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Climate for Innovation, 12-Step Orientation, & Tobacco Cessation Treatment

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Abstract

This study examined the relationship between (1) three indicators of climate for innovation (clinician skills, absence of program obstacles, policy-related incentives) and adoption extensiveness of both behavioral treatments for tobacco cessation (TC) and system-level support for TC in substance use disorder treatment programs, (2) a program's 12-step treatment orientation and adoption extensiveness, and (3) whether 12-step treatment orientation moderates the relationship between climate for innovation and adoption extensiveness. Data were obtained from a random sample of 1,006 program administrators. Hierarchical regression results showed that both absence of program obstacles and policy-related incentives are positively related to adoption extensiveness. Twelve-step treatment orientation is neither related to adoption extensiveness nor a moderator of the relationship between climate for innovation and adoption extensiveness. Although the adoption of both behavioral treatments for TC and system-level support for TC is not extensive, we conclude that a 12-step treatment orientation neither hampers nor promotes adoption extensiveness.

Keywords

smoking treatment; evidence-based practices; addiction treatment; adoption of innovation; 12-step orientation

1. Introduction

Since 2000, national guidelines encourage all clinicians, including those working in substance use disorder (SUD) treatment programs, to adopt evidence-based practices (EBPs), such as behavioral treatments, system-level support, and pharmacotherapy, for the treatment of tobacco dependence (Fiore et al., 2008; Kalman, Morissette, & George, 2005;

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Richter & Arnsten, 2006). The guidelines are important considering that between 65% and 87% of individuals in SUD treatment smoke (for a review of the literature, see Guydish et al., 2011) compared to 21% in the general adult population (Centers for Disease Control and Prevention, 2013). Nonetheless, adoption of tobacco cessation (TC) EBPs in SUD treatment programs is a slow process that is characterized by a non-linear and non-uniform adoption across treatment programs (e.g., not all aspects of EBPs might be adopted, not all programs adopt EBPs at the same time or with the same extensiveness) (Fuller et al., 2007; Knudsen & Studts, 2011; Richter, Choi, McCool, Harris, & Ahluwalia, 2004; Rothrauff & Eby, 2010).

Several reasons may explain this low and slow adoption of TC EBPs. There is a known research-to-practice gap in the SUD treatment field with EBPs being slow to be integrated into routine practice (Fuller et al., 2007; Richter et al., 2004; Roman et al., 2011). Similarly, there is the “clinical lore” that is slow to debunk that tobacco is not a real drug and is too hard to treat alongside other addictions (Guydish, Passalacqua, Tajima, & Manser, 2007; Ziedonis, Guydish, Williams, Steinberg, & Foulds, 2006). Additionally, low adoption may reflect the smoking culture that still exists in some SUD treatment settings (McIlvain & Bobo, 2005; Reilly, Murphy, & Alderton, 2006).

A major contributor to these low TC adoption patterns may be due to the 12-step philosophy surrounding recovery that teaches people that their first and primary responsibility is sobriety from alcohol, illegal drugs, and non-prescription medications (Bobo & Husten, 2000; Rothrauff & Roman, 2011; White, 1998). It is further recommended that people solely focus on remaining sober from their primary SUD instead of making additional changes such as stopping smoking (Bobo & Husten, 2000; Kotz, 1993).

The empirical evidence regarding how 12-step treatment orientation relates to SUD treatment paints a complex picture. On one hand, there is evidence that a 12-step model is related to positive SUD patient treatment outcomes (Crits-Christoph et al., 1999; McAuliffe, 1990; National Institute on Drug Abuse [NIDA], 2012; Project MATCH Research Group, 1997). On the other hand, findings based on a program’s 12-step treatment orientation show negative relationships with adoption of EBPs (not specific to TC), particularly pharmacotherapy (e.g., Abraham, Rieckmann, McNulty, Kovas, & Roman, 2011; Bride, Abraham, Kintzle, & Roman, 2013; Rieckmann, Kovas, McFarland, & Abraham, 2011).

The current study focuses on the adoption of two EBPs for TC that are recommended in the national guidelines but rarely studied in SUD treatment—behavioral treatments for TC and system-level support for TC (Fiore et al., 2008). As SUD researchers are placing more emphasis on theoretical frameworks for selecting predictors of the adoption of EBPs, we use Klein and Sorra’s (1996) innovation implementation effectiveness framework to create a novel way of examining the relationship between various aspects of climate for innovation (i.e., clinician skills, absence of program obstacles, policy-related incentives) and adoption extensiveness of both behavioral treatments for TC and system-level support for TC. Additionally, because previous research has omitted behavioral treatments for TC and system-level support for TC in relation to a program’s 12-step treatment orientation, we investigate whether there are differences in the adoption extensiveness between programs that have a primarily 12-step treatment orientation and programs with a primarily non-12-step treatment orientation. Finally, we examine whether 12-step treatment orientation moderates the relationship between the climate for innovation and adoption extensiveness of both behavioral treatments for TC and system-level support for TC.

