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Disseminating Contingency Management to Increase Attendance in Two Community Substance Abuse Treatment Centers: Lessons Learned

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Abstract

Although Contingency Management has been shown to be effective in substance use treatments, community adoption has been slow. In order to increase dissemination of contingency management (CM) into community practice, two community treatment programs collaborated with university faculty investigators to design, implement, and evaluate low-cost, prize-based CM interventions delivered by treatment staff using Petry's (2000) fishbowl technique. A pre-post study design was used to evaluate the impact of CM on outpatient group attendance. All clients attending the targeted outpatient groups at both treatment programs were eligible to participate. Group attendance was significantly positively impacted after intervention implementation. This is one of the first studies demonstrating successful implementation of CM by community treatment program counselors within their existing treatment groups. The discussion focuses on practical lessons learned during the planning and implementation of the interventions.

Keywords

contingency management; motivational incentives; dissemination; community treatment program; substance use

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1. Introduction

Contingency management (CM) uses behavioral principles to reinforce the occurrence of a targeted behavior. This intervention is one of the most efficacious treatments for substance use disorders (Chambless & Ollendick, 2001), having demonstrated improvements in, for example, rates of abstinence, completion of recovery-related activities (Prendergast, Podus, Finney, Greenwell, & Roll, 2006; Stitzer & Petry, 2006), and treatment completion (Brooner, et al., 2004; Iguchi, Belding, Morral, Lamb, & Husband, 1997; Sigmon & Stitzer, 2005; Svikis, Lee, Haug, & Stitzer, 1997). Unfortunately, despite its effectiveness and relative simplicity, CM has not been widely adopted in standard clinical practice (Henggeler, et al., 2008; Petry & Simcic, 2002).

A key to increasing the use of CM is to identify and resolve implementation barriers that apply to the intervention itself and within each prospective treatment site. Practical aspects of implementation, such as the cost of incentives, are the most oft-cited objections to CM (Kirby, Benishek, Dugosh, & Kerwin, 2006). To address cost concerns, Petry and colleagues (Petry, 2000; Petry & Simcic, 2002) developed the “fishbowl” technique. Whereas traditional CM interventions utilize a progressive reinforcement fixed ratio schedule by increasing rewards for the contingent behavior each time it occurs, the fishbowl technique uses a variable ratio reinforcement schedule. This latter technique rewards behavior with a *chance* to be reinforced. Each time a contingent behavior occurs, the participant draws a ticket from a fishbowl. Draws progressively increase with continued performance of the behavior. As only a proportion of tickets are equal to a tangible prize, reinforcement is variable and, thus, much less expensive. The fishbowl technique also addresses other practical issues, including reducing the need for continuous record-keeping and frequently purchasing prizes. Despite using a variable ratio reinforcement schedule, the two seminal studies of the fishbowl technique found it significantly improved treatment retention and abstinence in community-based outpatient programs (Petry, Peirce, et al., 2005) and abstinence in community-based methadone maintenance clinics (Peirce, et al., 2006).

An additional barrier to CM is its problematic implementation in group settings (Petry & Simcic, 2002). While most empirical studies provide CM reinforcements during individual sessions (Petry, Tedford, & Martin, 2001), substance abuse treatment is generally offered in groups. Recent studies have shown successful implementation of CM in groups, with positive effects on group cohesion (Alessi, Hanson, Wieners, & Petry, 2007; Kirby, Kerwin, Carpendo, Rosenwasser, & Gardner, 2008; Lash, et al., 2007; Ledgerwood, Alessi, Hanson, Godley, & Petry, 2008; Petry, Martin, & Finocche, 2001; Petry, Martin, & Simcic, 2005). In fact, a recent study demonstrated counselors can successfully implement CM within groups even with minimal training or supervision (Ledgerwood, et al., 2008).

