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Substance abuse treatment providers' involvement in research is associated with willingness to use findings in practice

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Abstract

Using a national sample (n = 571) of substance abuse treatment providers affiliated with the Clinical Trials Network, we examined the contribution of several factors – demographic, attitudes and involvement in research – toward providers' willingness to use research findings in practice. The sample included medical staff, social workers, psychologists and counselors. Using a multiple linear regression model, we examined the impact of involvement in research and willingness to use research findings in practice. Providers involved in research were more willing to use findings in practice ($p<.001$). Latino/as were less willing ($p<.05$). Providers with favorable attitudes toward evidence-based practices and whose agencies supported professional growth were more willing to use findings ($p<.01$). Involvement in research may enhance providers' willingness to use findings in practice and improve quality of services. Results underscore the need for providing opportunities for *all* providers to engage in substance abuse treatment research, particularly racial/ethnic minority providers.

Keywords

CBPR; Research to practice; Provider use of research; Provider involvement in research

1. Introduction

A burgeoning literature points to a 15–20 year gap between available substance abuse evidence-based practices (EBPs) (Institute of Medicine, 2000) and their use by service

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providers – addiction counselors (Thomas & Miller, 2007), psychologists (Boisvert & Faust, 2006), psychiatrists (Perlis, 2007) and nurses (Pravikoff, Tanner, & Pierce, 2005). Though still lacking, research to uncover the factors that influence providers' use of research in practice has grown in the past several years. One recent study has shown an association between providers' affiliation with NIDA-funded Clinical Trials Network and their acceptance of buprenorphine as a treatment for opiate addiction (Knudsen, Ducharme, & Roman, 2007b). Providers in work environments they identified as unsupportive toward research perceived the use of research findings as a barrier to practice (Kajermo et al., 2008) (Pagoto et al., 2007). Those perceiving their work environment as open to research (Lavoie-Tremblay et al., 2008) and supportive toward their professional growth (Aarons & Sawitzky, 2006) have used EBPs more frequently than providers with negative attitudes. Though it is a requisite for gaining access to research findings, information technology is lacking in most community settings. Such lack has been shown to make providers less likely to use EBPs (Leasure, Stirlen, & Thompson, 2008).

A moderate association was found between gender and age *and* positive attitudes toward EBPs among marriage counselors, social workers, psychologists and psychiatrists (Aarons & Sawitzky, 2006). Whereas females and older providers have been more willing to use research findings, providers' race/ethnicity has not been shown to relate significantly to their willingness to use research in practice. While research-related knowledge is not sufficient to compel providers to use research findings (Hardisty & Haaga, 2008), knowledge attained through, for example professional journals, has been shown to be associated with positive attitudes toward treatment guidelines for substance use disorders (Willenbring et al., 2004). Two studies comparing providers with master's and doctoral degrees found no difference in their use of EBPs (Nelson & Steele, 2007, 2008). Nonetheless, licensed addiction counselors with graduate degrees were shown to have fewer negative attitudes toward EBPs (Huag, Shopshire, Tajima, Gruber, & Guydish, 2008) and more positive attitudes toward them (McCarty et al., 2007).

Though several factors have been identified, this literature is still inconclusive about the extent to which providers use research findings to guide their practices. Previous studies have used different terms (e.g., manualized intervention, treatment guidelines, evidence-based practice, and empirically-supported intervention) to measure providers' use of research in practice. Nonetheless, providers may find it easier to use, for example, selected parts of an intervention, empirically-supported ways to engage clients, case studies, or practice recommendations found in studies employing different methodologies. The current study uses the term "research findings" to measure providers' use of research, because it includes all possible empirical knowledge providers may use to guide practice.

Furthermore, providers, including medical professionals, social workers and psychologists often perceive EBPs as top-down impositions. The literature suggests that well-intentioned providers thus rely on practice wisdom and often neglect to use empirically-supported treatments (Pignotti & Thyer, 2009). This failure to deliver the most up-to-date effective treatments hampers researchers' and providers' abilities to address substance abuse and its associated problems of homelessness, poverty, unemployment and others (Copeland et al., 2009; Daley & Moss, 2002). To strengthen providers' use of research findings in practice, Community-Based Participatory Research (CBPR) has encouraged collaboration between researchers and providers in all phases of research (Pinto, 2009; Pinto, McKay, & Escobar-Chavez, 2008). Providers' involvement in research may help generate interventions more congruent with how they provide services and thus inspire them to use research findings to help their clients. However, to our knowledge, no previous research has demonstrated that providers' personal involvement in research is associated with their willingness to use research findings in practice.

