

ORIGINAL ARTICLE

Transdisciplinary collaboration and endorsement of pharmacological and psychosocial evidence-based practices by medical and psychosocial substance abuse treatment providers in the United States

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Aims: To examine the relative contribution of providers' professional affiliation (medical vs. non-medical), involvement in research, and training needs for associations with endorsement of the following evidence-based practices (EBPs):

- (1) pharmacological – buprenorphine treatment and
- (2) psychosocial – Cognitive Behavioural Therapy (CBT).

Methods: Secondary analysis from a 2008 survey of a national sample ($n = 571$) of substance abuse treatment providers (medical, social workers, psychologists and counsellors) affiliated with the United States National Institute on Drug Abuse's National Drug Abuse Treatment Clinical Trials Network. Multivariate linear regression models to analyze cross-sectional survey data.

Findings: Results demonstrated that medical providers and providers with previous research involvement more strongly endorsed the effectiveness of buprenorphine over CBT. Compared to medical providers, psychosocial providers more strongly endorsed CBT. There was a positive association between needing training in rapport with patients and endorsement of buprenorphine and a negative association with CBT. There was a positive association between needing training in behavioural management and needs assessment and endorsement of CBT.

Conclusions: Results underscore the importance of providers' involvement in research and the need for training medical and non-medical providers in practice areas that can purposely enhance their use of pharmacological and psychosocial EBPs.

INTRODUCTION

Transdisciplinary collaboration refers to the work of diverse service providers – physicians, nurses, social workers, psychologists and paraprofessionals – with distinct training and specializations (McCallin, 2001). Transdisciplinary collaboration has been shown to improve both the management and quality of care (Orchard, Curran, & Kabene, 2005; Pinto, Wall, Yu, Penido, & Schmidt, 2012), and is particularly relevant in substance abuse treatment which often requires the concurrent use of psychosocial and pharmacological interventions (Anton et al., 2006; Volkow, Fowler, Wangand, & Swanson, 2004). Regrettably, research is lacking about how substance abuse service providers compare in terms of their endorsement of pharmacotherapy and psychosocial interventions.

Delivering these interventions requires counselling and medical staffs to collaborate by exchanging information and referrals, by prioritizing patient outcomes, and by achieving consensus around treatment planning (Bronstein, 2002; Ridgely, Lambert, Goodman, Chichester, & Ralph, 1998; Samet, Friedman, & Saitz, 2001). Whereas, the medical staff provides medical care, monitors and prescribes medications (Samet et al., 2001; Substance Abuse and Mental Health Services Administration, 2009), social workers and psychologists perform psychosocial assessments, deliver counseling, and provide case management (Hall, Amodeo, Shaffer, & Vander Bilt, 2000; McLellan, Carise, & Kleber, 2003), and paraprofessionals, such as Credentialed Alcoholism and Substance Abuse Counsellors (CASAC), provide counselling and education (Office of Alcoholism and Substance Abuse Services, 2010). Profound differences in providers' perceptions about evidence-based

practices (EBPs), based on their preferences rather than empirical evidence, may hamper consensus among medical and non-medical providers about what practices to offer patients and clients may end up receiving suboptimal care (Gotham, 2004).

Integration of psychosocial and pharmacological EBPs through provider collaboration may optimize treatment. Therefore, it is crucial to advance knowledge about providers' training needs and attitudes about available EBPs (Miller, Sorensen, Selzer, & Brigham, 2006; Pagoto et al., 2007). Knowing providers' preferences can shed light on best practices and training that are needed for attaining optimal outcomes for patients (Harwood, Kowalski, & Ameen, 2004). This study aims to examine the extent to which medical providers, social workers, psychologists and counsellors endorse two well-established practices – buprenorphine treatment for opioid dependence detoxification and Cognitive Behavioural Therapy (CBT) for maintenance of sobriety and prevention of relapse. This study is innovative because it uses a nationally representative sample of professionals and paraprofessionals in the United States (US). By examining the relative significance of provider-level attributes vis-à-vis their endorsement of a psychosocial and medical intervention, this study offers recommendations for helping providers optimize transdisciplinary collaboration.