The current study was designed to proactively disseminate CM into community practice. Staff from two CTPs and university faculty researchers collaborated to design, implement, and evaluate a CM intervention that met the following goals: the targeted client behaviors should be relevant to the CTPs, CTP staff should be able to continue the intervention beyond the study period if effective, and CTPs’ established evaluation measures should be used to determine CM effectiveness. A pre-post study design was used to evaluate the targeted behavior of outpatient group attendance. No clients attending the CTPs’ targeted groups were excluded from receiving the intervention. The groups maintained open enrollment throughout the study period, and the groups’ counselors conducted the CM intervention. This paper describes the process of planning and implementing these real-world CM interventions, the outcome of these efforts, and the positive and negative experiences during the researcher-practitioner collaboration.

2. Materials and methods

This study was a joint collaboration by clinicians and researchers from the Texas Node of the National Institute on Drug Abuse (NIDA) National Drug Abuse Treatment Clinical Trials Network (CTN). The CTN was created in 1999 to improve the quality of drug abuse treatment by conducting multi-site clinical trials and to ensure research results are transferred to providers and patients in a timely manner (Hanson, Leshner, & Tai, 2002). The CTN achieves this mission via “nodes,” each of which are composed of an academic center and affiliated CTPs.

The present dissemination effort was initiated with a workshop that informed clinical staff of the Texas Node CTPs about evidence-based treatments. The workshop was attended by 35 treatment providers (from front-line counselors to clinic directors) from 7 CTPs. While all CTPs expressed interest in adopting CM, two CTPs successfully overcame their implementation barriers and planned, funded, and implemented a CM program. Both participating sites’ clinic directors chose to target outpatient group attendance due to its clinical relevance. The Institutional Review Board at the University of Texas Southwestern Medical Center approved the dissemination study as exempt; therefore, no identifying client information was collected. This allowed CM to be implemented in real-world clinical settings without burdening participants or clinics with obtaining informed consent.

2.1 Participating Sites

2.1.1. Site 1—The Mental Health and Mental Retardation of Tarrant County’s Addiction Services Division, located in Fort Worth, Texas, provides the full-spectrum of treatment for substance use disorders. CM was implemented in the outpatient Methamphetamine Treatment Program (MTP), funded by the Center for Substance Abuse Treatment (CSAT; TI-16284). The MTP provided treatment for adults with amphetamine and/or methamphetamine abuse or dependence, based on the Matrix Model approach (National Institute on Drug Abuse, 2009; Rawson, 1999). Patients were required to attend four weekly clinical groups. Patients could attend exercise (offered twice weekly) and auricular acupuncture or meditation/stress reduction (i.e., “acudetox”; 3 to 4 times each week) as recommended or desired. MTP services were offered at two locations, but most clients attended the centrally located site. Approximately 50% of MTP referrals were from legal sources, men and women were equally represented, and clients were primarily Caucasian (87%) or Hispanic (11%) and 25 to 44 years old (67%). The MTP enrolled 79 patients during its last year, and the current CM project was during the final months of the MTP.

As program-level attendance goals had not been met by the 18th month of CSAT funding, CTP staff implemented a CM program in which clients earned a \$50 gift card after attending groups for one month. When attendance was unimproved after ten months, the MTP staff and director collaborated with Texas Node investigators to modify their incentive program. Client focus groups revealed the current gift card program’s incentives were not consistently delivered, clients were unaware of or misinformed about the program, and a \$50 card had not been earned by a single client in several months.

2.1.2. Site 2—Nexus Recovery Center, Inc. in Dallas, Texas provides residential and outpatient treatment for women with substance use disorders. Clients first enroll in either residential, intensive outpatient (IOP; typically 5 days per week), or supportive outpatient (SOP; typically 2 to 3 days per week). The main clinic provides all services while a satellite clinic provides IOP and SOP services to adult women only. Adult clients were primarily Caucasian (52%), African-American (32%), or Hispanic (15%). Client drug of choice was identified as crack (25%), methamphetamine (25%), marijuana (17%), cocaine (12%), alcohol (12%), or heroin and other opiates (9%). Site 2 had an informal incentive program in which goods donated from community supporters were used to reward client behavior and successes.

The site decided to use this opportunity to modify the way in which these goods were used and implement a formal program at the satellite clinic.

