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Training Workshops Positively Impact Beliefs about Contingency Management in a Nationwide Dissemination Effort

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Abstract

In 2011, the Veterans Administration called for nationwide implementation of contingency management (CM) in its intensive outpatient substance use disorders treatment programs, and this study evaluated the impact of the initial 1 and ½ day training workshops on knowledge and perceptions about CM among 159 clinical leaders from 113 clinics. Workshop attendance significantly increased CM-related knowledge ($d = 1.88$) and changed attendees' perceptions of CM (ds = 0.26-0.74). Endorsement of barriers to CM adoption decreased and positive impressions of CM increased. These perceptions about CM emerged as key correlates of post-training preparedness to implement CM. Results suggest that training workshops can be an effective avenue for increasing CM-related knowledge, as well as addressing persistent misperceptions about CM that may impede adoption efforts. Continued efforts to introduce educational materials and offer training and consultation opportunities may increase understanding about this evidence-based intervention among clinicians, thereby leading to improved patient outcomes.

Keywords

contingency management; training; workshops; substance use disorders; implementation; clinicians

1. Introduction

Contingency management (CM) is an evidence-based behavioral intervention for the treatment of substance use disorders (SUDs). In CM, patients earn tangible reinforcement in

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the form of vouchers or prizes when they meet verifiable target behaviors, such as abstinence from drugs as assessed by urinalysis testing (Petry, 2000). The National Institute of Drug Abuse Clinical Trials Network evaluated CM in 803 stimulant abusing patients in 14 intensive outpatient SUDs treatment programs and methadone clinics throughout the United States (Peirce et al., 2006; Petry et al., 2005) and found that CM was efficacious in enhancing abstinence relative to usual care services. Meta-analyses find that this intervention reduces drug use across a range of SUDs (Griffith, Rowan-Szal, Roark, & Simpson, 2000; Lussier, Heil, Mongeon, Badger, & Higgins, 2006; Prendergast, Podus, Finney, Greenwell, & Roll, 2006) and produces the largest effect sizes when compared to relapse prevention and cognitive-behavioral approaches or other psychosocial treatments for SUDs (Dutra et al., 2008).

CM remains one of the least understood and utilized evidence-based SUDs treatments (Benishek, Kirby, Dugosh, & Padovano, 2010; McGovern, Fox, Xie, & Drake, 2004; Willenbring, Kivlahan, Kenny, Hagedorn, & Postier, 2004). In a review of CM's implementation science literature, Hartzler et al. (2012) highlight several areas of concern that may partially explain slow clinical uptake. For example, although the literature supporting CM's efficacy is robust, clinician's perception about its efficacy is low. Organizational climate also impacts clinician participation in implementation efforts. Organizations that make approval of CM explicit, allow or facilitate training for CM, or have directors/supervisors who are advocates of CM are more likely to engage clinicians (Hartzler et al., 2012). Roll et al. (2010) and Petry (2010) discuss larger systems issues related to the costs of CM and health care coverage. Most clinics must generate their own funds to support CM, which is a major impediment to widespread use of CM in clinical practice.

CM also faces strong philosophical objections or emotional reactions from some in the addictions field and the public (Petry, 2010). These concerns include the likening of CM to bribery and that CM may undermine internal motivation for recovery. Further objections include those related to paying people to do what they should do on their own and oppositions based on one's own experiences with recovery. Petry (2010) notes that many of these concerns are expressed only with regards to CM's application to the treatment of SUDs and are rarely raised regarding the use of CM in other treatment contexts (e.g., serious mental illness; see also Parke et al., 2011). The issue of stigma may need to be addressed directly in order for attitudes toward CM to shift favorably.

