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ORIGINAL PAPER

Predictors of Practitioner Self-reported Use of Evidence-Based Practices: Practitioner Training, Clinical Setting, and Attitudes Toward Research

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Abstract In light of the recent movement toward evidence-based practice (EBP) in mental health services, practitioner adoption of EBPs in clinical settings has emerged as an important area for study. This paper reports on the results of a national online survey of mental health practitioners in an attempt to identify correlates of self-reported EBP use in practice. The survey consisted of 214 mental health practitioners from 15 states drawn from a diverse set of clinical settings and representing a variety of theoretical orientations. The results indicated that practitioner training (i.e., taking a class in EBPs), the perceived openness of the clinical setting toward EBPs, and the practitioner's attitudes toward treatment research were significant predictors of self-reported EBP use. The relationship between clinical setting and EBP use was partially mediated by attitudes toward treatment research. Negative attitudes toward treatment research partially mediated the relationship between practitioner training and self-reported EBP use. The findings are presented within the context of efforts to increase EBP use in clinical settings and implications for clinical training, treatment research, and EBP dissemination efforts are discussed.

Keywords Evidence-based practice · Practitioner attitudes · Training · Institutional culture · Treatment research · Dissemination

Predictors of Practitioner Self-reported Use of Evidence-Based Practices

In recent years, the mental health services field has moved toward widespread endorsement of evidence-based practices (EBPs) in clinical settings. In 2005, the American Psychological Association (APA, 2005) approved an official policy statement supporting EBP in professional psychology. The APA policy statement closely resembled the Institute of Medicine's (2001) definition of EBP and reflects a growing consensus regarding the importance of evidence-based approaches across various areas of health care.

As we have noted elsewhere (Nelson & Steele, 2006), the APA statement on EBP in professional psychology is part of a larger movement to better integrate clinical research findings into applied mental health services. In 2003, the President's New Freedom Commission on Mental Health released its report on mental health services in the United States and identified the dissemination of EBPs—defined as "a range of treatments and services whose effectiveness is well documented" (p. 68)—into clinical settings as a national priority (New Freedom Commission on Mental Health, 2003). Similarly, the National Institute of Mental Health (NIMH, 1998) has targeted the gap between clinical research and practice with funding initiatives aimed at facilitating the dissemination of evidence-based approaches into applied settings. Furthermore, professional organizations (e.g., APA

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Divisions 12, 53, 54), influential journals (e.g., *Journal of Consulting and Clinical Psychology*, *Journal of Clinical Child and Adolescent Psychology*, *Journal of Pediatric Psychology*), and individual authors (e.g., Ollendick & Davis, 2004) have called for an increase in the use of EBPs, and have facilitated the movement toward greater implementation of these approaches.

Despite the various calls for the use of EBPs in clinical practice, these approaches appear to be underutilized in applied settings (Hoagwood & Olin, 2002; Kazdin, 1997; New Freedom Commission on Mental Health, 2003). Previous attempts to list and promote treatments with empirical support (e.g., Chambless & Hollon, 1998; Chambless & Ollendick, 2001; Chambless et al., 1996) have been controversial among practitioners. Furthermore, recent research suggests that individual practitioners vary considerably in their openness to adopting EBPs (Aarons, 2004), and many efficacious treatments fail to move quickly from research settings into practice. Even treatments with substantial research support can take 15–20 years before they are fully integrated into routine clinical practice (Balas & Boren, 2000, as cited in the New Freedom Commission on Mental Health, 2003). In light of this gap between clinical science and service, research investigating the factors related to the adoption of EBPs has emerged as an important area for study (NIMH, 1998; Schoenwald & Hoagwood, 2001). Of particular interest is ''practice research'' identifying the various influences on practitioner decision-making regarding the adoption of EBPs (see NIMH, 1998, for discussion of practice research). Although some research has investigated the obstacles to implementing EBPs and practitioner attitudes toward EBPs (Aarons, 2004; Nelson, Steele, & Mize, 2006), little research is currently available on the predictors of practitioner EBP use.

Potential Predictors of Practitioner EBP Use

Practitioner EBP use is likely related to numerous factors associated with the practitioner's training and clinical setting. Aarons (2004) found that practitioners' level of education and clinical experience were related to their attitudes toward adopting EBPs in their work. Consistent with the belief that training is an important influence on EBP use in practice, training at the graduate and professional levels has focused on facilitating EBP use. At the graduate level, APA's guidelines require training in evidence-based treatments for accredited graduate programs in professional psychology (APA, 2002); however, training may vary widely between different graduate programs (Woody, Weisz, & McLean, 2005). At the professional level, research focusing on training practitioners already in the field in EBPs is starting to emerge (e.g., Sholomskas et al., 2005). Taken as a whole, the developing literature on EBP training suggests a general belief that training is an important factor in practitioner use of EBPs in applied settings.