Guided by the CBPR literature, we hypothesized that both personal and work-related factors could be significantly associated with providers' willingness to use research findings in practice. We were particularly interested in the relative contribution of providers' personal involvement in research and the extent to which their degrees and licensures would influence their use of research findings in practice. We thus used data from providers affiliated with the Clinical Trials Network (CTN), a research platform funded by the National Institute on Drug Abuse (NIDA). Our sample included 571 providers with various degrees and licensures, many of whom had been involved in research as research assistants and/or clinical staff.

Clinical Trials Network (CTN)

The CTN is comprised of approximately 150 Community Treatment Programs countrywide. NIDA established the CTN to bridge science and practice by bringing together researchers and providers (substance abuse counselors, social workers, psychologists and medical doctors) to "cooperatively develop, validate, refine, and deliver new treatment options to consumers of drug abuse services within community settings" (NIDA, 2008). Such involvement aims to improve providers' understandings of and attitudes toward research and to ultimately advance the transportability of research findings into providers' practice. Since CTN-affiliated providers are exposed to and are potentially directly involved in research, they represent a unique population and unique opportunity for examining relationships between their involvement in research and their use of research findings.

2. Materials and methods

2.1 Study Population and Recruitment

We used cross-sectional data collected to characterize the CTN workforce. Details regarding this study – Baseline for Investigating Diffusion of Innovation – have been published elsewhere (McCarty et al., 2007; McCarty et al., 2008) (Access data and measures at http://www.nida.nih.gov/CTN/Research.html).

CTN-affiliated community treatment programs (n=106) completed an organizational survey. Program directors (n=348) completed the treatment unit surveys. Local research coordinators negotiated all procedures for distributing the workforce survey to all providers. They were given information sheets describing the study, and they signed a consent form only in cases when local IRBs required that procedure. Completed surveys were returned to coordinators in sealed envelopes. Participants received incentives for completing the survey. All procedures were approved by appropriate IRBs.

The CTN workforce dataset includes 3,786 participants – administrative and support staff and providers. For this study, we excluded administrative and support staff. We included *only* providers (n = 571) who gave data about their involvement in research *and* who identified themselves as actively involved in counseling clients. We used this stringent selection approach in order to generate a sample representing providers who were either involved or not involved in research, and who, because they were directly involved in counseling, could indeed use research findings in practice. There was wide variation in education and licensure in this sample. For example, some providers, who had only high school education, were very experienced substance abuse counselors licensed by their states to counsel individuals who abuse alcohol and/or substances. Alternatively, other providers had both graduate level education and different licensure.

In order to examine the extent to which their degrees and licensing influenced their use of research, we organized providers into four diverse categories each combining both their degrees and licensing. "Medical staff" included providers licensed as nurses, nurse

practitioners, physician assistants, physicians or psychiatrists with master's or doctoral degrees. "Social workers" included licensed providers with Master's and/or doctoral degrees in social work. "Psychologists" included licensed psychologists with Master's and/or doctoral degrees in psychology. Substance abuse counselors included alcohol/drug counselors, prevention specialists and rehabilitation counselors with at least undergraduate degrees. We used these categories in all subsequent analyses with Medical staff as the reference group.

The CTN workforce survey included 139 questions organized into demographic characteristics; agency- and job-related perceptions; opinions about substance abuse treatments, research, the CTN and EBPs; and treatment preferences and resources available to staff. All variables for this study were derived from these questions.

2.2. Current Study's Variables

2.2.1 Demographic Characteristics—Participants' ages were measured in years. Race/ethnicity included five categories, White, African American, Latinos/as, Native Americans and Asian/Pacific Islanders. Gender was categorized as male or female.

2.2.2 Willingness to Use Research Findings—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. To assess providers' willingness to use research findings, we used the following 5-point Likert scale (1 = strongly disagree to 5 = strongly agree) question, "Involvement in the CTN has increased my willingness to use research findings." This measure was helpful in assessing providers' use of all types of empirically-supported information they may have been willing to use to guide their practices.

2.2.3 Involvement in Research—In order to assess providers' personal involvement in research, we used a dichotomous variable (Yes/No), "Are you personally participating as clinical staff or research assistant?" Research tasks performed by clinical staff and research assistants included the implementation of interventions at clinical trials, recruitment of participants and data collection.

