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Predictive validity of addiction treatment clinicians' post-training contingency management skills for subsequent clinical outcomes

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ABSTRACT

In the context of a contingency management (CM) implementation/effectiveness hybrid trial, the post-training implementation domains of direct-care clinicians ($N = 19$) were examined in relation to a targeted clinical outcome of subsequently CM-exposed clients. Clinicians' CM skillfulness, a behavioral measure of their capability to skillfully deliver the intended CM intervention, was found to be a robust and specific predictor of their subsequent client outcomes. Analyses also revealed CM skillfulness to: (1) fully mediate an association between a general therapeutic effectiveness and client outcome, (2) partially mediate an association of in-training exposure to CM and client outcome, and (3) be composed of six component clinical practice behaviors that each contributed meaningfully to this behavior fidelity index. Study findings offer preliminary evidence of the predictive validity of post-training CM skillfulness for subsequent client outcomes, and inform suggestions for the design and delivery of skills-focused CM training curricula for the addiction treatment workforce.

1. Introduction

The transport of empirically-supported behavior therapies for routine use in addiction care settings remains a challenge. This shared undertaking involves the therapy purveyors who promote and train others to use particular therapies, community treatment programs as intended settings wherein those therapies would be implemented, and the treatment programs' direct-care clinicians who would serve as primary agents of therapy implementation (Beidas, Koerner, Weingardt, & Kendall, 2011). Dissemination efforts necessarily rely on purveyors to make information available about a focal therapy so community treatment programs and their staff are aware of its conceptual basis and empirical support (Hartzler & Rabun, 2014). On this front, the field is progressing. Increased awareness of empirically-supported therapies in community settings has been fueled by large-scale efforts funded by the Substance Abuse and Mental Health Services Administration, like Addiction Technology Transfer Centers (www.nattc.org) and a National Registry of Evidence Based Programs and Practices (www.nrepp.samhsa.gov). Likewise, the findings of multisite effectiveness studies conducted in the National Institute on Drug Abuse Clinical Trials Network (Hanson, Leshner, & Tai, 2002) have promoted greater community awareness of empirically-supported therapies. However, greater awareness alone appears insufficient to prompt effective transport of promising behavior therapies to community settings, as adoption rates for a range of empirically-supported practices remain modest (Knudsen, Abraham, & Roman, 2011; Roman, Abraham, Rothrauff, & Knudsen, 2010).

Beyond treatment community awareness, challenges to behavior therapy dissemination include any number of issues at the level of individual direct-care clinicians. A prominent issue involves fidelity, or clinician capability to skillfully deliver a therapy as intended (McHugh & Barlow, 2010) and thereby offer therapy-exposed clientele an opportunity to approximate the therapeutic outcomes reported in corresponding efficacy trials. Efforts to prepare direct-care clinicians to effectively deliver such behavior therapies encompass a broader struggle across the healthcare field with questions about sufficient therapy promotion, training, and supervision methods (Beidas & Kendell, 2010; Herschell, Kolko, Baumann, & Davis, 2010). Answers to such questions may implicate clinicians' professional background (i.e., educational attainment, program role, setting tenure), level of exposure to the therapy via structured training or other means, and impact of such therapy exposure on clinician-level implementation domains (i.e., conceptual knowledge of therapy principles, self-efficacy to skillfully deliver the therapy, attitudes toward therapy-specific precepts, adoption readiness). Unfortunately, the relative weight to be given these clinician-level implementation domains in structured dissemination efforts is ambiguous. This places therapy purveyors in a challenging position about where to focus time-limited efforts when engaging direct-care clinicians in therapy training processes.

One widely-studied behavior therapy for substance abusers is contingency management (CM), encompassing a family of approaches informed by principles of behavioral reinforcement (Higgins, Silverman, & Heil, 2008). Petry (2012) notes as core CM tenets that: (1) a focal, desired patient behavior be monitored, (2) timely provision of tangible,

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positive reinforcers when the behavior occurs, and (3) withholding of reinforcers when the behavior does not occur. Meta-analyses show reliable efficacy across procedurally-diverse CM methods (Benishek et al., 2014; Lussier, Heil, Mongeon, Badger, & Higgins, 2006; Prendergast, Podus, Finney, Greenwell, & Roll, 2006). Yet, community treatment interest in CM is limited relative to alternative behavior therapies (Haug, Shopshire, Tajima, Gruber, & Guydish, 2008; McGovern, Fox, Xie, & Drake, 2004). Interest in CM appears moderated by clinician background variables, with greater educational attainment, a supervisory setting role, and lengthier employment tenure all predictive of greater interest (Aletraris, Shelton, & Roman, 2015; Hartzler et al., 2012; Kirby, Benishek, Dugosh, & Kerwin, 2006; McCarty et al., 2007). Further, exposure to CM seems to encourage clinician interest in its adoption (Aletraris et al., 2015; Ducharme, Knudsen, Abraham, & Roman, 2010). Nevertheless, there is much still to learn about how such interest translates into consistently skillful delivery of CM interventions that improve targeted clinical outcomes.