EVIDENCE-BASED SUBSTANCE ABUSE TREATMENT PRACTICES

In order to foster continuity of care, coordinate services and expand providers' use of scientific evidence, it is imperative that we understand differences related to providers in different disciplines may endorse and use pharmacological and psychosocial substance abuse treatment practices. Because this study relies on secondary data analysis, we elected to compare attitudes toward buprenorphine and CBT, the two outcomes that were available in the rich data (described below) set we used. Furthermore, these represent two distinct modalities (i.e. pharmacological and psychosocial) of evidence-based interventions.

FACTORS INFLUENCING PROVIDERS' ENDORSEMENT OF EBPs

The literature suggests that agency- and provider-level factors influence providers' endorsement of EBPs, also referred to as 'innovations'. Diffusion of Innovations theory (Rogers, 2003) suggests that endorsement and consequent use of EBPs is influenced by agency-level factors, agency size, training capacity and culture (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005; Gandelman, DeSantis, & Rietmeijer, 2006; Rogers, 2003). Individual behavior theories – e.g. Theory of Planned Behavior (Ajzen, 1991; Ajzen & Fishbein, 1980)

and Social Cognitive Theory (Bandura, 1977) – also define key factors that can influence endorsement, such as providers' attitudes, self-efficacy, and subjective norms (Perkins et al., 2007). These variables are explored below.

Agency-level factors

Agency-level factors contribute to providers' use of and perceptions about EBPs. Training can promote acceptance and adoption of EBPs (Rapp et al., 2007), while a lack of training presents barriers to providers' use of EBP (Hall et al., 2000). Providers are routinely trained in techniques to help them establish rapport with patients, assess patients' needs and manage patients' behaviors (Kerwin, 2005). Coaching, supervision, practice with feedback and web-based methods can also improve providers' knowledge about, attitudes toward, and use of EBPs, (Beidas & Kendall, 2010; Miller et al., 2006; Weingardt, Villafranca, & Levin, 2006). Providers in agencies supportive to research and professional growth are more likely to use EBPs (Aarons & Sawitzky, 2006; Kajermo et al., 2008; Pagoto et al., 2007). Agency resources, such as access to technology, enhance providers' abilities to access scientific evidence and increase exposure to EBPs (Leasure, Stirlen, & Thompson, 2008).

Provider-level factors

Providers' attitudes toward EBPs are associated with their willingness to use EBPs (Lavoie-Tremblay et al., 2008; Pinto, Yu, Spector, Gorroochurn, & McCarty, 2010). Studies comparing providers with master's and doctoral degrees found no difference in their use of EBPs (Nelson & Steele, 2007). However, licensed addiction counsellors with graduate degrees have fewer negative attitudes (Huag, Shopshire, Tajima, Gruber, & Guydish, 2008) and more positive attitudes toward EBPs compared to non-graduate degree counterparts (McCarty et al., 2007). Providers involved in research are more willing to use EBPs (Chagnon, Pouliot, Malo, Gervais, & Pigeon, 2010; Knudsen, Ducharme, & Roman, 2007; Pinto et al., 2010). Therefore, providers that have had the experience of collaboration with researchers are primed to use research findings in practice, suggesting that the experience of collaboration itself makes a difference in providers' practices (Pinto, 2013).

Grounded in this literature, our primary hypothesis is that provider and agency-level factors are associated with endorsement of buprenorphine, a pharmacological EBP for opioid detoxification, and CBT, a psychosocial EBP for maintenance of sobriety. Training providers in EBP has been shown to improve providers' acceptance of and use of EBPs (Beidas & Kendall, 2010). We hypothesize that providers' training needs are therefore associated with their endorsement of both EBPs. Given the paucity of empirical evidence for best practices in training providers to use EBPs, there is particular interest in how providers'

perceived training needs are associated with diverse EBP endorsement.