2.2 Contingency Management Intervention

2.2.1. Planning and Training—The planning and training phase at Site 1 took approximately six months. Planning at Site 2 began as Site 1's intervention was ending and took about two months. The CM Trainer (TR) was previously trained in behavior modification and obtained additional one-on-one training through the Mid-Atlantic Addiction Technology Transfer Center (ATTC). The Trainer also used materials from the NIDA / Substance Abuse Mental Health Services Administration Blending Initiative product "Promoting Awareness of Motivational Incentives" (PAMI) to facilitate CM program development. The PAMI product (<http://www.nida.nih.gov/Blending/PAMI.html>) was based on previous CTN studies on Motivational Incentives to Enhance Drug Abuse Recovery (Peirce, et al., 2006; Petry, Peirce, et al., 2005) and provides introductory information about using low-cost incentive programs using fixed and variable ratio reinforcement schedules. It focuses on variable ratio reinforcement schedule Content was reviewed with staff and ideas for CM programs were brainstormed. Regular contact between the Trainer and CTP staff was made via telephone, e-mail, and face-to-face to design the intervention with consideration for each sites' specific culture, programs, schedules, staff, and funding mechanisms. Ongoing education about CM was provided during CTP staff meetings to promote intervention buy-in throughout the clinics. The Trainer attended staff meetings and observed treatment groups, with clients' permission, to provide strategic input.

In the weeks immediately prior to implementation, site staff that implemented (group counselors plus a back-up) and supervised (Site 1: two senior counselors, Site 2: program director) the CM programs attended a half-day training in monitoring and recording attendance, conducting prize drawings, and distributing and documenting prizes won. On-site supervisors were also trained to facilitate day-to-day operations. The Trainer then provided face-to-face consultation and supervision weekly for the first four weeks of the intervention and biweekly for the remainder of the intervention, as well as telephone and e-mail consultation as needed. Clients created posters and decorated prize drawing containers in the week prior to the start of the intervention.

2.2.2. Implementation—Client focus groups were used to select reinforcers, and prizes were purchased prior to CM implementation to consolidate staff time. All clients enrolled in the targeted groups were eligible to participate. New patients were informed about CM verbally, via an insert in their enrollment materials, and by posters in the group room. A variable reinforcement schedule was implemented wherein clients attending treatment in a given day earned a chance to win a prize. Chances of winning were inversely related to the value of the prize. An escalation and reset method (Roll & Higgins, 2000; Roll, et al., 2006) was used to reward consecutive days of attendance with increasingly more chances to earn prizes. For example, attending groups four days in a row resulted in four prize drawings on the fourth day. The number of draws per day reset to one upon absence from the group and at the beginning of each week. Drawings occurred during groups, and prizes were distributed after group. Choices in each prize category were fewer as the cache of prizes were depleted near the end of the intervention. Some CM methods differed based on site-specific needs and are described below.

2.2.2.1. Site 1: Site 1 conducted the CM study during the final months of MTP funding and used a 10-week intervention period. Reinforcers were funded by the CSAT grant. The site's existing monthly \$50 gift card incentive program was replaced with a daily fishbowl prize drawing. Clients attending all groups offered in a given day drew a prize ticket during the day's

last group, with drawings escalating and resetting as described previously. Fifty percent of the tickets had “Good job! Try again.” on them; 25% had “Good job! You get a small prize!” worth a \$5 gift card to book stores, mass retailers, coffee shops, or fast food restaurants; 25% had “Good job! You get a medium prize!” worth a \$15 gift card to the same retailers; and one ticket had “Good job! You get a jumbo prize!” After the jumbo prize \$50 gift cards were distributed, a jumbo \$60 prize in the form of three \$20 gift cards was used. \$20 cards were used due to the ease of purchasing. Clients who won stayed after the group to select their prize.

2.2.2.2. Site 2: Site 2 implemented 14 weeks of the intervention. Reinforcers were funded by using a collection of previously donated goods and soliciting additional donations from private donors. There were too few prizes to use the fishbowl method of daily prize drawings. Instead, after each group, clients deposited a ticket with their name on it into the prize bowl if they arrived in the first 15 minutes of group and remained until the end. Drawings escalated and reset as described previously. Drawings were held in group every other Friday; clients did not have to be present to win. The prize awarded was identified immediately prior to the drawing and included items such as personal care products and gift cards to national retailers. Approximately 40% of the prizes were valued at less than \$10, 40% between \$10 and \$15, 15% between \$20 and \$25, 5% between \$30 and \$60, and 1% valued at \$100.