Despite these challenges, several recent reports describe successful CM implementation efforts in clinical programs. Henggeler et al. (2007, 2008a) led a statewide effort to introduce evidence-based practices for the treatment of SUDs in adolescents in South Carolina. Results suggested that organizations and clinicians were interested in CM, and this interest translated into implementation efforts on the part of the clinicians, with 58% of eligible clinicians reporting implementing CM with at least 1 patient following the training. Lott and Jencius (2009) demonstrate the efficacy and cost effectiveness of CM in a clinic for adolescents in Illinois. We (Ledgerwood, Alessi, Hanson, Godley, & Petry, 2008; Petry, Alessi, & Ledgerwood, 2012ab) conducted CM trainings in 11 clinical settings; following these training experiences, therapists adherently and competently administered CM, and patient outcomes improved. Kellogg et al. (2005) describe the positive experiences of clinicians, administrators, and patients in New York City Health and Hospital Addiction Services when CM was instituted.

A feature shared by these studies was the provision of CM training. However, most community clinicians endorse lack of CM training opportunities as significant barriers to adoption (Benishek et al., 2010; Rash et al., 2012). Without access to training, few clinicians

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are likely to implement CM, and those who do may attempt to implement without adequate understanding of the principles underlying this behavioral intervention. For example, in a recent survey about CM (Rash et al., 2012), a large percentage (46%) of addiction treatment clinicians who reported having implemented CM did so with no or very brief (≤ 2 hours) training. Notably, we (Rash et al., 2012) also found that the majority of counselors who reported using CM did not integrate effective behavioral parameters (e.g., they utilized low magnitude reinforcers, provided reinforcement infrequently, and/or did not deliver reinforcement immediately). Poorly designed or executed CM protocols are unlikely to yield positive changes in patient outcomes (Petry, Alessi, Ledgerwood, & Sierra, 2010; Petry et al., 2012ab; Petry, 2012), and negative experiences derived from attempts at implementing CM interventions with inappropriate behavioral parameters may contribute to clinical perceptions that CM is ineffective (Benishek et al., 2010; Rash et al., 2012).

Training, however, can be effective in altering perceptions. Walters, Matson, Baer, and Ziedonis (2005) found training workshops effective for changing clinicians' knowledge of, attitudes toward, and self-confidence for implementing specific treatments. Even brief information presentations can change perceptions of evidence-based treatments (Benishek et al., 2010; Goddard, 2003). For example, addiction clinicians' beliefs about efficacy and willingness to use interventions aligned more closely with expert opinion after participants read materials describing each intervention's scientific support (Benishek et al., 2010). Clinicians increased their endorsement of CM as empirically supported and became more willing to implement CM in their own clinical care. Although the impact of these brief educational materials is encouraging, the authors note that room for improvement remains. Even after the favorable shift in attitudes about CM, more participants were willing to implement non-empirically supported treatments than CM (Benishek et al., 2010). More extensive training opportunities may have even greater impact on perceptions, including shifting the perception of CM's relative advantage compared to other treatments.

Importantly, in 2011, the Department of Veterans Affairs (VA) Mental Health Services office sponsored the largest known nationwide implementation effort of CM. The VA recognizes CM as an evidence-based treatment in its policy on the treatment of veterans with SUDs (VHA Handbook 1160.01, 2008). Noting that CM was rarely implemented among veterans with SUDs as part of clinical care, the VA issued a memorandum encouraging the use of CM in all intensive outpatient SUDs programs (IOPs). The VA supported training, initial implementation, and post-training coaching in over 100 outpatient VA SUDs treatment programs throughout the country. Clinical care dollars were provided to support the implementation of a CM protocol, with amounts varying depending on the size of program. Identified clinics were invited to one of four CM training workshops hosted by the VA. Each clinic selected one or two clinical leaders to represent their program at the training, with the intent of these individuals overseeing the design and implementation of a CM program in their home clinic.

This experience provided an unprecedented opportunity to evaluate the impact of CM training workshops on changes in knowledge of and attitudes toward CM. We hypothesized that attending the CM training workshops as part of this initiative would increase knowledge about behavioral principles related to CM interventions. We also hypothesized that training participation would positively influence attitudes toward CM. Specifically, we expected perceptions of general and training-related barriers to decrease following training, while positive attitudes toward CM would increase. Last, we examined predictors of workshop attendees' readiness to implement CM in their home clinics, including demographic and clinical characteristics and post-training knowledge and attitudes toward CM.