1.1. Behavioral Treatments for TC and System-Level Support for TC

Fiore et al. (2008) recommend the use of different types of behavioral treatments for TC and system-level support for TC to address the varied needs of tobacco users. For example, compared to individuals without SUDs, those with SUDs have a higher rate of tobacco use (Berggren et al., 2007; Centers for Disease Control and Prevention, 2007; Jackson, Sher, Wood, & Bucholz, 2003; Kalman et al., 2005; Martin, Rohsenow, MacKinnon, Abrams, & Monti, 2006), are more heavily dependent on tobacco products (Hughes, 2002; Sobell, 2002), and have more difficulty achieving TC (Hughes & Kalman, 2006).

Behavioral treatments for TC, which are conceptually distinct from system-level support (Abrams et al., 2003; Fiore et al., 2008), include approaches such as the use of the 5 A's (asking patients about their tobacco use, advising users to quit, assessing their willingness to quit, assisting in quitting, and arranging for follow-up care), enhancement of problem solving skills and skills training, combinations of counseling and pharmacotherapy, and on-going TC support and encouragement (Fiore et al., 2008; Kalman et al., 2005; Richter & Arnsten, 2006). In addition, it is recommended that behavioral treatments for TC are offered in various formats such as individual counseling, group counseling, telephone support, and/or a combination of formats (Fiore et al., 2008).

System-level support for TC is also necessary for the effective delivery of TC services (Fiore et al., 2008). System-level support can include organizational approaches such as ensuring that tobacco users are identified and documented, TC treatment is offered, staff are trained and have access to available resources to promote TC, staff are dedicated to providing TC treatment, and staff are supported and motivated to use EBPs to treat tobacco dependence (Fiore et al., 2008; Kalman et al., 2005; Richter & Arnsten, 2006).

1.2. Climate for Innovation and Adoption of Behavioral Treatments for TC and System-Level Support for TC

We utilize Klein and Sorra's (1996) theoretical framework on the adoption of innovations in organizational settings to examine various aspects of climate for innovation as predictors of adoption extensiveness of behavioral treatments for TC and system-level support for TC. We chose Klein and Sorra's model over other frameworks that may have utility in understanding the adoption and implementation of innovations (e.g., Fixsen, Naoom, Blasé, Friedman, & Wallace, 2005; Rogers, 2003) due to our interest in examining how specific organizational processes and management practices influence the adoption of TC.

Klein and Sorra's model is well established in the organizational science literature and has been used in numerous rigorous empirical studies to understand the adoption and implementation of a wide range of phenomena. This includes the implementation of safety performance standards (Mohaghegh & Mosleh, 2009), primary health care service delivery (Nembhard, Alexander, Hoff, & Ramanujam, 2009), information technology systems (Dong, Neufeld, & Higgins, 2008), and health promotion programs (Weiner, Lewis, & Linnan, 2009).

Klein and Sorra identify innovation adoption and implementation as "the process of gaining targeted employees' appropriate and committed use of an innovation" (p. 1055). They argue that the fundamental challenge for innovation adoption and implementation is to change organizational members' behavior so that they use the innovation on a day-to-day basis. In other words, implementation failure is the primary reason why organizational innovations do not have their intended benefits, and implementation happens only when employees are both motivated and able to execute the innovation. The model conceptualizes adoption and implementation effectiveness as a continuum that ranges from avoidance of the innovation

(nonuse) to meager and unenthusiastic use, to skilled and sustained use. This is consistent with our conceptualization of adoption extensiveness.

According to Klein and Sorra's theoretical framework, climate for innovation is one of the main factors that predict the adoption, implementation, and sustainability of an innovation. The three components of an organization's climate for innovation are employee skills that assist the innovation, absence of program obstacles to adopt and implement the innovation, and policy-related incentives that support the availability and use of the innovation. First, research has shown that individual *clinician skills* such as higher level of education, greater tenure in the SUD field, and more training are positively associated with the adoption of pharmacotherapy (e.g., Knudsen, Ducharme, Roman, & Link, 2005; Rieckmann et al., 2011). Similar findings have been reported for clinicians' attitudes toward pharmacotherapy use. Abraham et al. (2011) found that attitudes toward the adoption of naltrexone were more favorable among clinicians with at least a master's degree, who had medication-specific training, and had more years of experience in the field.

Second, individual factors that can be defined as *absence of program obstacles* to the adoption of EBPs such as non-profit status (e.g., Friedmann, Jian, & Richter, 2008; Richter et al., 2004), hospital affiliation and/or hospital-based standing (e.g., Friedmann et al., 2008; Knudsen & Studts, 2011), mental health services provision (e.g., Friedmann et al., 2008), and non-outpatient care (e.g., Knudsen & Studts, 2011; Ziedonis et al., 2006) are related to greater availability of TC pharmacotherapy than other SUD treatment programs.

Third, little is currently known about the relationship between *policy-related incentives* and adoption of EBPs. However, it seems reasonable to expect that incentives such as policies that reimburse treatment programs for providing TC-related services are linked to the adoption extensiveness of both behavioral treatments for TC and system-level support for TC. For instance, Fiore et al. (2008) note an association between restrictions on reimbursement for TC services and the use of more brief versus intensive interventions.