2.2.4 Attitudes, Knowledge and Agency-Level Characteristics—CTN-08 survey questions focused on participants' attitudes and knowledge about EBPs and about their agencies. We used these survey questions to create composites that included two to six variables, all measured on a 5-point Likert scale (1 = strongly disagree to 5 =strongly agree), and whose Cronbach's alphas ranged from 0.60 to 0.70. Items in these composites reflect factors highlighted in the literature reviewed above and which may influence providers' use of research in practice.

Attitudes about medical treatment included six variables (alpha=0.60) regarding attitudes about methadone maintenance, naltrexone, buprenorphine, antabuse treatments, psychiatric medications, and general pharmacotherapy for addiction treatment programs.

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

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

Agency capacity to adopt research findings included three items (alpha=0.65) eliciting providers' perceptions about their agencies' 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 CTN-affiliated programs encouraged professional growth and provided opportunities for training and continuing education.

2.3 Analytical Approach

To detect associations between demographic variables (between and within groups) *and* providers' involvement in research and their willingness to use findings, we used t-tests and X^2 tests. To determine the relative contributions of selected predictors toward providers' willingness to use research findings, we used a multiple linear regression model. Guided by previous studies, we hypothesized that those selected predictors could be significantly associated with providers' willingness to use research findings in practice.

Given the history of low involvement of racial and ethnic minorities in health research as participants and as investigators (National Institutes of Health, 2005), we also hypothesized that demographic characteristics would modify the association between involvement in research and willingness to use research findings. For example, we expected that white male providers with more education/credentials would be more involved in research. We thus used two-way interaction terms between involvement and demographic characteristics. However, we found no statistically significant interactions, suggesting that demographics may not modify the effect of involvement in research on willingness to use research findings. With this additional knowledge, we present below a more parsimonious model without interaction terms (Kleinbaum, Kupper, Muller, & Nizam, 1998).

2.3.1 Missing Data—To account for missing data, we used a multiple imputation approach (Little & Rubin, 2002) to replace missing values and to calculate accurate estimates of standard errors. A set of 20 regression parameters was generated by PROC MI (SAS Institute, 1999) for the dataset. PROC MIANALYZE in SAS averaged all the values into one stable set of parameters, and reduced sample specific effects. The amount of missing data ranged from 2 to 39% across all 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.) We present 95% confidence intervals (CIs) for hypothesis tests. All analyses were conducted using SAS 9.1(SAS Institute, 1999). The PROC REG procedure was used for multiple linear regression models.

3. Results

3.1. Sample Characteristics

Providers' characteristics are presented in Table 1.

The average age was 51 years (*SD*=11). Of all providers, 172 (30%) were social workers, 143 (25%) medical staff, 132 (23%) psychologists, and 124 substance abuse counselors (22 %). The percentage (20% to 31%) of providers involved in research was moderate, but similar in all four categories. Seventy percent of all providers were Caucasian, 16% African American, 7% Latinos, 4% Native Americans, 3% Asian/Pacific Islanders. The proportion of providers involved in research within each of the race/ethnicity categories was similar. Although statistically significant ($p<.05$), the difference between the proportion of males (17%) and females (26%) involved in research was small. We found no other significant

demographic difference. The full sample had a moderate degree of willingness to use research findings (Mean=3.38; *SD* =0.81). Females had a slight, but significantly higher degree of willingness ($p<.05$), compared to males. We found no differences in terms of willingness within race/ethnicity or within professional categories.

3.2 Willingness to use research findings

The results of the regression model are presented in Table 2. The global F test (F = 4.00, numerator df = 15, denominator df = 409) for the model was significant (p < 0.0001). The R^2 was 0.128 (adjusted R^2 = 0.096). The model's standard error was 0.760.

Providers involved as clinical staff or research assistants were more willing to use research findings. Compared to providers not involved in research, those involved had on average a 0.14 unit higher willingness to use research findings (standardized parameter estimate [B] = 0.14; 95% confidence interval [CI] =0.13, 0.44; $p<.001$).

Compared to Caucasian providers, controlling for education, Latino/as had on average a 0.07 unit decrease in willingness to use research findings (B =−0.07; CI = −0.49, −0.02; $p<.05$).

Providers with more favorable (higher scores) attitudes toward medical treatments (B = 0.08; CI = 0.01, 0.04; $p<.01$) and EBPs (B = 0.11; CI = 0.02, 0.10; $p<.01$) were more willing to use research findings. Each single unit increase in providers' favorable attitudes toward medical treatment and EBPs was associated with 0.08 and 0.11 unit increases, respectively, in willingness to use research findings.

Providers who perceived their agencies as supportive (higher scores) of their professional growth were more willing to use research findings. Each single unit increase in providers' perception of their agencies as supportive was associated with a 0.13 unit increase in willingness to use research findings (B = 0.13; CI = 0.02, 0.07; $p<.01$).