In addition to practitioner training factors, some literature suggests that a practitioner's clinical setting may be related to EBP use. Aarons (2004) found that practitioner attitudes toward implementing EBPs differed by clinical setting, with providers working in wraparound programs reporting more positive attitudes than those in outpatient settings. Furthermore, certain types of clinical settings, such as Community Mental Health Centers (CMHCs) may present unique challenges to implementing EBPs (see Smith-Boydston & Nelson, in press). Beyond the potential influence of the type of clinical setting, the unique institutional culture of an individual setting may be related to practitioner EBP use (Nelson et al., 2006). A large literature on the implementation of health care innovations points to the importance of social and organization influences on individual decisions to adopt an innovation (see Greenhalgh, Robert, MacFarlane, Bate, & Kyriakidou, 2004, for review). Similarly, mental health treatments are implemented within a social context, and the culture of the organization in which the clinician works has been identified as an important factor affecting treatment adoption (Glisson & Schoenwald, 2005). For example, the openness of a particular center to EBPs might influence individual practitioner use of EBPs within the center.

A third potential predictor of EBP use is practitioner attitudes. The movement toward EBPs has not been without controversy, and practitioners' attitudes toward EBPs vary widely (Aarons, 2004). In addition to studying attitudes toward EBPs in general, some research has investigated practitioner attitudes toward important aspects of EBPs. For example, Addis and Krasnow (2000) examined practitioner attitudes toward treatment manuals, a defining characteristic of many EBPs, and found a wide range of attitudes toward manuals and limited use in applied practice. Similarly, Nelson, Steele, and Mize (2006) recently investigated community mental health practitioner attitudes toward EBP treatment research in an open focus group format. Practitioners indicated concerns regarding the relevance of some treatment research to their work, particularly highly controlled ''efficacy'' research (see Persons & Silberschatz, 1998 for discussion of relevance of efficacy research). In contrast,

participants in the groups expressed more openness to ''effectiveness'' research that is conducted in clinical settings with clients similar to those who commonly present for treatment. Practitioner attitudes toward treatment research—which can be defined as investigations of the efficacy and effectiveness of specific treatments—may play an important role in their use of EBPs in practice. Practitioners who find most treatment research underlying EBPs to be valuable and relevant to their work might be expected to be more open to using EBPs in practice. Conversely, practitioners who find this research to be less relevant to their work might be expected to reject EBPs because they view the research foundation with suspicion. However, to this point, little research explicitly testing the relationship between attitudes toward treatment research and EBP use is available.

Hypotheses

Several hypotheses related to practitioner self-reported EBP use were developed prior to data collection and are examined in this study. First, we hypothesized that practitioners' training characteristics (e.g., academic degree, years of clinical experience, and whether or not the practitioner has taken a class in evidence-based treatments) would be significant predictors of their self-reported EBP use. Consistent with the assumptions that underlie efforts to train mental health practitioners in EBPs, we expected that differences in training would result in differences in EBP use in practice. Second, we hypothesized that characteristics of practitioners' clinical settings (e.g., type of clinical setting, openness of the setting to EBPs) would be significant predictors of their self-reported EBP use. This hypothesis was based on the emerging literature highlighting the relationship between clinical setting and practitioner openness to implementing EBPs (e.g., Aarons, 2004; Nelson et al., 2006). Third, we hypothesized that practitioner attitudes toward treatment research would be a significant predictor of practitioner self-reported use of EBPs. Specifically, we expected that practitioners who view such research as relevant to their work would be more likely to use EBPs in their practice than those who view such research more negatively.

In addition to examining these factors as potential predictors of EBP use, we hypothesized two mediator models. First, we hypothesized that the relationship between practitioner training characteristics and EBP use would be mediated by attitudes toward treatment research. We expected that practitioners who received training in EBPs (for example, in an EBP class) would have more positive views of the research that underlies EBPs which would, in turn, increase their likelihood of using EBPs in practice. Second, we hypothesized that the relationship between clinical setting characteristics and EBP use would also be mediated by attitudes toward treatment research. We expected that practitioners who are in clinical settings that are more open to using EBPs would have more positive attitudes toward treatment research and, in turn, would be more likely to use EBPs. After evaluating our hypotheses, we will use the results to develop a model of the predictors of EBP use and make recommendations for clinical training, research, and treatment dissemination strategies.

Method

Participants

The participants were 214 mental health practitioners from 15 different states who completed a brief online survey. Although previous research has focused mostly on Ph.D.-level psychologists, we conceptualized ''mental health practitioner'' more broadly to include master's- and doctoral-level clinicians who spend at least 25% of their professional time in delivering treatment services. The final sample consisted of 115 Ph.D. psychologists, 25 Psy.D. psychologists, 25 Master's-level psychologists, 36 Master's-level clinical social workers and 13 Master's-level clinicians who selected ''other'' for their academic degree. The sample was diverse in terms of clinical setting (26.9% in private practice, 23.1% hospitals, 19.4% CMHCs, 10.6% schools, 7.9% university clinic, and 12.1% in other clinical settings), theoretical orientation (59.3% Cognitive or Cognitive-Behavioral, 10.2% Psychodynamic, 9.7% Behavioral, 7.9% Family Systems, 3.7% Humanistic, 9.2% other), and years of clinical experience (mean = 10.6, SD = 9.4).