In addition to applying a theoretical framework, we use a different and somewhat unique approach to the creation of the three climate for innovation indicators by taking multiple variables for each indicator and combining them into three climate for innovation indices (i.e., we create formative measures): clinician skills, absence of treatment obstacles, and policy-related incentives. This approach differs from prior research in the SUD field that has generally examined single independent variables (e.g., education, program's profit status) as predictors of the adoption of EBPs, although not specific to behavioral treatments for TC and system-level support for TC. Creating indices gives us a new perspective of climate for innovation in relation to adoption of EBPs.

1.3. Adoption of EBPs in SUD Treatment Programs and 12-Step Treatment Orientation

No research to our knowledge has examined the relationship between adoption of behavioral treatments for TC and system-level support for TC and 12-step treatment orientation in SUD treatment programs. In contrast, a larger body of research exists on the adoption of pharmacotherapy and 12-step treatment orientation, while not specific to TC. One consistent finding is that 12-step treatment orientation (measured both at the organization level and clinician level) is related to less favorable attitudes toward pharmacotherapy use. For instance, a primarily 12-step treatment orientation to SUD treatment is associated with lower treatment program adoption of tablet naltrexone for treating alcohol use disorders (Oser & Roman, 2007, 2008), lower availability of disulfiram to treat a variety of SUDs including alcohol, cocaine, and opiates (Knudsen, Ducharme, & Roman, 2007), counselors' lower ratings of tablet naltrexone effectiveness and acceptability for treating alcohol use disorders

(Abraham et al., 2011), and social workers' lower acceptance of medication assisted therapy (Bride et al., 2013).

We were able to locate only one study that specifically examined the adoption of TC pharmacotherapy and 12-step treatment orientation. Rothrauff and Eby (2010) found that counselors who worked in SUD treatment programs with a greater 12-step treatment orientation were less knowledgeable about the adoption of TC medications (i.e., varenicline, bupropion, and nicotine replacement therapy) in their treatment programs than counselors who worked in treatment programs that adhered less to a 12-step treatment orientation.

The lack of empirical studies examining 12-step treatment orientation in relation to the adoption of behavioral treatments for TC and system-level support for TC in SUD treatment programs is a missed opportunity, because treatment programs and clinicians with a stronger 12-step treatment orientation tend to use behavioral treatments for TC more than pharmacological treatments (McGovern, Fox, Haiyi, & Drake, 2004). This may be because the use of pharmacotherapy goes against the principles of the 12-step treatment orientation that stresses abstinence and sobriety from all drugs (White, 1998).

Considered together, treatment programs may show different patterns of adoption of behavioral treatments for TC and system-level support for TC based on 12-step treatment orientation. There is some support in the literature outside of TC treatment that indicates that there may be a link between 12-step treatment orientation and use of behavioral treatments for TC. Ducharme et al. (2010) looked at SUD counselors' attitudes toward the adoption of motivational incentives/contingency management and found that a 12-step treatment orientation was a barrier to counselors' positive attitudes. We propose:

- H1** Climate for innovation (i.e., clinician skills, absence of program obstacles, policy-related incentives) will be positively related to adoption extensiveness of both behavioral treatments and system-level support for TC.
- H2** Treatment programs with a primarily 12-step treatment orientation will have lower adoption extensiveness of both behavioral treatments for TC and system-level support for TC than treatment programs with a primarily non-12-step treatment orientation.
- H3** The relationship between climate for innovation and adoption extensiveness of both behavioral treatments for TC and system-level support for TC will be moderated by treatment programs' 12-step treatment orientation.

2. MATERIALS and METHODS

2.1. Study Design and Sample

Data for this study were obtained from the Managing Effective Relationships in Treatment Services (MERITS III) project. MERITS III is a longitudinal project that was funded by the NIDA and is carried out by researchers affiliated with the University of Georgia. All procedures were approved by the University of Georgia's Institutional Review Board. The purpose of MERITS III is to examine the impact that SUD treatment program processes and management practices have on the adoption, implementation, and sustainability of TC services in SUD treatment programs.

The sampling frame for MERITS III was based on 11,153 treatment programs that were included in the Substance Abuse and Mental Health Services Administration (SAMHSA) 2010 National Directory of Federal, State, local government, and private facilities that offer substance abuse treatment services. SAMHSA required treatment facilities to be licensed, certified, or otherwise approved for inclusion in the Directory by their State substance abuse

agencies, and facilities to have responded to the 2009 National Survey of Substance Abuse Treatment Services (N-SSATS). Facilities were located across the US and encompassed all levels of care.

To screen for eligibility, all programs listed in the 2010 SAMHSA Directory were first assigned a random number. Then the data were sorted from the lowest to the highest number. Trained research assistants called treatment programs starting at the lowest number to screen and qualify them for eligibility. Whether a program was eligible for participation was based on the answers to a number of questions provided by program administrators. The treatment programs had to provide SUD counseling services in a community setting. In addition, programs that offered only methadone maintenance, Veterans administration programs, DUI educational programs, or those listed as Halfway Houses and only offered detoxification were ineligible.