Extant literature from the addiction treatment community on impacts of CM training for direct-care clinicians is limited with respect to implementation domains (i.e., therapy knowledge, skillful delivery, attitudes, self-efficacy, adoption readiness). A nationwide training effort with VA program leaders suggests that multi-day workshop exposure promotes knowledge and conducive attitudes (Rash, DePhillipis, McKay, Drapkin, & Petry, 2013), though unfortunately excluded direct-care clinicians from those VA programs. Success of later VA implementation attempts, aided by federal funding support and presumably involving untrained direct-care clinicians, also is unknown (Petry, DePhillipis, Rash, Drapkin, & McKay, 2014). More is known from a single-site trial in which Hartzler et al. (2014) demonstrated a skills-focused training with an intact group of direct-care clinicians led to robust, durable improvements in CM delivery skill, knowledge, and adoption readiness. That all of the CM-trained clinicians in this single-site trial met and maintained a suggested competency benchmark for delivery skill is encouraging, and offers a unique opportunity to examine questions about effective CM dissemination via a set of exploratory analyses. One such question concerns the extent to which CM delivery skill and other post-training clinician-level implementation domains may predict clinical improvement in targeted outcomes of CM-exposed clientele. Another question is how clinician background attributes, broader clinical acumen, and level of therapy exposure contribute to the development of post-training therapy expertise. Answers to such questions are paramount to understanding of effective CM dissemination processes, given published report of well-intentioned yet ultimately unsuccessful implementation attempts undermined or discontinued after community settings encountered clinician-involved logistical, procedural, or philosophical challenges (Tuten, Svikis, Keyser-Marcus, O'Grady, & Jones, 2012; Walker et al., 2010).

Design features of the aforementioned trial by Hartzler et al. (2014) allow for further examination of these links between clinicians' post-training implementation domains and subsequent therapeutic effects among their CM-exposed clientele. In this trial, direct-care clinicians were afforded voluntary opportunity to implement a contextualized intervention with their caseload clients over a 90-day period immediately following the CM training. Thus, trial data enable scrutiny of the predictive validity of post-training implementation domains for subsequent clinical outcomes among the CM-exposed clientele. Further, the trial also gathered baseline data about the direct-care clinicians, allowing additional examination of the extent to which their background attributes (i.e., educational attainment, program role, setting tenure, common psychotherapy skills) influence such associations. Likewise, available clinician data also specified their level of CM exposure via a range of potential professional activities prior to training and their attendance rate during the identified training. Herein, we examine the interplay of this collection of clinician variables in predicting clinical effectiveness of a CM intervention.

2. Materials and method

2.1. Parent trial design

All trial procedures were approved by a university-based institutional review board, and these as well as trial outcomes are comprehensively described elsewhere (Hartzler et al., 2014). As for design, an implementation/effectiveness hybrid 'type 3' trial (Curran, Bauer, Mittman, Pyne, & Stetler, 2012) was modeled insofar as the primary focus was formal testing of a set of implementation strategies for a contextualized CM intervention with secondary focus on the corresponding clinical effectiveness later observed during setting implementation. Specific trial design features included voluntary recruitment of the setting's direct-care clinicians to participate in a CM training process; serial training outcome assessments completed by these clinicians prior to, just after, and 3 months following training; and clinician delivery of a contextualized CM intervention with targeted clients on their caseload over a 90-day provisional implementation period. Among the previously-reported trial outcomes are robust immediate impacts of training on clinicians' CM delivery skill, knowledge, adoption readiness, and attitudes as well as significant clinical effects of the CM intervention on targeted outcomes ($d = .45–.53$, relative to historical controls) among the setting's CM-exposed clientele (Hartzler et al., 2014).

In the current report, the analytic work was exploratory in nature yet guided by a set of working hypotheses. First, post-training clinician implementation domains (outlined later in Materials and Method) were expected to be positively associated with the aggregated rate of counseling visit attendance (the target behavior for reinforcement) among CM-exposed clients on clinicians' caseload. Second, it was anticipated that clinicians' background attributes (i.e., education, program role, employment tenure, common psychotherapy skills) and level of CM exposure would be positively associated with their post-training implementation domains and the caseload-aggregated attendance rate of CM-exposed clients. Third, it was hoped these collective analyses may help explain interplay among clinician background attributes, CM exposure, and post-training implementation domains in ultimately influencing clinicians' caseload-aggregated attendance rate. Results of these collective analyses prompted subsequent examination of the contribution of CM-specific clinical practice behaviors to clinicians' overall CM skillfulness.

2.2. Collaborating treatment setting

The collaborating setting is a private, non-profit opiate treatment program (OTP) located in an urban area of a large northwestern United States city. The OTP has provided medication-assisted treatment to a diverse population of clientele for more than four decades, and maintains a census of approximately 1000 clients. In addition to opiate agonist medication, other core clinical services include individual and group counseling, case management and support services, access to psychiatric/medical care, and monthly drug screen urinalysis. The setting is affiliated with the NIDA Clinical Trials Network, and prior to its involvement in the parent trial had participated in multisite trials of pharmacotherapies, alternative behavior therapy approaches, and a range of other federally-funded research.

2.3. Contextualized CM intervention

The CM intervention and its collaborative design process are fully described elsewhere (Hartzler, 2015; Hartzler et al., 2014). Briefly, the CM purveyor oriented the OTP director to aforementioned CM tenets, and invited designation of intervention features according to setting needs, interests, and operating budget. Director-designated features included: (1) a target client population in their initial 90 days of services, (2) a target behavior of attendance at weekly counseling visits, (3) $5 gift cards to local vendors as behavioral reinforcers, and (4) a 'point-

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