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2. Materials and methods

Below, we describe the training workshops and attendees. However, we refer readers to Petry et al. (unpublished) for elaboration on the background of the VA's efforts to introduce and encourage implementation of CM within its SUDs treatment programs.

2.1 Participants

Workshop attendees were clinical leaders or their designees from VA SUDs treatment programs. Programs were invited to participate if they had provided at least one week of IOP or equivalent services (i.e. 3 hours of clinical services at least 3 days per week) to at least 50 patients in the 12-month period from10/1/2009 through 09/30/2010. Clinical care dollars to fund CM costs were provided to clinics that served 50 or more patients in the prior year. The funds and associated memorandum were distributed prior to the trainings. The VA required that these funds be obligated within the fiscal year for CM-related expenses (i.e., reinforcers, urine toxicology tests, and CM materials such as fishbowl), but no deadline for implementation was prescribed. An additional 7 programs participated in the training because they either were planning or had recently implemented an IOP; however, these 7 programs did not qualify for the CM-specific funds. Of 115 programs invited, 113 (98%) sent 1 or more clinical leaders or designees to a training.

Clinical leaders or designees (N = 187 total) attended one of the four regional CM training workshops. Of the 187 attendees, unique key identifiers matched on the pre- and post-training surveys for 159 participants (85.0%). Remaining pre- and post-training surveys did not have a match either because the participant did not stay throughout the entire CM training, did not fill out the questionnaire at both time points, or failed to use identical codes on both versions; the non-matched surveys were excluded from analyses. Analyses that follow are limited to the 159 participants with data from both time points.

Table 1 lists the demographic and clinical characteristics of the workshop attendees. No differences were observed in demographic or clinical characteristics, prior experience with CM, extent of prior CM training, or change scores for CM knowledge and beliefs across the four training sites. As such, participants' data were collapsed for ease of interpretation and to increase statistical power for analyses. Attendees were well-educated (84% with a master degree or higher) and experienced (49% with more than 10 years in the field). The majority (79%) were not in recovery from an addiction. Most attendees (67%) had no prior experience with CM.

2.2 Materials

Participants completed demographic and background questions, including items about prior CM experience and prior training in CM. Participants also completed a 20-item multiple-choice knowledge test (see Petry & Stitzer, 2002) and the Contingency Management Beliefs Questionnaire (CMBQ; Rash et al., 2012). The knowledge test assessed familiarity with basic behavioral principles (e.g., priming, positive reinforcement) and concepts related to CM (e.g., behavioral parameters associated with effectiveness of CM interventions). Examples of questions included: 'Why is onsite urine testing for drug abuse preferable to sending urine samples to an outside laboratory?' and 'Why are escalating draws provided when patients achieve longer periods of abstinence?' The knowledge test was sensitive to change following CM training in our prior studies (Petry et al., 2012ab; average change = 5.0 to 6.8 more items correct).

The CMBQ contains 35 statements rated on a 5-point scale according to how influential the item is to the clinician's decision to adopt or continue using CM. Factor analyses of the CMBQ suggested a three factor structure (general barriers, training-related barriers, and

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CM-supportive statements) that was stable and reliable (Rash et al., 2012). The general barriers subscale includes items related to time and cost demands of implementing CM, as well as clinical concerns such as 'CM doesn't address the underlying cause of addiction.' Training-related barriers pertain to lack of training opportunities and qualified supervision, as well as concerns about organizational support. The CM supportive statements relate to perceived benefits of CM (e.g., 'CM helps clients get sober so that they can work on other aspects of treatment'). Workshop attendees were asked to complete the questionnaires before attending the workshop and submitted the packets upon arrival at the workshop.