In order to reach our target sample size of 1,000 programs that completed phone surveys, we had to contact approximately 5,000 programs to compile a list of 2,679 screened and qualified programs. Trained research assistants called the screened and qualified programs to conduct in-depth structured phone interviews with program administrators that took about 30 minutes to complete: 1,006 program administrators completed a survey, 171 did not complete a survey after repeated attempts, 422 refused to participate, and 944 could not be reached (i.e., phone disconnected, program closed). Thus, there were a total of 1,599 programs that were eligible for participation of which 1,006 program administrators completed a survey (62.91% basic response rate; see Gripp, Luloff, & Yonkers 1994 for basic response rate calculation) and 944 programs that were no longer eligible for participation. Once we reached our target sample size, the screening, qualifying, and interviewing process stopped. Treatment programs received \$150 for each completed interview.

Job titles of program administrators included Director (64.31%), Manager or Supervisor (15.41%), and Owner/President/VP/CEO (8.35%). The majority of treatment programs operated as non-profit entities (72.62%), were not affiliated with a hospital or other medical facility (82.59%), were not hospital-based (94.03%), offered mental health services (71.74%), and provided outpatient only treatment (57.93%). Almost half of treatment programs were accredited (48.21%). Nearly one quarter of them described their treatment orientation as primarily based on a 12-step model (23.73%) and 27.62% described themselves as primarily using cognitive behavioral therapy, 11.47% primarily using motivational enhancement therapy, and 37.19% as using an eclectic or other model. Approximately 70.47% ($SD = 29.93$) of patients seeking SUD treatment smoked. In addition, programs employed a mean of 2.29 ($SD = 3.17$) clinical supervisors and a mean of 9.27 ($SD = 12.93$) counselors.

Comparisons between the full 2009 N-SSATS sample and our randomly selected programs are limited to program characteristics that were measured in both samples. In our sample, 41.1% of programs were accredited by either JCAHO or CARF compared to 38% in N-SSATS, 5.97% were hospital-based compared to 12% that are hospital-based in N-SSATS, and 25% offered nicotine replacement therapy (NRT) compared to 19.3% in N-SSATS.

2.2. Measures

Adoption extensiveness of both behavioral treatments for TC and system-level support for TC—Based on the work of Abrams et al. (2003) and Fiore et al. (2008), behavioral treatments for TC and system-level support for TC are examined as separate indicators because they are conceptually distinct. Program administrators answered questions about the availability of 11 behavioral treatments for TC and the availability of

nine system-level support for TC at their treatment program (Fiore et al., 2008; see Table 1 for all items). The stem question was “Please indicate whether each treatment for TC is currently available in your treatment program.” Response options were 0 = *no* and 1 = *yes*. An index of adoption extensiveness of behavioral treatments for TC was created by summing the number of *yes* responses to the 11 TC behavioral treatments for TC questions. Adoption extensiveness of system-level support for TC was created by summing the number of *yes* responses to the nine system-level support for TC treatment questions.

Climate for innovation—*Clinician skills* were assessed with five items that encompass diverse skill areas as shown in Table 1. Responses to each item ranged from 0% to 100%. The clinician skills index was represented by the mean across these five items. *Absence of program obstacles* was measured with six items (see Table 1). Response options were 0 = *no* and 1 = *yes*. The absence of program obstacles index was created by summing the number of *yes* responses to the six items. *Policy-related incentives* to aid TC were measured with a four-item scale developed for this study (see Table 1). Responses were recorded on a Likert-type scale ranging from 1 = *not at all extensive* to 4 = *a great extent*. The policy-related incentives index was created by calculating the mean across the four items ($\alpha = .75$).

Control variable—We controlled for the percentage of patients seeking SUD treatment in their program who smoke, because previous research has shown a positive association with the availability of TC services (Friedmann et al., 2008). Responses ranged from 0% to 100%.

2.3. Data Analyses

Descriptive statistics were conducted to describe the individual items that comprised the adoption extensiveness of both behavioral treatments for TC and system-level support and climate for innovation (see Table 1). Comparisons on the individual items between programs with a primarily 12-step treatment orientation and primarily non-12-step treatment orientation were made using chi-square analyses for categorical data and general linear models (GLM) for continuous variables due to sample size differences (see Table 1). GLM were also run to examine mean differences in adoption extensiveness between treatment programs with a primarily 12-step treatment orientation and programs with a primarily non-12-step orientation to treatment in terms of behavioral treatments for TC, system-level support for TC, and climate for innovation (see Table 2).

Hierarchical multiple regression models were run separately for each dependent variable to test the hypotheses (see Table 3 for behavioral treatments for TC and Table 4 for system-level support for TC). Each climate for innovation index was centered at the mean to reduce multicollinearity issues when testing for the moderator effects. In model 1, we entered the control variable. Climate for innovation was added in model 2 (H1). In model 3, 12-step treatment orientation was entered (H2). In model 4, the interactions between 12-step treatment orientation and climate for innovation were entered (H3). Variance inflation factors were below 1.50, indicating no serious concerns regarding multicollinearity. List-wise deletion was used to handle missing data, which ranged from 2% to 6%. Data were analyzed using SAS 9.3.