METHODS

The data we used for this study (secondary analysis) are from a publically available cross-sectional database from the National Institute on Drug Abuse (NIDA) National Drug Abuse Treatment Clinical Trials Network (CTN) workforce study – ‘Baseline for Investigating Diffusion of Innovation’ (McCarty et al., 2007, 2008). The CTN is comprised of approximately 240 treatment programs located across the US. Established in 1999, CTN research centres partner with local substance abuse treatment centres to conduct clinical trials that test behavioural, pharmacological and integrated behavioural and pharmacological interventions (e.g. buprenorphine, motivational interviewing). The CTN’s aim is to help bridge the gap between research knowledge and community practice by convening academic investigators and treatment providers to cooperatively ‘develop and execute clinical trials that generate and validate treatment interventions that fulfil practical needs of community-based drug abuse treatment programs’ (NIDA, 2008). Data and measures can be accessed at <http://www.nida.nih.gov/CTN/Research.html>. Data are derived from 571 providers affiliated with the CTN. In addition to the workforce survey used in this study, the parent trial also collected organizational surveys ($n=106$) and treatment unit surveys ($n=348$). Local research coordinators negotiated procedures involving the distribution of surveys. Providers were given information sheets describing the study, and they signed a consent form only if local IRBs required. Completed surveys were returned to coordinators in sealed envelopes. Participants received incentives for completing the survey. All procedures were approved by appropriate IRBs.

Population

Many CTN-affiliated providers have been involved in the research process as research clinicians or research assistants and receive periodic training in EBPs. They are uniquely positioned to help illuminate the associations between their involvement in research, training needs *and* their endorsement of EBPs. The CTN workforce dataset includes 3786 participants – administrative and support staff and providers. However, for the present study, administrative and support staffs were excluded. *Only* providers that have direct contact with patients were selected ($n=571$). Providers reported whether or not they had been previously involved in research and all provided direct services to patients at the time the survey took place. Thus, the sample is comprised of providers who could make decisions to prescribe buprenorphine and/or offer CBT, as well as recommend that clients access or adhere to these treatments.

Preliminary analysis revealed that some providers, with only an undergraduate degree, have been long-time credentialed counsellors. Alternatively, many providers had graduate level education, licensure and specialized credentials. Therefore, in order to examine the extent to which formal degrees and licensing influenced providers’ endorsement of different practices, providers were categorized by combining their degrees and licensing. ‘Medical staff’ included physicians and psychiatrists, registered nurses and nurse practitioners. ‘Social workers’ had Master’s and/or Doctoral degrees in social work (In the US, clinical social workers comprise a large portion of the workforce providing substance abuse treatment). ‘Psychologists’ were licensed with at least Masters’ degrees in psychology. ‘Counsellors’ included alcohol/drug counsellors, prevention specialists and rehabilitation counsellors with at least undergraduate degrees (these counsellors also comprise a large portion of the workforce providing substance abuse treatment). These categories were used in all analyses with medical staff as the reference group.

Measures

The CTN workforce survey included 139 questions assessing the following domains: demographics; agency- and job-related perceptions and training needs; opinions about substance abuse treatments, research, the CTN and EBPs; and treatment preferences and resources available to staff. Variables for this study were derived from a subset of these questions as described below.

Outcome variables

Participants were asked to gauge their degree of agreement with the following statements about medical and psychosocial practices: ‘Buprenorphine is an effective treatment for opiate dependence’; and ‘CBT is effective with inmates treated in correctional settings’. Both outcomes were measured using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree).

Demographic characteristics

Age was measured in years. Race/ethnicity included the following self-identified categories: White, African American, Hispanic/Latino/a, Native American and Asian/Pacific Islander. Gender was male or female.