Following the training, attendees again completed the CMBQ and the knowledge test, as well as a workshop evaluation form; these forms were submitted to an administrative assistant as participants left the training. The evaluation form included several feedback items (i.e., satisfaction, willingness to recommend, preparedness to implement). Training satisfaction ratings ranged from 1 ('very dissatisfied') to 7 ('very satisfied'). Willingness to recommend the training was similarly rated on 7-point scale, ranging from 'definitely would not' to 'definitely would' recommend the training to others. We also asked attendees about their perception of the proportion of therapists who could correctly implement CM without training, with a response scale ranging from 1 ('none') to 7 ('all'). Preparedness to implement ranged from 1 ('not at all') to 7 ('extremely well').

2.3 Procedure

The first (CR) and last (NP) authors led four regional CM training workshops. The number of completed questionnaires from each training site was: Connecticut, $n = 34$; Illinois, $n = 47$; South Carolina, $n = 45$; Colorado $n = 33$. The other authors, as well as additional VA representatives, were available throughout the training to provide input on system-level issues and potential barriers specific to the VA. Each 1 and ½ day training consisted of three general areas: 1) background and efficacy of CM, 2) designing a CM program, and 3) implementation issues. Each of these issues is described in detail in Petry (2012). Briefly, the first section covered the basic behavioral principles that serve as the foundation for CM interventions, the distinction between the rewards as typically offered in SUDs treatment program and CM, and an overview of the research supporting CM interventions. The second section focused on design features, including selecting the target behavior and choosing reinforcers. This section also highlighted behavioral parameters (e.g., frequency, immediacy, magnitude of reinforcement, escalation and resets) of effective reinforcement schedules. The last section centered on the practical aspects of implementation, including: 1) choosing a population, 2) funding and calculating costs, 3) introducing CM to clients, 4) tracking client progress, and 5) establishing and monitoring adherence and competence.

The workshop format combined didactics, video and live demonstrations, practice role-plays, small and large group discussion, and opportunities to design an initial CM program with feedback from workshop leaders. The goal of the training was to provide attendees with the necessary knowledge and resources to design and implement CM within the home programs. Petry (2012) provides examples of the handouts used in these workshops. Participants received a manual describing CM delivery with clinical vignettes (Ledgerwood & Petry, 2010). The manual included Petry et al.'s (2010) CM Competence Scale.

2.4 Data analysis

We evaluated changes from pre-training to post-training in the three CMBQ subscales and the knowledge test using paired *t*-tests. We used an ordered logit regression model in SPSS (v.19) to evaluate potential predictors of the preparedness to implement CM item from the post-training evaluation form. The criterion variable, post-training preparedness to implement, was recoded from seven to four categories due to low cell frequencies in the

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lower end of the scale. We combined the 'not at all', 'very little', 'less than needed', and 'somewhat' prepared categories, while the 'good', 'very well' and 'extremely well' categories remained unchanged. Predictors included background and clinical characteristics associated with evidence-based treatment adoption in other reports (McGovern et al., 2004) and with perceptions of CM as measured by the CMBQ (Rash et al., 2012) and other questionnaires (Ducharme, Knudsen, Abraham, & Roman, 2010; Kirby et al., 2006). Categorical predictors included recovery status (not in recovery [referent], in recovery, prefer not to answer), personal therapeutic approach (CBT versus other), prior CM experience (none versus any), years experience in the field (1 year or less [referent], 2-5, 6-10, 11-20, more than 20 years), and extent of prior CM training (none [referent], less than 1 hour, 1-2 hours, 3-5, 6-10, more than 10 hours). Post-training CMBQ subscales scores and post-training CM knowledge test scores were entered as continuous predictors. No differences in the dependent variable, preparedness to implement CM, were noted across training sites. Given the lack of differences across training sites and in consideration of the number of predictors in the model, site was not included as a covariate.