4. Discussion

Community-Based Participatory Research (CBPR) suggests that providers' involvement in research can help bridge the gap between research and practice (Pinto et al., 2008) and thus would motivate them to use research findings in practice. Using a national sample of CTN-affiliated providers, we found that personal involvement as clinical staff and/or research assistant predicted greater willingness to use research findings. However, the decision to become involved in research may also have been influenced by a pre-existing positive attitude toward research, perhaps even including a pre-existing greater willingness to incorporate research findings into practice. We used the encompassing term "research findings" to capture more realistically providers' willingness to use different types of empirically-supported information to guide their practices.

4.1. Participant Factors

Compared to White providers, Latinos/as in our sample appear slightly less willing to use research findings in practice when controlling for other demographic characteristics. We acknowledge that our sample may not be representative of the entire population of Latinos/as providers in the CTN, and that their work settings may have had an impact on their abilities to use research findings. For example, Latino/a providers may not have been evenly dispersed across sites, and being Latino/a may be a proxy for being in a setting that is less likely to host clinical trials. Further research in this area will help clarify the degree of participation in research of racial/ethnic minority providers.

Reflecting previous studies, providers with more favorable attitudes toward medical treatments and behavioral evidence-based interventions were found to be more willing to use research findings (Huag et al., 2008; Knudsen, Ducharme, & Roman, 2007a). Whereas positive attitudes had an impact on willingness to use research findings, research knowledge did not. It appears that providers' attitudinal characteristics may be more salient than cognitive ones in predicting their willingness to use research findings. Training providers in basic research methods may inspire them to use research in practice. It may be even more impactful to assist providers to develop positive attitudes toward both research itself and toward the usefulness of research findings. This can be achieved by consistently involving providers in all phases of research from the conceptualization of study aims to the disseminating of results.

As in previous studies (Joe, Broome, Simpson, & Rowan-Szal, 2007; Lavoie-Tremblay et al., 2008), providers who perceived their workplace as supportive of their professional growth (i.e., training and continuing education) were more willing to use research findings in practice. The measure used to assess providers' perception of their agencies' support was entirely determined by providers' reports. This measure is more realistic than those used in previous studies that relied on organizational data instead of providers' perceptions of organizational traits. Though previous studies (Aarons & Sawitzky, 2006; Joe et al., 2007) have shown the impact of agency capacity on providers' willingness to use research, our measure of technology capacity did not yield a significant association. Based on our results, we suggest that support for professional development may be more salient than agency capacity in predicting providers' willingness to use research. We recommend that managers in community settings support professional development through supervision, mentoring, and further training and education.

Reflecting previous studies (Nelson & Steele, 2007, 2008), we found no significant difference among the four professional categories of providers in terms of their willingness to use research findings. Assuming that diverse categories of providers were given similar opportunities to become involved in CTN-related research, the following question remains: what specific factors inspired some providers and not others to become involved? We know, for example, that receiving consultation from experts and having control over the research may improve providers' involvement in testing mental health interventions (Sullivan et al., 2005). Future studies ought to demonstrate the degree to which myriad factors contribute differentially to the involvement of diverse groups of providers. Qualitative research will be necessary to uncover specific strategies that may best inspire providers to become more involved in research and ultimately to use research findings consistently.

4.2. Limitations

The limitations of this study include both the cross-sectional design and the measures we used. Random assignment of providers to involvement *versus* non-involvement in research may have yielded more generalizable conclusions about provider's willingness to use research findings. However, in "real world" settings, provider involvement may be the result of a personal decision-making process and/or of an assignment defined by supervisors. Though limited, the cross-sectional design generated results that more closely resemble the realities of community settings. The measure used to assess providers' involvement in research did not assess the extent of involvement. The question only measured involvement as clinical staff and/or as research assistants. The research-related tasks that clinical staff and research assistants perform may vary across research sites and projects, making it difficult to discern how different types of research tasks influenced providers' willingness to use findings in practice. However, it is worth noting that previous studies have been more limited, in that they focused on one *or* another category of professionals while using

different measures of "willingness to use research findings." In our study, we were better able to make comparisons across distinct types of providers.

To preserve the anonymity of CTN sites, the public available data set does not have any site-specific identifying variables. Regardless of this limitation, to our knowledge no other study has found significant differences between ethnic/racial minority providers' and White providers' use of research findings. We hypothesized that an interaction between race/ethnicity and involvement in research would help explain this finding. However, we found no significant interaction between being Latino and being involved in research. Further research will be necessary to validate this finding and to generate strategies to address potential race/ethnic differences in terms of research involvement and willingness to use research findings.