2.3 Measures

Sites collected attendance data via existing clinic procedures (i.e., counselor and clinic logs, state-mandated electronic databases). Attendance data were extracted for (1) the weeks corresponding to the intervention and (2) the same number of weeks immediately prior to the intervention. The latter measure served as a baseline attendance measure. Site staff extracted, de-identified, and summarized the number of sessions attended each week by enrolled clients. Site 1's clients were “enrolled” from the date of admission until their discharge date from the four-month MTP program. Site 2's clients were considered “enrolled” until they had not attended for 10 consecutive business days.

2.4 Statistical Analysis

Due to the small number of observations and serial dependence of time series data, the data were examined with simplified time-series analysis using the *C* statistic (Tryon, 1982, 1983; Young, 1941). The *C* statistic is an omnibus statistic that evaluates variability in successive data points relative to changes in slope from one experimental phase to another. Rejecting the null hypothesis indicates the data are likely non-random (i.e., a trend or a pattern exists). The baseline phase is analyzed first to determine if the data are random. If analysis of the baseline phase indicates the data are not significant (random), the experimental phase can be analyzed. A significant result from the experimental phase analysis indicates the data are not random and, thus, a trend exists in the intervention phase. Graphs of the data are then visually evaluated to determine the direction of the trend.

3. Results

3.1. Site 1

Site 1's census was approximately 45 clients during the baseline period and steadily decreased to about 20 clients during each of the final two months (during the intervention) of the MTP's funding period. The number of clinical, exercise, and acudetox groups attended per week are shown in Figure 1. Baseline total attendance across all groups was random ($Z = -0.770, p > .05$) and intervention phase attendance was statistically significant ($Z = 1.786, p < .05$), indicating intervention phase attendance was not random. Visual inspection of Figure 1 reveals a decrease and another increase near the end of the intervention. On average, 58 sessions were

attended per week during the baseline phase and 80 sessions were attended per week during the intervention.

One known implementation problem occurred at Site 1. The prize bowl was left unattended once in the final month of the intervention. Two clients found the jumbo prize ticket, crinkled it, returned it to the prize bowl, and one of them selected it during the drawing. Other clients reported the incident and the jumbo prize was withheld.

3.2. Site 2

Site 2's census was 45 clients and remained relatively constant throughout the project. Baseline total group attendance was random ($Z = 1.208, p > .05$) and intervention phase attendance was statistically significant ($Z = 3.406, p < .05$), indicating intervention phase attendance was not random. On average, 63 sessions were attended per week during the baseline phase and 84 sessions were attended per week during the intervention. Subsequent decreases over time during the intervention and the terminal increase is similar to that seen in Site 1.

Some problems with implementation occurred at Site 2. The prize bowl was not emptied after the first two drawings (weeks 16, 18), resulting in clients who were no longer enrolled remaining eligible for prizes. The protocol was subsequently changed such that the prize bowl was to be emptied after each drawing. The new protocol was not followed for the third drawing, resulting in client frustration when two to three non-enrolled clients won prizes. As seen in Figure 2, this seems to be reflected in decreased attendance during weeks 20 to 23. The new protocol was consistently implemented starting with the fourth drawing (week 22) when the Trainer attended and observed. This led to improved client morale, which appears reflected in increased attendance from week 24 on.

4. Discussion

CM interventions targeting outpatient group attendance were implemented by group counselors within their existing groups at two CTPs. Results indicate the intervention was significantly associated with an increase in group attendance at both sites. Ledgerwood et al. (2008) also demonstrated successful CM implementation by community treatment centers' counselors within existing treatment groups. While not without challenges, it appears that with sufficient guidance, CTPs are able to overcome logistical barriers to successfully implement CM.

