style-type: none"> • AI/AN (n=3) • Individuals experiencing homelessness currently or formerly (n=2) • Co-occurring mental illness (n=1)

Alcohol Use

Studies often used UDTs as an objective measure of alcohol use. Seven studies used self-reports of drug use in addition to objective measures. All studies (n=11) incentivized alcohol abstinence and three studies included other abstinence from substance use (e.g., tobacco and drugs) as additional targeted outcomes. The reviewed studies point to the effectiveness of CM in decreasing alcohol use and promoting abstinence among individuals with AUD. Five studies found that CM helped reduce alcohol use, five studies showed mixed results, and one study was inconclusive yet found favorable results for CM.

Treatment Retention

Retention in treatment was reported by five studies in terms of treatment completion rates (Campbell et al., 2023; Jett et al., 2024; McDonnell et al., 2017), number of days in SUD treatment on average and staying in treatment for 90 days (Hammond et al., 2021), and dropping out of treatment (McDonnell et al., 2021a).

Overall, these studies demonstrate mixed results for retention for the CM groups, with some studies reporting slightly better retention and others reporting slightly worse. Studies usually did not find any statistical differences between the groups.

Mortality/Morbidity

Only one study reported mortality/morbidity outcomes. In their culturally tailored CM intervention for AI/AN populations, Campbell et al. (2023) reported no significant change in total drug and sexual risk behavior scores across or between the two treatment groups.

Limitations

This literature review provides important insight into the utility and effectiveness of CM, but it has some limitations. First, while the search process was systematic, it was limited to studies published within the last 10 years and conducted in North America. The purpose was to provide current and contextually relevant information about CM; however, it might have excluded potentially valuable research from other time periods or countries. The review also only included studies with experimental designs and may have overlooked important findings from observational or qualitative studies that could have provided additional context or nuance to the understanding of CM utility and effectiveness. Moreover, studies were included for review only if the whole sample or the majority of the participants had a diagnosis of AUD.

Second, studies had considerable variations in the treatment duration and the amount of reward value with respect to voucher-based CM. For example, some studies provided CM for three weeks (Koffarnus et al., 2018; Koffarnus et al., 2021) or four weeks (Orr et al., 2018), while others provided CM for 12 weeks (Campbell et al., 2023; Hammond et al., 2021; McDonnell et al., 2017; McDonnell et al., 2021a, 2021b), or 26 weeks (Jett et al., 2024). For voucher-based CM studies that reported maximum earnings from CM intervention (n=6), values ranged from \$350 for a three-week period (Koffarnus et al., 2018; 2021) to \$2,045 for a 26-week period (Jett et al., 2024). Prize-based CM studies did not vary as much in terms of prize value. The value of prizes won ranged from \$1 to \$100 (Campbell et al., 2023; McDonnell et al., 2017; McDonnell et al., 2021a, 2021b).

Finally, operationalization and measurement of alcohol use outcomes pose another limitation. While all of the studies employed objective measures of alcohol such as UDT or transdermal monitoring, the intensity of the assessment periods and other methodological conceptualization varied across studies.

Conclusion

The results of this literature review suggest that CM can be effective in reducing alcohol consumption and promoting abstinence. Five out of 11 studies reported positive outcomes (Koffarnus et al., 2018; McDonnell et al., 2021a, 2021b; Novak et al., 2023; Orr et al., 2018), and another five showed mixed results (Campbell et al., 2023; Dougherty et al., 2023; Jett et al., 2024; Koffarnus et al., 2021; McDonnell et al., 2017). One study that did not conduct statistical analyses also reported favorable outcomes for the CM group that demonstrated higher abstinence rates compared to the TAU group (Hammond et al., 2021).

The studies included in this review explored to a lesser degree other outcomes, such as treatment retention and mortality/morbidity. Five studies reported retention outcomes (Campbell et al., 2023; Hammond et al., 2021; Jett et al., 2024; McDonnell et al., 2017, 2021a) and showed mixed and typically non-significant differences between CM and comparison groups. Only one study reported mortality/morbidity by focusing on drug and sexual risk behaviors and did not find a CM effect. More research is needed to assess CM impact on these outcomes.

Several studies focused on vulnerable populations including AI/AN (Campbell et al., 2023; McDonnell et al., 2021a, 2021b) and individuals experiencing homelessness formerly (Jett et al., 2024) or currently (Novak et al., 2023), and those with co-occurring mental illness (McDonnell et al., 2017). The review surfaced that motivational interventions often were tailored to and generally effective with these unique populations. For instance, McDonnell et al. (2021a, 2021b) included prize items that were meaningful to AI/AN individuals. Another study utilized an abstinence-contingent wage supplement program that provided job support for individuals experiencing homelessness, promoting both alcohol abstinence and economic stability (Novak et al., 2023).

Six studies monitored alcohol use remotely using breathalyzers (e.g., Koffarnus et al., 2018), transdermal monitoring devices (e.g., Novak et al., 2023), and blood collection devices (Jett et al., 2024). A study that delivered CM through a digital application found high levels of compliance and satisfaction with the app and showed higher retention in substance use treatment among app users compared to the non-app using control group (Hammond et al., 2021). Such remote applications have the potential to reduce CM patient-tracking burdens on staff by automating and digitizing test results and reward statuses, yet they should be implemented with caution. One study reported adverse events such as rashes and cuts related to TAC monitoring devices (Novak et al., 2023). Some participants quit the study because they did not want to wear the device anymore, while one participant quit because of dress-code restrictions imposed by a new job.

In conclusion, this review supports the effectiveness of CM in treating AUD. The successful adaptation of CM for vulnerable populations and integration of remote monitoring presents opportunities for broader implementation. Even though the evidence supports CM's effectiveness in reducing alcohol use and promoting abstinence, to better guide implementation, future research should address gaps in long-term outcomes, such as fidelity to CM, treatment retention, and mortality/morbidity.

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