3. Results

3.1 Training evaluation

Average ratings of the training satisfaction ($M = 6.14$, $SD = 1.01$) and willingness to recommend the training items ($M = 6.28$, $SD = 1.08$) were high on the 7-point scale (6= 'satisfied'/ 'would most likely recommend' and 7 = 'very satisfied'/ 'definitely would recommend'). Attendees had low confidence in other clinicians' ability to implement CM correctly without training ($M = 2.57$ on a scale of 1 to 7, $SD = 1.38$). Preparedness to implement CM following the training averaged 5.46 ($SD = 0.99$; 5 = 'good' and 6='very well'). 3.2 Impact of training

We examined changes in knowledge scores and the three CMBQ subscales using paired *t*-tests. Table 2 presents the means, standard deviations, and test values for each comparison. Post-training knowledge about behavioral principles and CM protocols increased significantly from pre-training values ($p < .001$). Both CMBQ barriers subscales (general and training) decreased significantly post-training ($p = .002$ and $p < .001$, respectively), suggesting workshop attendees perceived fewer influential barriers to CM implementation following training. Attendees also increased their endorsement of CM-supportive statements pre- to post-training ($p < .001$).

Because changes in the CMBQ subscales were significant, post-hoc tests examined item-level changes to identify specific beliefs affected by the workshop. For the general barriers subscale, significant (ps < .05) decreases in endorsement occurred in 9 of the 17 subscale items. The most prominent of these decreases included concerns about a) clients selling or trading items for drugs (mean change = -0.63 on a 5 point scale), b) reinforcing abstinence when other treatment goals are unmet (e.g., attendance; -0.63 change), and c) what happens once the contingencies are withdrawn (-0.60 change), d) CM undermining internal motivation (-0.48 change), e) the applicability of CM's research to everyday clinic populations (-0.47 change), and f) CM not addressing the underlying cause of addiction (-0.41 change). Although the general barriers subscale scores significantly decreased overall from pre- to post-training, we nevertheless observed significant increases in attendees' endorsement of concerns about time (+0.64 change) and work (+0.64 change) demands related to implementing CM. For the training-related subscale, desire for more training (-1.65 change), feeling unqualified to administer CM (-0.99 change), and lack of qualified supervisors (-0.43 change) decreased significantly (ps ≤ .001) from pre -to post-training. Significant increases (ps < .05) in pro-CM beliefs were present for 9 of the 11 subscale items. The largest mean increases included items related to CM's focus on the good in

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clients' behavior (+0.38 change), utility in targeting abstinence (+0.35 change), and CM's ability to keep clients engaged in treatment long enough to learn valuable skills (+0.34 change).

3.3 Predictors of preparedness to implement

The ordered logit regression model predicting post-training preparedness to implement CM was significant ($p < .001$), and fit indices indicated that the model adequately represented the data (i.e., deviance and chi-square both non-significant; no evidence of significant overdispersion; proportional odds assumption not violated). Table 3 presents the ordered log-odds regression coefficients and odds ratios for each predictor. Two of the CMBQ subscales were significantly associated with workshop attendees' preparedness to implement CM within their home clinics. The pro-CM subscale was positively associated with preparedness, with a one-unit increase in the pro-CM subscale score corresponding to an increase of 1.56 in the ordered log-odds of being in a higher preparedness category ($p < .001$). Endorsement of training-related barriers was negatively associated with preparedness; a one-unit increase in training-related barriers was associated with a decrease of 1.28 in the ordered log-odds of being in a higher category of CM preparedness ($p < .001$). Endorsement of the general CM barriers subscale as a correlate of preparedness to implement CM trended toward significance with a positive association; a one-unit increase in general CM barriers was associated with an increase of 0.78 in the ordered log-odds of being in a higher category of preparedness to implement CM ($p = .05$). None of the demographic or prior CM experience or CM training variables impacted preparedness to implement CM.