3. Results

3.1. Descriptive Statistics of Individual Items

Table 1 provides descriptive information on the individual items that comprised the TC adoption extensiveness measures and climate for innovation measures, as well as a comparison by 12-step treatment orientation. Briefly, items that were adopted by the

majority (> 50%) of programs according to administrators regarding behavioral treatments for TC included providing self-help materials and having additional community resource referrals, and pertaining to system-level support included identifying all smokers at intake, providing counselor resources for TC treatments, and discouraging clinical staff from smoking. Pertaining to the climate for innovation items, the mean percentage of each of the four clinician skills items ranged from 48.20% to 73.62%. Absence of program obstacles items that were noted by the majority (> 50%) of program administrators were operating as a non-profit entity and offering mental health services. Finally, the mean of each of the four policy-related incentives ranged from 1.35 to 1.58.

Table 1 further shows that the adoption extensiveness of both behavioral treatments for TC and system-level support for TC generally did not significantly differ between programs based on their 12-step treatment orientation. Of the 20 adoption extensiveness items investigated, there were only two significant differences. Compared to programs with a primarily non-12-step treatment orientation, those with a primarily 12-step treatment orientation used fewer specific motivational interviewing techniques to enhance motivation for TC and more permitted smoking at the treatment program. In contrast, about half of the climate for innovation items significantly differed based on 12-step treatment orientation. Programs with a primarily 12-step treatment orientation versus programs with a primarily non-12-step treatment orientation reported a lower mean percentage of counseling staff with a master's degree, bachelor's degree, and total workforce with educational backgrounds in medicine, public health, psychology or related field; they also offered fewer mental health care services and more non-outpatient level of care; they further noted a lesser extent to which counselor time spent providing individually-based TC and group-based TC treatment was reimbursable.

As shown in Table 2, program administrators reported a mean adoption of 4.08 behavioral treatments for TC (range of 0–11) and a mean adoption of 3.68 system-level support for TC (range of 0–9). There were no statistically significant mean differences in adoption extensiveness of behavioral treatments for TC and adoption extensiveness of system-level support for TC between programs that used a primarily 12-step treatment orientation and other programs.

Also shown in Table 2 are findings regarding climate for innovation. Overall, treatment programs reported a mean of 60.39 on the clinician skills index (range of 0%–100%), a mean of 2.17 on the absence of program obstacles index (range of 0–6), and a mean of 1.44 on the policy-related incentives index (range of 1–4). Significant differences in climate for innovation between programs that used a primarily 12-step treatment orientation and programs that used a primarily non-12-step treatment orientation were found for clinician skills and policy-related incentives. Programs with a primarily 12-step treatment orientation reported lower clinician skills and fewer policy-related incentives; no significant differences were found in absence of program obstacles based on 12-step treatment orientation.

Regarding the control variable, program administrators reported that an average of 70.47% of patients smoked (see Table 2). In addition, programs with a primarily 12-step treatment orientation reported a significantly higher mean percentage of patients who smoked than those with a primarily non-12-step treatment orientation.

3.2. Relationships between Adoption Extensiveness of Both Behavioral Treatments for TC and System-Level Support for TC, Climate for Innovation, and 12-Step Treatment Orientation

Hypothesis 1 was partially supported. Absence of program obstacles and policy-related incentives were significantly positively related to adoption extensiveness of both behavioral

treatments for TC (see Table 3, Model 2) and system-level support for TC (see Table 4, Model 2); clinician skills did not significantly predict adoption extensiveness. Hypothesis 2 was not supported. A program's 12-step treatment orientation did not significantly predict adoption extensiveness of either behavioral treatments for TC (see Table 3, Model 3) or system-level support for TC (see Table 4, Model 3). Hypothesis 3 and hypothesis 4 were also not supported; 12-step treatment orientation did not moderate the relationship between climate for innovation and adoption extensiveness of both behavioral treatments for TC (see Table 3, Model 4) or system-level support for TC (see Table 4, Model 4).

4. Discussion

The current study makes several unique contributions to the SUD literature on TC treatment. First, utilizing Klein and Sorra's (1996) adoption of innovation framework, we examined the association between three indicators of climate for innovation (clinician skills, absence of program obstacles, policy-related incentives) and adoption extensiveness of behavioral treatments for TC and adoption extensiveness of system-level support for TC. Second, we investigated the relationship between 12-step treatment orientation and adoption extensiveness. Third, we evaluated whether 12-step treatment orientation moderates the relationship between climate for innovation and adoption extensiveness. Results show that both absence of program obstacles and policy-related incentives are positively associated with adoption extensiveness of both behavioral treatments for TC and system-level support for TC. By contrast, clinician skills are unrelated to both behavioral treatments for TC and system-level support for TC. In addition, 12-step treatment orientation is unrelated to adoption extensiveness and does not moderate the relationship between climate for innovation and adoption extensiveness.