4.3. Implications for Practice

The current study is unique in that it used the *same* measures with four categories of providers unified by the primary function of providing counseling in community settings. Future research will need to tease out both the types of tasks and the extent of providers' involvement in research, which can most meaningfully improve willingness to use findings in practice. Though the measure used to assess providers' willingness was a good proxy to providers' actual use of research findings, it did not show the extent of providers' actual use of research findings. Though willingness *and* actual use of research findings may be highly correlated, future research ought to use both measures to more accurately demonstrate the relationship between involvement in research and providers' actual use of different types of research findings.

Experience in research design and methods may vary widely among diverse types of service providers. Training in research designs and methods are recommended to inspire providers to become more involved in research. The CTN is a unique, federally funded platform. Most community settings in the United States operate on their own, with fewer resources for clinical trials (Boyd, Einbinder, Rautkis, & Portwood, 2007). Providers in these settings may have different attitudes and abilities compared to CTN-affiliated providers, and may therefore be influenced differently in terms of their involvement in research and their willingness to use research findings. Research in this area is needed to further reveal how best to involve *all* providers in research with an eye toward improving their willingness to use empirically-supported practices.

5. Conclusion

Community-Based Participatory Research promotes collaboration between researchers and providers, in order motivate providers to use research findings to guide their practices. Nonetheless, no previous study has shown that providers' personal involvement in research, as assistants or intervention facilitators, is associated with their willingness to use research findings in practice. This study has demonstrated that involvement in research is positively associated with providers' willingness to use research findings. This study is distinguished from previous research in that it used a large national sample of four categories of providers involved in research as assistants or clinical staff. This sample was also unique in that it included only providers who were *actively* engaged in counseling clients, and were thus ideal for advancing understanding of the relationship between involvement in research and willingness to use research findings in practice.

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Table 1

Providers' demographics, involvement in research and willingness to use findings

	Involved in Research (n=120)	Not Involved (n=451)	Total (N=571)	Willingness to Use Findings (Mean, *SD*)
				Total
				3.38 (0.81)
Age (Mean, *SD*)	52 (11)	51 (11)	51 (11)	--
*__Gender__ (%)				
Female	60 (51)	285 (63)	345 (61)	3.39 (0.79)
Male	57 (49)	164 (37)	221 (39)	3.36 (0.85)
Race (%)				
White	74 (64)	310 (72)	384 (70)	3.35 (0.80)
African-American	22 (19)	68 (16)	90 (16)	3.50 (0.81)
Latinos	9 (8)	30 (7)	39 (7)	3.65 (0.75)
Native-American	6 (5)	13 (3)	19 (4)	3.14 (0.82)
Asian/P. Islander	5 (4)	12 (3)	17 (3)	3.64 (0.86)
Provider type (%)				
Medical Staff	37 (31)	106 (24)	143 (25)	3.43 (0.76)
Social Workers	32 (27)	140 (31)	172 (30)	3.35 (0.78)
Psychologists	27 (23)	105 (23)	132 (23)	3.35 (0.90)
Substance Abuse Counselors	24 (20)	100 (22)	124 (22)	3.40 (0.81)

Notes:

* $p < .05$ for both involvement and willingness

Table 2

Linear Regression Model: Providers' willingness to use research findings (n = 571)

	Standardized Parameter Estimate (95% CI)
Personally Involved in Research	0.14 (0.13, 0.44) ***
Age	0.14 (0.00, 0.01)
Race/Ethnicity	
White (reference)	--
African American	0.06 (−0.02, 0.30)
Native American	0.04 (−0.13, 0.56)
Latino	−0.07 (−0.49, −0.02) *
Asian Pacific Islander	0.03 (−0.17, 0.45)
Gender (male/female)	−0.06 (−0.22, 0.01)
Provider	
Medical Staff (reference)	--
Social Workers	−0.03 (−0.20, 0.09)
Psychologists	−0.02 (−0.19, 0.13)
Substance Abuse Counselors	0.02 (−0.12, 0.21)
Attitudes	
Medical Treatment	0.08 (0.01, 0.04) **
Evidence-Based Practice	0.11 (0.02, 0.10) **
Knowledge	0.06 (0.00, 0.05)
Agency	
Technology Capacity	0.03 (−0.03, 0.04)
Support Professional Growth	0.13 (0.02, 0.07) **

Notes: CI = Confidence Interval;

* p <. 05,

** p < .01,

*** p < .001