4. Discussion

This study evaluated the impact of a 1 and ½ day CM training workshop among VA clinical leaders or their designees offered the opportunity and institutional support to implement CM in outpatient SUDs clinics. The workshop significantly increased CM-related knowledge and was well-received by attendees, who valued the training as important for implementation of effective CM protocols. Workshop participation was associated with change in attendees' perceptions related to CM, and these perceptions emerged as key correlates of post-training preparedness to implement CM. Results suggest that CM training workshops can be an effective avenue for providing the knowledge base necessary for proper implementation of this evidence-based treatment, as well as changing attitudes toward CM.

Prior studies (Cameron & Ritter, 2007; Henggeler et al., 2008a; Kirby, Benishek, Dugosh, & Kerwin, 2006; Rash et al., 2012) identified a number of barriers unique to CM, including concerns that CM does not address the underlying cause of addiction and that CM might undermine internal motivation for abstinence. Fortunately, these misperceptions appear amenable to change. The review of item-level changes suggests that the endorsements most affected by the training were also identified by Rash et al. (2012) as among the most influential barriers to CM adoption. For example, in Rash et al. (2012), concern about what happens once contingencies are withdrawn was one of the highly endorsed general barriers. Concerns that clients will immediately return to using substances after the CM program are common and may be in part driven by early experiments that used non-treatment seeking populations, short contingency periods, and no platform therapy. However, the Prendergast et al. (2006) meta-analysis found significant effects of CM on abstinence outcomes extending beyond the end of treatment. Petry (2010) also notes that one of the most consistent predictors of abstinence at long-term follow-up is the longest duration of abstinence achieved during treatment, and CM consistently outperforms platform therapies in engendering long periods of abstinence.

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That these perceptions of CM are malleable is encouraging. Ducharme et al. (2010) and Rash et al. (2012) found a positive effect of extent of prior CM training on attitudes toward CM. This study suggests that these associations are not merely an artifact of self-selection, such that clinicians who are more interested in CM pursue more training experiences in CM. Rather, the current findings and those of Benishek et al. (2010) indicate that training experiences can have a measurable impact on attitudes and provide support for the efficacy of these initiatives in CM dissemination. Such training and educational efforts may be particularly important for CM given the number of misconceptions about this intervention that persist among community clinicians.

None of the demographic or clinical predictors were significantly related to post-training CM implementation preparedness. Instead, post-training perceptions of CM emerged as significant correlates of preparedness. Pre-existing beliefs about CM may outweigh clinician characteristics, including recovery status or 12-step orientation, in terms of influence on intentions toward CM implementation. However, we note that representation of those in recovery (15%) and those endorsing a 12-step approach (6%) was low in our sample. National averages estimate that about 30-57% of clinicians are in recovery (Knudsen, Ducharme, & Roman, 2006; McNulty, Oser, Johnson, Knudsen, & Roman, 2007; Stoffelmayr, Mavis, & Kasim, 1998) and 12-step approaches are quite common among community clinicians (60-75%; Roman & Johnson, 2004ab). Further, some studies (Ducharme et al., 2010; Knudsen, Ducharme, & Roman, 2007; McGovern et al., 2004) have found clinicians who endorse these characteristics to be less open to incorporating new treatment approaches. Future studies will need to evaluate whether beliefs about CM will remain strongly associated with preparedness to implement in heterogeneous samples of SUDs treatment clinicians.

The associations of perceived training-related barriers and positive impressions of CM with preparedness to implement CM were in the expected directions, such that lower perceived training barriers and higher positive impressions predicted higher preparedness to implement. However, the association between perceived general barriers and preparedness unexpectedly trended in a positive direction. As noted above, endorsement of the general barriers subscale decreased overall pre- to post-training, but ratings on some individual items increased. It is possible that awareness of practical barriers, including those related to time and work demand, increases as clinicians move toward readiness to implement.