Independent variables

Previous involvement in research was measured by a dichotomous variable (Yes/No), ‘Are you personally participating as clinical staff or research assistant?’ At the time of data collection, three clinical trials were being conducted by the CTN: buprenorphine detoxification; motivation enhancement therapy and use of motivational incentives in methadone treatment. Research tasks performed by clinical staff and research assistants included the delivery of interventions within clinical trials, recruitment of participants for research participation and data collection.

Training needs was measured using a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Providers were asked to report their need for training in three areas of practice: 'Assessing patients' problems and needs'; 'Improving rapport with patients' and 'Improving behavioural management of patients'. Three separate items were used because perceived training needs are related to specific practice areas.

Provider attitudes and knowledge about EBPs and perceptions about their agencies were assessed via multiple survey questions. Composite scores were created which included two to six variables. Each variable was measured on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Composites' Cronbach's alphas ranged from 0.60 to 0.70, a reliability deemed reasonably good for correlational analyses (Cohen & Cohen, 1983). These composites reflect factors highlighted in the literature that influence providers' endorsement of EBPs, as follows.

Attitudes about EBPs included five items ($\alpha = 0.60$) assessing attitudes toward scientifically-supported treatments, treatment manuals and EBP guidelines.

Knowledge about empirically-supported practices included four items ($\alpha = 0.70$): following the literature on new techniques and treatment information, reading professional journals and being trained in new skills and techniques.

Agency capacity to adopt research findings included three items ($\alpha = 0.65$): eliciting perceptions about agency encouragement of novel treatment ideas, new and changing technology and new techniques for treatment.

Agency support for professional growth was measured by two items ($\alpha = 0.66$) assessing the extent to which agencies encouraged professional growth and provided opportunities for training.

Data analysis

We accounted for missing data by using a multiple imputation approach (Little & Rubin, 2002) to replace missing values and calculate accurate estimates of standard errors. A set of 20 regression parameters was generated by PROC MI (SAS Institute, 1999b) for the dataset. PROC MIANALYZE in SAS averaged all the values into one stable set of parameters, which are not reportable as they are conducted within the software program, and reduced sample specific effects. The amount of missing data ranged from 2% to 39% across predictor variables. After the imputation, the averaged values reflected the best estimates of a full dataset (for accuracy, the means and standard deviations presented in this paper are non-imputed values). Hypothesis tests are presented using 95% confidence intervals (CIs). All analyses were conducted using SAS 9.1 (SAS Institute, 1999a). The PROC REG procedure was used for multiple linear regression models. ANOVA F tests and multiple pairwise comparisons, using a Tukey

adjustment to control for Type I error at 5%, were used to examine differences in the proportion of different providers' endorsement of buprenorphine and CBT and training needs. To determine the relative contributions of selected predictors, multiple linear regression models were utilized.

Guided by previous studies, we tested the following key hypotheses. Previous research involvement is positively associated with endorsement of both buprenorphine and CBT. Medical providers, compared to their counterparts, more strongly endorse buprenorphine, a pharmacological treatment for opioid dependence, and less strongly CBT, a behavioural intervention for maintenance of sobriety. Providers' perceived needs for training in different practice areas are associated with endorsement of buprenorphine and CBT.

RESULTS

Average endorsement of EBPs and research involvement by demographics

Providers' demographics, endorsement of buprenorphine and CBT, and involvement in research are summarized in Table I. Providers' average age was 51 years ($SD = 11$). Males appear to endorse CBT more strongly ($p < 0.01$). Seventy percent of all providers identified as Caucasian, 16% African American, 7% Latinos, 4% Native Americans and 3% Asian/Pacific Islanders. Of all providers, 172 (30%) were social workers, 143 (25%) medical staff, 132 (23%) psychologists and 124 (22%) counsellors.