4.1. Adoption Extensiveness of Both Behavioral Treatments for TC and System-Level Support for TC, Climate for Innovation, and 12-Step Treatment Orientation

Before discussing the findings pertaining to our hypotheses, we want to point out the generally low adoption extensiveness of both behavioral treatments for TC and system-level support for TC. This is an interesting although disconcerting finding considering that both EBPs are endorsed by national guidelines for the treatment of tobacco dependence for over a decade (Fiore et al., 2008). These findings are reflective of similarly low adoption patterns of other EBPs in SUD treatment settings (e.g., Knudsen & Studts, 2011; Richter et al., 2004; Roman et al., 2010; Rothrauff & Eby, 2010), highlighting the research-to-practice gap and the initially slow process of diffusion of innovations (Rogers, 2003). The low adoption of these TC EBPs is a further public health concern considering that program administrators in our study indicated that approximately 70% of patients in their program smoke, which is similar to findings by other researchers (for a review of the literature, see Gudyish et al., 2011). Thus, EBPs such as behavioral treatments for TC and system-level support for TC should become basic services made available to all patients who smoke and are interested in quitting.

Specific to the purposes of our study, our findings demonstrate that theoretical frameworks proposed outside of the SUD treatment field, specifically Klein & Sorra's (1996) innovation implementation effectiveness framework, are useful for selecting novel predictors of adoption extensiveness of both behavioral treatments for TC and system-level support for TC. We find that two indices of climate for innovation, greater absence of program obstacles and greater policy-related incentives, are related to more extensive adoption of both behavioral treatments for TC and system-level support for TC. These findings are supported by Klein and Sorra's theoretical framework as well as previous research using individual independent variables on the adoption of pharmacotherapy in SUD treatment programs (e.g., Abraham et al., 2011; Brian et al., 2013; Knudsen et al., 2005; Rieckmann et al., 2011).

Counter to both Klein and Sorra's (1995) theoretical framework and existing research examining specific aspects of clinician skills in relation to the adoption of pharmacotherapy (e.g., Abraham et al., 2011; Knudsen et al., 2005; Rieckmann et al., 2011; Rothrauff & Eby, 2010), we find that SUD clinician skills are not significantly related to the adoption extensiveness of either behavioral treatments for TC or system-level support for TC. Perhaps compared to the adoption of pharmacotherapy, the use of behavioral treatments for TC and system-level support for TC requires more tailored skills such as clinician training in a variety of behavioral treatments specific to TC (e.g., counseling skills and availability of training in TC). This may be because clinicians cannot prescribe pharmacotherapy but they are the frontline people who provide behavioral treatments and are in need of system-level support for TC.

An alternative explanation for the non-significant clinician skills findings may be that absence of program obstacles and policy-related incentives are more important climate for innovation indices than clinician skills. If so, then this may mask significant relationships between clinician skills and adoption extensiveness of behavioral treatments for TC and adoption extensiveness of system-level support for TC. In order to test this speculation we conducted a post-hoc analysis with clinician skills as the only predictor of adoption extensiveness of behavioral treatments for TC and of system-level support for TC. If absence of program obstacles and policy-related incentives mask clinician skills, we would expect significant relationships between clinician skills and the adoption of both behavioral treatments for TX and system-level support for TC. The relationship between clinician skills and behavioral treatments for TC remained non-significant, providing evidence against our alternative explanation. However, the analysis for clinician skills and system-level support for TC showed a significant main effect for clinician skills but non-significant 12-step moderator effect, providing possible support for our speculation.

We also find that 12-step treatment orientation is not related to the adoption extensiveness of either behavioral treatments for TC or system-level support for TC and is not a moderator of the relationship between climate for innovation and adoption extensiveness. The lack of significant findings, although contradictory to our expectations, is supported when examining the relationship between the individual items of the adoption extensiveness measures and 12-step treatment orientation. There were very few differences in the individual items, supporting similar adoption extensiveness based on 12-step treatment orientation. However, these findings run counter to previous research which shows that TC pharmacotherapy (Rothrauff & Eby, 2010) and pharmacotherapy for other addictions (Knudsen et al., 2007; Oser & Roman, 2007, 2008) is less likely to be offered in treatment programs with more of a 12-step treatment orientation.

One explanation for these unexpected findings could be that behavioral treatments for TC and system-level support for TC are more acceptable forms of EBPs than pharmacotherapy, because of the 12-step treatment philosophy that stresses the abstinence from all drugs (White, 1998). This would include pharmacotherapy intended to aid abstinence and recovery from SUDs. For example, Rogers (2003) argues that the adoption of an innovation depends on whether the innovation is compatible with one's beliefs and values. Because behavioral treatments and system-level support not specific to TC are generally already part of clinicians' repertoire with patients, the adoption of similar EBPs specific to TC may be more compatible with existing practices than pharmacotherapy adoption regardless of 12-step treatment orientation. This may explain the non-significant findings in the adoption extensiveness of behavioral treatments for TC and system-level support for TC based on a program's 12-step treatment orientation.