Following the training, attendees expressed moderate levels of self-confidence to implement CM on their own. This tempered confidence suggests a reasonable level of caution about implementing a new intervention and may prompt clinicians to seek continued training opportunities. Miller and Mount (2001) cautioned that too high post-training self-confidence may curb desire for additional training, a worrisome finding given that clinicians' self-reported proficiency levels are often not related to actual skill execution (Beidas & Kendall, 2010; Miller & Mount, 2001). For CM, we have found post-training exercises, including practice role-plays and taped patient sessions with feedback, vital in building competence in CM delivery. Therapist competence is related to patient outcomes (Petry et al., 2010; 2012b), and periodic feedback may be necessary for sustaining competent CM delivery beyond initial training and supervision phases (Andrzejewski, Kirby, Morral, & Iguchu, 2001; Petry et al., 2012b). Intervention quality will be an important issue to address as CM is incorporated into routine clinical practice (Olmstead, Abraham, Martino, & Roman, 2012), especially given beliefs among clinicians that they can effectively implement evidence-based treatments, including CM, without training (Benishek et al., 2010).

This study included a relatively large, national sample; however, several factors may impact the sample's representativeness. The trainings were limited to VA personnel; the sample was

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well-educated and relatively few identified as in recovery or as using primarily a 12-step approach. Our sample is similar to demographics from addictions workforce surveys (Gallon, Gabriel, & Knudsen, 2003; Mulvey, Hubbard, & Hayashi, 2003) with respect to gender distribution and years of experience in the field. However, our sample differed with respect to education level (47% with a doctoral degree in our sample compared to 7% in Mulvey et al.), which may reflect the VA's focus on inviting clinical leaders to the trainings. Self-selection bias may also be an issue for this study. Individuals who had prior interest in CM may have been more likely to be selected as representatives of their clinic (or to complete the survey), resulting in a sample that may be more interested in and more receptive to CM than other samples of clinicians.

Further limitations include the lack of a comparison condition for the training approach (e.g., manual-only, web-based) and no assessment beyond the immediate post-training period. We are encouraged that a single training workshop had a significant impact on decreasing perceived barriers and increasing pro-CM endorsement; however, future studies will need to examine whether these attitudinal changes are sustainable. Studies comparing training formats will also be needed (e.g., Henggeler, Sheidow, Cunningham, Donohue, & Ford, 2008b). Web- or manual-based formats may remove time or cost-related barriers for clinicians, but the impact of these CM training formats has not yet been examined.

Additionally, the anonymous nature of the data obtained at the training impacted this study. We purposefully did not ask trainees to identify their clinic to maintain confidentiality and to encourage honest feedback of the workshop experience and perceptions of CM. VA leaders attended each workshop and the VA initiated the CM roll-out. We did not want attendees' responses to be inhibited by concerns about expressing disagreement. However, this practice prevented analyses that accounted for clustering of attendees within programs and also obviated analyses of whether the changes in beliefs were sustained long after the training and whether changes in beliefs predicted implementation or other behavioral measures of skill in implementing CM. Although this study is limited by the inability to link survey responses to long-term or behavioral outcomes, we monitored the number of clinics that implemented CM. To date, 70% of the 115 clinics invited to the trainings have implemented CM (Petry et al., unpublished). Future work is necessary to evaluate if CM beliefs or knowledge predict behavioral outcomes. We also note that this study's findings must be viewed within the context of a top-down implementation effort in which training, support, and funds were provided.

Results of this study suggest that training in CM can increase knowledge necessary to implement the intervention, as well as change misconceptions about CM that may impede adoption efforts. This samples' pre-training endorsement of misperceptions about CM is notable in light of their interest in attending a CM training workshop, suggesting that even the most receptive of clinicians maintains reservations about CM's fit in clinical practice. That these perceptions can be successfully addressed in trainings is very promising, particularly as these beliefs are associated with readiness to implement CM in this study. Dissemination materials that address barriers and misperceptions may increase clinical interest and speed uptake of this evidence-based intervention within routine clinical practice, thereby improving patient outcomes.