The full sample reported low to mid-range endorsement of buprenorphine ($M = 3.18$; $SD = 0.76$) and CBT ($M = 2.32$; $SD = 1.13$). Medical staff had significantly higher endorsement scores for buprenorphine compared to counsellors ($p < 0.001$) and social workers ($p < 0.001$). Psychologists' endorsement of buprenorphine was significantly higher compared to counsellors ($p < 0.001$). The percentage (20–31%) of providers involved in research was similar across categories of providers. The proportion of providers involved in research across the race/ethnicity categories was similar. Although statistically significant ($p < 0.05$), the difference between the proportion of males (17%) and females (26%) involved in research was small. Providers reported needing training in three specific areas, with mean scores from 2.54 ($SD = 1.08$) to 3.32 ($SD = 1.09$). Medical staff ($p < 0.01$), social workers ($p < 0.01$) and psychologists ($p < 0.01$) report significantly greater need for training to improve rapport with patients than counsellors. No significant differences were observed in providers' needs for training to improve behavioural management and assessment of patient problems/needs.

Endorsement of buprenorphine and CBT

The results of the regression models are presented in Table II.

Table I. Demographics, research involvement and endorsement of buprenorphine and CBT^a treatment.

	<i>M (SD)</i>			Research involvement <i>n</i> = 120
	Total sample <i>n</i> = 571	Buprenorphine	CBT	
Age (years) (<i>M, SD</i>)	51 (11)	–	–	51 (11)
Gender (<i>n, %</i>)				
Female	345 (61)	3.26 (0.78)	2.42 (1.13)	60 (51)
Male	221 (39)	3.43 (0.85)	2.63 (1.18)**	57 (49)
Race/ethnicity (<i>n, %</i>)				
White	384 (70)	3.36 (0.85)	2.54 (1.15)	74 (64)
African–American	90 (16)	3.18 (0.73)	2.27 (0.99)	22 (19)
Hispanic/Latinos	39 (7)	3.48 (0.81)	2.67 (1.28)	9 (8)
Native-American	19 (4)	3.31 (0.76)	2.39 (1.13)	6 (5)
Asian/P. Islander	17 (3)	3.29 (0.75)	2.64 (1.38)	5 (4)
Provider type (<i>n, %</i>)				
Medical staff	143 (25)	3.55 (0.90)***	2.42 (1.07)	37 (31)
Social workers	172 (30)	3.21 (0.77)***	2.61 (1.17)	32 (27)
Psychologists	132 (23)	3.34 (0.74)***	2.48 (1.16)	27 (23)
Counsellors	124 (22)	3.16 (0.77)***	2.47 (1.22)	24 (20)

Notes: ^aEndorsement measured on a five-point Likert-type scale (range = 1–5), higher scores indicate stronger endorsement.

p* < 0.01, *p* < 0.001.

Buprenorphine

Compared to their counterparts, providers with previous involvement in research had significantly higher (0.09 units higher) agreement of the effectiveness of buprenorphine (standardized parameter estimate [B] = 0.09, 95% CI = 0.02, 0.34; *p* < 0.05). Compared to medical doctors, social workers had a 0.15 unit lower agreement with buprenorphine’s effectiveness (B = –0.15, 95% CI = –0.42, –0.12; *p* < 0.001); psychologists a 0.10 unit lower agreement (B = –0.10, 95% CI = –0.34, –0.02; *p* < 0.05); and counsellors a 0.15 unit lower agreement (B = –0.15, 95% CI = –0.45, –0.13; *p* < 0.001). Each single unit increase in needing training to improve rapport with patients was associated with a 0.11 unit increase in agreement of buprenorphine’s effectiveness (B = 0.11, 95% CI = 0.02, 0.14; *p* < 0.01). Each single unit increase in providers’ favourable attitudes toward EBPs was associated with a 0.19 unit increase in agreement of buprenorphine (B = 0.19, 95% CI = 0.06, 0.14; *p* < 0.0001).