After CM was implemented, weekly attendance in both treatment programs increased, then decreased, and slightly increased again at the end of the intervention. Site 2's implementation problems coincided with the decreased attendance and their resolution appears to have precipitated the rebound during the final weeks of the intervention. However, Site 1 attendance also demonstrated a similar change over time. Therefore, attendance fluctuations during CM may have been related to other factors, such as lower enrollment in the final weeks of the intervention (Site 1), fewer opportunities to attend groups (acudetox not available for three weeks at Site 1), or decreased client awareness of the intervention over time. Of note, these attendance fluctuations are similar to those reported in a more controlled study (Petry, Martin, et al., 2001). Since weekly attendance data is not typically reported, however, the ability to interpret the current findings in the context of the literature is limited. This study's attendance across time data suggests CM reward protocols may need to be adapted, even for interventions of short duration, to sustain effectiveness.

The CM programs were deliberately designed to be easily administered, maintained, and evaluated by treatment staff. As such, all clients attending the targeted groups were eligible for reinforcement, new clients joined the groups throughout the project, and there was no

control condition. Thus, attendance improvements may have been due to factors other than the intervention, such as cohort effects or the reduced overall enrollment numbers at both sites.

The fishbowl approach used in the current studies differs from traditional CM, most notably in the reinforcement schedule. The traditional fixed ratio, progressive reinforcement schedule of CM effectively establishes behavior change over time. However, variable reinforcement schedules are more effective in maintaining behavior change after contingencies are discontinued. Therefore, the fishbowl method is theoretically more likely to establish lasting behavior change post-intervention. However, the way in which the fishbowl technique was implemented in the current studies (i.e., resetting prize drawings each week; limiting prize options to gift cards; purchasing prizes prior to implementation, resulting in fewer prize options near the end of the intervention) may have limited its effectiveness. Another departure from behavioral reinforcement principles was holding prize drawings every two weeks at Site 2 rather than temporally congruent with the behavior to be reinforced. Although these implementation modifications may have blunted treatment effectiveness, they were intended to make implementation and continued adoption of CM financially feasible relative to the traditional approach.

As the focus of the present effort was to implement CM into standard clinical practice, the experience shed light on several implementation and adoption challenges. In order to build upon the practical information contained in the accumulating literature on program characteristics associated with CM adoption (Ducharme, Knudsen, Roman, & Johnson, 2007), steps to implementing a successful CM program (Kirby, et al., 2006; McGovern, Fox, Xie, & Drake, 2004; Miller, Sorensen, Selzer, & Brigham, 2006), and dissemination and adoption strategies in the substance use field in general (Carise, Cornely, & Gurel, 2002; Guydish, Tajima, Manser, & Jessup, 2007; Kirby, Amass, & McLellan, 1999; Reback, Cohen, Freese, & Shoptaw, 2002; Stirman, Crits-Christoph, & DeRubeis, 2004), the remainder of the discussion will focus on lessons learned during this dissemination effort.

4.1 Lesson #1: Begin securing funding immediately

Five programs, in addition to the two that participated, were enthusiastic about implementing CM. However, funding was a major barrier to these five sites even after a year or more of faculty and staff efforts. For example, creative attempts were made to offset financial barriers, as suggested by Petry (2000), but failed at a criminal justice site when administration would not allow probationers to exchange community service hours for treatment attended. The two participating sites' funding sources differed greatly from the other sites, as Site 1 received funding specifically for implementing evidence-based treatments while Site 2 garnered extraordinary community support for general programming.

The fishbowl method was selected because it uses a variable reinforcement schedule, resulting in lower costs via fewer distributed incentives. Site 1's prizes cost approximately \$48 per intervention day or an estimated \$12,480 per year. Of note, this average cost is inflated due to including the cost of gift cards purchased even though not all of the gift cards were distributed during the intervention. Site 2's total value of distributed prizes was approximately \$26 per intervention day or an estimated \$6,760 per year; most prizes valued at \$20 and below were donated.