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Table 1

Background Characteristics of Workshop Attendees (N = 159)

Background characteristics	Percent (*n*)
Male	50 (80)
Education	
Doctorate-level degree (e.g., PhD, PsyD, MD)	47 (75)
Master-level degree (e.g., MA, MS, MPH)	37 (59)
Bachelor-level degree (e.g., BA, BS, BSW)	10 (15)
Other	6 (10)
Years experience	
1 year or less	3 (5)
2-5 years	24 (38)
6-10 years	24 (38)
11-20 years	29 (46)
20+ years	20 (32)
Recovery status*	
Not in recovery	79 (123)
In recovery	15 (15)
Prefer not to answer	6 (9)
Personal therapeutic approach*	
12-step	6 (9)
Cognitive, behavioral, or cognitive-behavioral	41 (63)
Motivational	10 (15)
Relapse prevention	8 (13)
Harm reduction	3 (4)
Psychodynamic	1 (2)
Eclectic	27 (41)
Other	4 (6)
Prior CM training*	
None	48 (71)
Less than 1 hour	8 (12)
1-2 hours	16(23)
3-5 hours	17(25)
6-10 hours	4 (6)
More than 10 hours	7 (10)
No prior CM experience*	67 (102)

Notes.

*Missing data (Recovery status, 3 cases; Therapeutic approach, 6 cases; Prior training, 12 cases; Prior experience, 7 cases). CM = contingency management.

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Table 2

Pre- and Post-training Scores of Workshop Attendees (N = 159)

	Max score	Pre-training M (SD)	Post-training M (SD)	Paired t (df)	p	d
Knowledge scores	20	10.56 (3.19)	16.15 (2.79)	23.51 (157)	<.001	1.88
CMBQ subscale scores						
General barriers	4	2.31 (0.62)	2.16 (0.67)	-3.14 (157)	.002	0.26
Training-related barriers	4	2.88 (0.87)	2.14 (0.79)	-9.30 (157)	<.001	0.74
Pro-CM	4	3.77 (0.72)	4.02 (0.70)	4.69 (157)	<.001	0.38

Notes. CM = contingency management. Conventions for Cohen's *d:* small = 0.20, medium = 0.50, large = 0.80.

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Table 3

Predictors of Preparedness to Implement CM

Predictor	B	Odds Ratio (95% CI)	Chi Square	*p* value
Years experience in addiction field (referent = 1 year or less)				
2-5 years	-1.12	0.33 (0.03-3.08)	0.96	.33
6-10 years	-0.63	0.54 (0.06-5.25)	0.29	.59
11-20 years	-1.18	0.31 (0.03-2.97)	1.04	.31
More than 20 years	-1.08	0.34 (0.03-3.45)	0.84	.36
Recovery status (referent = not in recovery)				
In recovery	-0.18	0.84 (0.30-2.32)	0.12	.73
Prefer not to answer	0.14	1.15 (0.27-5.02)	0.04	.85
Cognitive, behavioral or cognitive-behavioral therapy as primary therapeutic approach (compared to any other approach)	0.29	1.33 (0.65-2.73)	0.61	.44
Extent of prior CM training (referent = none)				
Less than 1 hour	-0.01	0.99 (0.29-3.42)	0.00	.99
1-2 hours	-0.26	0.77 (0.29-2.10)	0.26	.61
3-5 hours	0.90	2.47 (0.83-7.34)	2.64	.10
6-10 hours	-0.23	0.80 (0.16-3.88)	.08	.78
More than 10 hours	-1.03	0.36 (0.08-1.55)	1.89	.17
Prior CM experience (any versus none)	0.35	1.42 (0.65-3.11)	0.78	.38
Post-training CMBQ subscale scores				
General barriers	0.78	2.19 (0.99-4.84)	3.71	.05
Training-related barriers	-1.28	0.28 (0.15-0.53)	15.11	**< 001**
Pro-CM	1.56	4.74 (2.43-9.24)	20.80	**< 001**
Post-training knowledge scores	0.12	1.13 (0.99-1.29)	3.04	.08

Note. CI = confidence interval, CM = contingency management, CMBQ = Contingency Management Beliefs Questionnaire.