4.2. Limitations, Suggestions for Future Research, and Conclusions

One limitation of our study is the use of program administrator survey data rather than observational data collected by researchers to determine the adoption extensiveness of both behavioral treatments for TC and system-level support for TC. It is possible that respondents over- or under-report the adoption of EBPs. However, when we compare our findings that are based on a large random sample of program administrators and findings from non-random samples investigating the adoption of pharmacotherapy (e.g., Abraham et al., 2011; Bride et al., 2013; Knudsen et al., 2005; Rothrauff & Eby, 2010), we see similarly low adoption extensiveness of EBPs. In addition, we do not have information on non-responding programs to compare program characteristics because no interviews were conducted with them. This places another caveat on generalizability and should be considered in future studies.

Another limitation is the cross-sectional design of the study that only allows us to discuss the findings at one point in time rather than evaluate changes over time. It is possible that the adoption extensiveness of both behavioral treatments for TC and system-level support for TC changes over time. As such, longitudinal data are important to provide a better understanding whether the adoption extensiveness of both behavioral treatments for TC and system-level support for TC increases, decreases, or is sustained over time. In addition, prospective studies should include data from multiple sources such as clinicians, patients, and program administrators to provide a multi-level perspective of the adoption extensiveness and changes in the adoption of EBPs for TC.

Future research on the adoption extensiveness of both behavioral treatments for TC and system-level support for TC in SUD treatment programs, as well as adoption of EBPs more generally, should also pay more attention to using theoretical frameworks for the selection of predictors of adoption extensiveness. A focus on theoretically driven predictors will provide greater methodological strengths and the discussion of findings. Theoretical frameworks can be selected from a variety of disciplines, for example, nursing, organizational psychology, and business, that can be tailored toward the unique issues and needs of the SUD treatment field. This may also include the examination of various organizational profiles that may better explain the (low) adoption extensiveness of EBPs.

In addition, upcoming studies could examine another part of Klein and Sorra's (1995) model—innovation-values fit—which was not examined here due to the purpose of our study and focus on program administrators. Innovation-values-fit refers to the degree to which the use of the innovation is aligned with employees' personal values and beliefs. This will provide a more comprehensive test of the Klein and Sorra (1995) framework by including clinician reports of values and beliefs regarding EBTs for TC.

In conclusion, the current study helps to advance the SUD treatment field in three major areas. We provide support that theoretical frameworks outside of SUD treatment have utility for the selection and development of unique predictors of adoption extensiveness of both behavior treatments for TC and system-level support for TC. We find that two indices of climate for innovation—absence of program obstacles and policy-related incentives—are significantly positively related to the adoption extensiveness of both behavior treatments for TC and system-level support for TC. Additionally, 12-step treatment orientation does not predict adoption extensiveness, which is in contrast to findings regarding the adoption of pharmacotherapy in SUD treatment programs. Finally, 12-step treatment orientation does not moderate the relationship between climate for innovation and adoption extensiveness of behavior treatments for TC and adoption extensiveness of system-level support for TC.

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Table 1

Descriptive Statistics of Individual Items Comprising Tobacco Cessation (TC) Adoption Extensiveness and Climate for Innovation by 12-Step Treatment Orientation

Variable	Total (N = 1006)	Primarily 12-Step (N = 238)	Primarily Non-12-Step (N = 768)	χ^2 or F
Adoption Extensiveness of Behavioral Treatments for TC (f, %) ²				
1. Provide self-help materials	772	77.12	180	75.95
2. Have additional community resource referrals	729	73.12	169	72.22
3. Provide individual counseling that focuses on problem solving	385	38.38	94	39.50
4. Use specific motivational interviewing techniques to enhance motivation for TC	376	37.70	72	30.51
5. Offer individual counseling that focuses on social support	376	37.60	92	38.82
6. Has four or more individual counseling sessions available	323	32.24	71	29.83
7. At admission, implement brief counselor interventions (5As)	304	30.99	66	28.45
8. Offer group counseling	295	29.41	75	31.65
9. Provide combined counseling and medication treatment	226	22.51	56	23.53
10. Provide telephone counseling/quitline support	163	16.22	30	12.61
11. Use contingent reinforcement (specific rewards for not smoking)	149	14.89	35	14.77
Adoption Extensiveness of System-Level Support for TC (f, %) ²				
1. All smokers are identified at intake	802	80.36	182	76.47
2. Clinical staff is discouraged from smoking	709	70.90	171	71.85
3. Provide counselor resources for TC treatments	515	51.40	117	49.16
4. Smoking is permitted at the treatment program (reverse scored)	389	38.67	63	26.47
5. Provide evidence-based treatments as services	376	37.75	82	34.89
6. Provide counselor training on TC treatment	311	31.04	68	28.69
7. Provide clinical supervision on TC treatments	261	26.15	59	24.89
8. Have dedicated staff to provide TC treatments	252	25.10	63	26.47
9. Assess TC treatment in staff performance evaluation	83	8.32	21	8.90
Climate for Innovation: Clinician Skills (M, SD)				
1. % of counseling staff with at least a bachelor's degree	73.62	31.94	61.90	35.21
2. % of total workforce with educational background in medicine, public health, psychology or related field	69.40	30.99	60.44	33.44
3. % of counseling staff currently certified	56.34	37.68	58.70	37.10