4.2. Lesson #2: Stagger intervention onset

CM was implemented at Site 1 after six months of planning. Lessons from Site 1's planning and implementation periods were then applied to Site 2, likely contributing to Site 2 needing only two months of planning. Staggering the intervention start dates allowed time to encounter and resolve problems prior to replicating them at the next site. This staged approach can be

especially useful for sites with limited experience with an intervention, as positive results can garner additional staff support and assist with funding efforts.

4.3. Lesson #3: Consider organizational culture and routines

Site 1 had an established culture of providing to indigent clients non-contingent prepaid gasoline cards. Allowing staff to continue this practice, even though it could have undermined the CM intervention, was one key to increasing staff acceptance of the new CM program. Site 2's admissions and outpatient departments initially notified clients about the CM program as part of their standard orientation and included a CM flyer in orientation packets. This routine worked well but, over time, these notifications decreased. Thus, it is important to identify all staff behaviors associated with a new intervention's success and then devise methods to assure those behaviors persist. For example, periodically reminding staff to inform clients about the CM program or rewarding staff for the most referrals to the CM group would have helped staff modify their triage routine.

4.4. Lesson #4: Practice, be detailed, and monitor

Petry (2000) recommends specifically delineating how the program will be administered on a day-to-day basis before implementation. Writing a thorough protocol (i.e., standard operating procedure) allows staff to consider all aspects of implementation and can be a springboard to discussing "what if" scenarios. Involving the whole team in these steps can identify various potential problems, as each member will offer a unique perspective.

The importance of practicing all of the procedures is critically important. This not only helps ensure implementation occurs as planned, but may also reveal potential problems. These could be relatively benign, such as discovering a bag is needed to carry the CM materials to groups, or it could identify larger issues, such as needing more time than imagined for prize drawings. The amount of practice needed is dependent upon the complexity and frequency of the intervention. For example, Site 2's prize drawings occurred only once every two weeks, allowing time for procedures to be forgotten. The ongoing problems with Site 2's drawings also underscore the importance of in-person communication and observation of procedures by an expert during the early phases of implementation. The type and frequency of monitoring also should be weighed against the difficulty of the intervention, as well as on factors such as staff members' previous experience with the intervention.

4.5. Lesson #5: Be prepared for reactions—good and bad

Anecdotally, the idea of implementing CM was received favorably by staff and management at the treatment programs. Furthermore, counselors' enthusiasm increased as attendance improved. Clients exhibited enthusiasm for the CM program when their input was solicited during the planning stage. However, Site 2's clients' excitement waned as implementation problems arose. In addition, Site 2's clients in the Supportive Outpatient Program expressed dissatisfaction that, since they attended treatment less often than clients in the Intensive Outpatient Program, they had fewer opportunities to earn incentives. These clients' negative reactions highlight the importance of involving them when possible, taking time to explain decisions that may initially appear unfair, being willing to modify the program based on clients' reactions, and apologizing when mistakes are made.

A recent meta-analysis found greater researcher involvement in the design and/or delivery of CM was associated with larger effect sizes (Prendergast, et al., 2006). However, to increase adoption of effective treatments into standard practice, their effectiveness in real-world conditions must be demonstrated. The current study accomplished this by incorporating the fishbowl technique of CM in two community treatment programs and training group counselors to deliver the intervention. As a result, group attendance increased during the intervention,

many lessons were learned during the collaboration, and clinicians learned new skills. It is hoped that this study's successes and failures will inform others' efforts to implement evidence-based treatments in such a way that the knowledge remains in the clinic after the outside investigators are no longer involved.

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Figure 1.

Site 1 outpatient group attendance before and during contingency management. The vertical dotted line indicates the intervention began in week 11. Clients were involved in pre-implementation activities in Week 10. "All clinical groups" represents the four clinical groups offered throughout the week. Attending all clinical, exercise, and acudetox sessions offered in a day was reinforced with a drawing from the fishbowl. "Acudetox" was not offered in weeks 11, 12, or 17.

Figure 2. Site 2 outpatient group attendance before and during contingency management. The vertical dotted line indicates the intervention began in week 15. Clients were involved in pre-implementation activities in Week 14. Weeks 12 and 13 correspond to December 24 through January 4.