Cognitive behavioural therapy

Compared to their counterparts, providers previously involved in research were 0.09 units higher in their agreement that CBT is effective (B = 0.09, 95% CI = 0.03, 0.48; *p* < 0.05). Compared to medical staff, social workers had a 0.10 unit higher agreement that CBT is effective (B = 0.10, 95% CI = 0.06, 0.48; *p* < 0.05). Each unit increase in providers’ need for training to improve rapport with patients was associated with a 0.20 unit decrease in agreement with

CBT’s effectiveness (B = –0.20, 95% CI = –0.30, –0.12; *p* < 0.001). Each unit increase in needing training in behavioural management was associated with a 0.09 unit increase in support for CBT (B = 0.09, 95% CI = .002, 0.17; *p* < 0.05). Each unit increase in needing training in assessing patient needs was associated with a 0.14 unit increase in agreement with CBT’s effectiveness (B = 0.14, 95% CI = 0.06, 0.24; *p* < 0.01). Each single unit increase in providers’ favourable attitudes toward EBPs was associated with a 0.13 unit increase in agreement with CBT’s effectiveness (B = 0.13, 95% CI = 0.05, 0.16; *p* < 0.001). Each one-year increase in providers’ age was associated with a 0.09 unit increase in agreement with CBT’s effectiveness (B = 0.09, 95% CI = 0.01, 0.02; *p* < 0.05). Compared to whites, African–American providers were 0.09 units lower in their agreement that CBT is effective (B = –0.09, 95% CI = –0.51, –0.05; *p* < 0.05).

DISCUSSION

This sample of demographically diverse providers from distinct disciplines was ideal for advancing knowledge about associations between involvement in research collaboration, training needs and endorsement of pharmacologic and psychosocial substance abuse treatment practices. While participation in the CTN may influence providers’ attitudes about the interventions, the providers in our sample reflect the opinions and knowledge of providers nationwide due to their demographic diversity (e.g. education, race/ethnicity, age)

Table II. Linear regression model: factors associated with endorsement of buprenorphine and CBT treatment ($n = 571$).

	Standardized Parameter Estimate (95% CI)	
	Buprenorphine	CBT
<i>Demographics</i>		
Age (years)	0.06 (0.00, 0.01)	0.09 (0.01, 0.02)*
<i>Race/ethnicity</i>		
White (reference)	–	–
African-American	–0.06 (–0.29, 0.02)	–0.09 (–0.51, –0.05)*
Native-American	0.03 (–0.18, 0.49)	0.02 (–0.35, 0.63)
Latino	–0.01 (–0.29, 0.20)	–0.03 (–0.50, 0.18)
Asian/P. Islander	–0.04 (–0.50, 0.14)	0.01 (–0.40, 0.52)
Gender (ref: female)	0.06 (0, 0.23)	0.06 (–0.02, 0.31)
<i>Provider type</i>		
Medical staff (ref.) ^a	–	–
Social workers	–0.15 (–0.42, 0.12)***	0.10 (0.06, 0.48)*
Psychologists	–0.10 (–0.34, –0.02)*	0.01 (–0.19, 0.25)
Counsellors	–0.15 (–0.45, –0.13)***	0.01 (–0.19, 0.27)
Research involved	0.09 (0.02, 0.34)*	0.09 (0.03, 0.48)*
<i>Training needs</i>		
Patient rapport	0.11 (0.02, 0.14)**	–0.20 (–0.30, –0.12)***
Patient management	–0.02 (–0.07, 0.04)	0.09 (0.02, 0.17)*
Patient needs	–0.02 (–0.07, 0.05)	0.14 (0.06, 0.24)**
<i>Attitudes</i>		
EBP	0.18 (0.06, 0.14)***	0.13 (0.05, 0.16)***
Knowledge	0.07 (0, 0.05)	0.03 (–0.02, 0.05)
<i>Agency</i>		
Tech. capacity	–0.02 (–0.04, 0.02)	0.02 (–0.03, 0.06)
Support growth	–0.04 (–0.04, 0.01)	–0.01 (–0.04, 0.03)

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

^aMedical staff is the reference group, and other groups are significantly lower in their endorsement as represented by the negative slope coefficient (counsellors having the lowest endorsement of all groups when compared with medical providers).

and their common experience of providing services in community treatment programs. Our analysis identified promising areas of training that, if offered to providers, may enhance their capacity to provide EBPs to patients.