Variable	Total (N = 1006)	Primarily 12-Step (N = 238)	Primarily Non-12-Step (N = 768)	χ^2 or F^1
4. % of counseling staff currently licensed	54.16	38.56	39.45	54.99
5. % of counseling staff with at a master's degree or above	48.20	35.76	35.24	51.62
Climate for Innovation: Absence of program obstacles (f, %) ²				
1. Program operates as a non-profit entity	724	72.62	74.79	549
2. Program offers mental health care services	721	71.74	61.76	574
3. Program provides medical services	298	29.83	32.91	220
4. Program offers non-outpatient level of care	208	20.74	32.49	131
5. Program is affiliated with a hospital/other medical facility	175	17.41	19.33	129
6. Program is hospital-based	60	5.97	7.98	41
Climate for Innovation: Policy-related incentives...extent to which service is reimbursable (M, SD)				
1. Other financial resources exist within the treatment program to support TC (e.g., training opportunities for staff on TC treatment)	1.58	.87	.79	1.61
2. Counselor time spent providing individually-based TC	1.39	.82	.67	1.43
3. Counselor time spent providing group-based TC treatment	1.36	.81	.68	1.40
4. Pharmacological interventions for TC	1.35	.81	.83	1.35

Note.

¹ Significant primarily 12-step versus primarily non-12-step treatment orientation difference.

² Indicates the number of yes responses.

p < .001

*
p < .05

Table 2
Descriptive Statistics of Tobacco Cessation (TC) Adoption Extensiveness and Climate for Innovation by 12-Step Treatment Orientation

	Total (N = 1006)			Primarily 12-Step (N = 238)			Primarily Non-12-Step (N = 768)		
	M	SD	Min-Max	M	SD		M	SD	F ^I
Dependent Variables: Adoption Extensiveness									
Behavioral Treatment for TC	4.08	3.08	0–11	3.95	2.96		4.12	3.11	.54
System-Level Support for TC	3.68	2.35	0–9	3.47	2.39		3.74	2.33	2.38
Independent Variables: Climate for Innovation									
Clinician Skills	60.39	20.78	0–100	53.94	21.89		62.38	20.03	30.62 ^{***}
Absence of Program Obstacles	2.17	1.26	0–6	2.28	1.30		2.14	1.25	2.12
Policy-Related Incentives	1.44	.65	1–4	1.35	.55		1.46	.68	5.54 [*]
Control Variable: % of Patients Smoking	70.47	20.93	0–100	73.06	19.97		69.65	21.16	4.80 [*]

Note.

^I Significant primarily 12-step versus primarily non-12-step treatment orientation difference.

 $p < .001$

*
 $p < .05$

Table 3
Hierarchical Multiple Regression Models: Adoption Extensiveness of Behavioral Treatments for Tobacco Cessation (TC)

	Model 1		Model 2		Model 3		Model 4	
	β	SE (B)	β	SE (B)	β	SE (B)	β	SE (B)
% of Patients Smoking	.07	.00*	.05	.00	.05	.00	.05	.00
Clinician Skills			-.02	.00	-.02	.00	-.05	.01
Absence of Program Obstacles			.16	.07***	.16	.07***	.14	.08***
Policy-Related Incentives			.45	.14***	.45	.14***	.43	.15***
Primarily 12-Step Tx Orientation					-.01	.20	-.00	.21
Primarily 12-Step Tx Orientation X Clinician Skills							.04	.01
Primarily 12-Step Tx Orientation X Absence of Obstacles							.02	.16
Primarily 12-Step Tx Orientation X Policy-Related Incentives							.04	.36
<i>F</i>	4.91*		80.31***		64.22***		40.77***	
<i>R</i> ²	.01		.25		.25		.26	
<i>N</i>	989		945		945		945	

* $p < .05$

** $p < .01$

*** $p < .001$

Table 4
Hierarchical Multiple Regression Models: Adoption Extensiveness of System-Level Support for Tobacco Cessation (TC)

	Model 1		Model 2		Model 3		Model 4	
	β	SE (B)	β	SE (B)	β	SE (B)	β	SE (B)
% of Patients Smoking	.01	.00	.00	.00	.00	.00	.00	.00
Clinician Skills			.04	.00	.04	.00	.01	.00
Absence of Program Obstacles			.15	.05***	.15	.05***	.14	.06***
Policy-Related Incentives			.46	.10***	.46	.10**	.46	.12***
Primarily 12-Step Tx Orientation					-.01	.16	-.00	.16
Primarily 12-Step Tx Orientation X Clinician Skills							.06	.01
Primarily 12-Step Tx Orientation X Absence of Obstacles							.03	.12
Primarily 12-Step Tx Orientation X Policy-Related Incentives							.01	.27
<i>F</i>	.16		84.71***		67.75***		42.94***	
<i>R</i> ²	.00		.26		.26		.27	
<i>N</i>	990		946		946		946	

* $p < .05$

** $p < .01$

*** $p < .001$