Lower endorsement scores by all professional categories for CBT compared to buprenorphine may reflect the fact that this sample of providers were already involved in the CTN, some of whom were participating in CTN-led buprenorphine clinical trials (Ling et al., 2010). Prior research examining CTN versus non-CTN treatment programs found that CTN affiliation was significantly associated with buprenorphine adoption (Ducharme & Roman, 2009). Thus, this sample may not reflect the attitudes of non-CTN-affiliated providers. Nevertheless, findings suggest that providers, including physicians, can more readily endorse pharmacological opioid detoxification versus psychosocial maintenance of sobriety treatment. Whereas, buprenorphine can be prescribed by a physician, CBT requires providers to receive specific training and ongoing supervision, thus making CBT

adoption more complex and burdensome. This finding also indicates that diverse providers can similarly endorse buprenorphine, and thus underscores the promise of transdisciplinary collaboration.

Compared to medical staff, social workers, psychologists and counsellors had significantly lower endorsement of buprenorphine. Psychosocial providers may not be as knowledgeable about buprenorphine. Providers that adhere to a 12-step orientation, and who may not view pharmacological therapies favourably, have more positive views of psychosocial practices (Knudsen, Ducharme, Roman, & Link, 2005). This presents a challenge for the field of substance abuse treatment because psychosocial providers, are positioned to identify appropriate candidates for buprenorphine, make referrals and help patients adhere to buprenorphine. If counselors are unwilling or unable to fulfill this crucial role, patients will be denied an effective treatment (Marlowe, 2003).

Social workers, compared to medical staff, more strongly agreed with the effectiveness of CBT. This divergence may hinder transdisciplinary collaboration

when medical staff is less informed of behavioural interventions, and may thus rely on medication and neglect to refer patients for other services like CBT (Friedmann, McCullough, Chin, & Saitz, 2000; Miller et al., 2006). This may be particularly relevant in primary care settings where clients will have even less access to counsellors. In order to provide optimal substance abuse treatment, providers will need to reconcile personal views with science-based findings (Ling et al., 2010) supporting the combined use of medical and psychosocial interventions.

Prior involvement in research was significantly associated with endorsement of CBT and buprenorphine. Involvement in research may engender in providers an appreciation for science-based information. This finding corroborates previous studies showing that providers' involvement in research is associated with willingness to use research findings in practice (Chagnon et al., 2010; Pinto et al., 2010). Therefore, emphasis ought to be placed on conducting research collaboratively with providers involved in as many areas of the research process as is feasible.

Providers that endorsed buprenorphine were more likely to need training to improve rapport with patients. Medical staff, the only group licensed to provide medical treatments, reported the highest need for this type of training. Endorsement of CBT was inversely related to needing training in behavioural management and assessment. Social workers and counsellors, who reported the lowest need for this type of training, are expected to establish and maintain rapport with patients over frequent and often long-term contacts. Knowing that various types of providers indicate different training needs and that providers' training needs are associated with endorsement of EBP may ultimately suggest targets for future research to develop trainings in EBP across disciplines that incorporate the unique needs of each discipline. Training should be offered to groups of diverse providers in order to encourage transdisciplinary collaboration.

Favourable attitudes toward EBPs were positively associated with providers' endorsement of CBT and buprenorphine. This finding goes beyond previous studies (Fuller et al., 2007) by showing that providers exhibiting favourable attitudes toward EBP also endorsed pharmacological and psychosocial practices. Grounded in this knowledge, future research ought to focus on examining how providers weigh the relative value of different EBPs. Moreover, in transdisciplinary collaboration training, providers with positive attitudes toward EBPs may influence providers less inclined to use EBPs (Rogers, 2003).

Age and race were significantly associated with providers' endorsement of CBT. Older providers reported higher endorsement of CBT; this may reflect more training in CBT by virtue of having been in the field for a longer period of time. Often, older, more experienced providers are selected to attend trainings based upon seniority and the expectation that they will

then contribute to the training of less experienced peers. While race was significantly associated with endorsement of CBT, the relatively small number of African-American providers in our sample is not sufficient to warrant a race-based explanation. The literature also suggests that provider type, defined by education and job title, do not have a substantial influence on providers' use of EBPs (Huang et al., 2008; McCarty et al., 2007; Nelson & Steele, 2007, 2008; Pinto et al., 2010). However, in this study, provider type was significantly associated with endorsement of buprenorphine and CBT. This suggests that education and professional affiliation may result in distinct approaches to substance abuse treatment and necessitates further research on the impact of education and professional affiliation.

Implications for policy and practice

The workforce of providers in this national sample is interested in obtaining additional training and has insight into their own training needs. For example, training about medication for opiate dependence ought to be emphasized not only for prescribing providers, but also for providers of psychosocial services. Similarly, medical staff should acquire basic knowledge about psychosocial practices like CBT. Training ought to focus on helping providers bridge gaps related to knowledge, attitudes and practices, between medical and non-medical disciplines in order to facilitate transdisciplinary collaboration. Policy makers and funders ought to consider the importance of involving providers in research when evaluating the significance, innovation and methodological merit of proposed research.

Cross-cultural research focused on how to help diverse providers achieve consensus on best practices is recommended and may have a significant impact on the quality of care received by patients worldwide. In countries where 12-step programs are free of charge and EBPs may be less available, providers may rely on other interventions such as spiritual and indigenous healing. In countries where interventions are less available or accessible, there may be more pronounced divergence among medical and non-medical providers. Future research should explore the influence of availability of medical and psychosocial interventions on providers' actual use of and attitudes toward different EBPs.

LIMITATIONS

Limitations of this study include both the cross-sectional design and the measures used. Longitudinal data from providers will be necessary to predict levels of concordance in providers' endorsements and actual implementation of EBPs. Since the survey did not assess transdisciplinary collaboration, we have been unable to assess if differences in attitudes towards specific EBPs have an impact on collaboration, nor can

we assess associations between transdisciplinary collaboration and attitudes toward EBPs. Future research using longitudinal designs, including assessments of transdisciplinary collaboration, may reveal patterns of collaboration, and demonstrate how attitudes toward pharmacological and psychosocial EBP influence treatment recommendations and practices. Future research focused on examining associations between providers' attitudes, treatment practices and patient outcomes ought to be encouraged by policy makers. The measure used to assess providers' involvement in research did not assess the extent of involvement. Lacking specificity, this question must be replaced in future studies by detailed measures about providers' specific types of involvement in research. The question about Buprenorphine is generic whereas the question about CBT is population-specific and may assess different knowledge. However, these questions were the most relevant in the rich data set. We contend that the disciplinary and demographic diversity among respondents render a distribution of responses that reflects a broad array of knowledge grounded in professional experiences, thus mitigating the impact of idiosyncratic interpretations.

To preserve the anonymity of CTN-affiliated sites, the publicly available data set does not contain site-specific identifying variables, making it impossible to connect the multi-level surveys collected in the parent study. Future research using qualitative methods may be helpful for uncovering other variables involved in the complex associations between training needs and endorsement of diverse EBPs.

CONCLUSION

The current findings revealed that providers' specializations are critical to their perceptions about these practices. Medical staff differed from psychosocial providers by their greater endorsement of pharmacological interventions. Therefore, provider training should explicitly address issues of evidence regardless of providers' education, job title and knowledge level. Greater emphasis ought to be placed on training all providers how to practice in transdisciplinary teams so that knowledge about pharmacological and psychosocial practices is elevated among all professionals.

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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