Procedures

Mental health practitioners were identified and recruited to complete a brief online survey using two primary recruitment strategies which were approved by the Human Subjects Committee at the University of Kansas. First, presidents of state psychological associations were contacted via email regarding recruitment of members to participate in the survey. Thirty presidents were contacted and ten presidents (33.3%), representing a diverse geographic sample, agreed to recruit members by forwarding a recruiting

email to members signed up for their association listserv. Of the 20 presidents who were contacted and did not agree to participate, five (25%) declined to participate and 15 (75%) did not respond to our email. The recruiting email, which was forwarded to members of participating associations, gave a brief and general description of the study indicating that the survey would include questions on ''preferences regarding treatments and treatment research.'' Potential participants were also informed in the email that a participating publisher would provide a 20% one-time discount coupon for those completing the survey. A link directly to the survey website was included in the email to provide potential participants easy access and increase participation. Using this method, a total of 1,062 potential participants were contacted; however, it should be noted that, because state psychological association memberships comprise both clinicians and researchers, not all of these potential participants were eligible for inclusion in the study (i.e., they do not spend at least 25% of their professional time in clinical practice).

Second, in the interest of recruiting clinicians from a wider range of academic backgrounds and clinical settings, a national sampling of community mental health centers (CMHCs) and hospitals providing mental health treatment services was contacted. Potential participating institutions were identified from a list available at the Substance Abuse and Mental Health Services Administration (SAMHSA, 2005) website (www.mentalhealth.samhsa.gov/databases) and were drawn from 16 states. The directors of 32 institutions were contacted via email and a recruiting procedure similar to the one used for state psychological associations was employed. Of the 32 institutions contacted, the directors of 15 institutions (46.9%; 8 CMHCs, 7 hospitals), representing 10 states, agreed to recruit clinicians at their site to participate. Participating directors were given a general description of the project and asked to forward the recruiting email to eligible clinicians in their institution. Potential participants were then able to click on a link that took them directly to the survey. Using this method of recruitment, 198 potential participants were contacted.

Potential participants who arrived at the survey website, regardless of how they were initially identified and recruited, were given a brief description of the survey and the opportunity to give their informed consent to participant or withdraw without penalty. At no point during the recruitment process were potential participants told that the study focused on EBPs or any related term. Participants who gave their informed consent were asked a ''gatekeeper question'' (*Do you spend at least 25% of your professional time providing treatment or treatment-related activities, i.e., direct client contact, case management, preparation, supervision, and other treatment-related activities?*). Respondents who indicated ''yes'' were directed to the survey for this study, while those who responded ''no'' were directed to a survey for another study.

Overall, 1,260 potential participants identified through the two methods of recruitment were contacted to participate in this study. Of the 1,260 potential participants, 276 met the criteria for inclusion in the study (i.e., master's- or doctoral-level clinician spending at least 25% of professional time in clinical practice) and gave their informed consent to participate in the study (21.9%). Unfortunately, 62 participants did not complete a significant portion of the survey due to technical difficulties or terminating the survey page before completing the survey. Correspondence from potential participants indicated that technical difficulties were the most common reason for not completing the survey, and the causes of technical difficulties were usually unknown and did not appear to systematically exclude potential participants. The actual participation rate for eligible clinicians could not be directly calculated because the number of state psychological association members who were eligible is unknown; however the participation rate is likely considerably higher than 21.9% as only a percentage of those contacted were actually eligible for the study. In accordance with the institutional review board (IRB) approval of this project, participant anonymity was maintained throughout the project.

Practitioner Survey

Data for this study were collected via the online practitioner survey. The survey consisted of 97 items assessing the practitioner's professional characteristics, attitudes toward treatment research and EBP use. Most participants completed the survey in 15–20 minutes. A subset of the survey was specifically designed for use in this study and the remaining items were designed for use in other studies. Practitioner EBP use was measured by self-reported response to the question, ''*How often do you use 'evidence-based practices' in your clinical work?*'' (*1 = Never/Almost Never*, *2 = Sometimes*, *3 = Often*, *4 = Always/Almost Always*). Responses ranged from 1 to 4 with a mean of 2.62 and a standard deviation of .86.

To assess characteristics of the practitioner's training, respondents were asked to indicate the highest academic degree they have earned (e.g., Ph.D., Psy.D., MA, MS, MSW), their theoretical orientation (e.g.,

Psychodynamic, Behavioral, Cognitive or Cognitive-Behavior, Family Systems, Humanistic), and whether or not they have taken a class in evidence-based treatments (i.e., *Have you ever taken a class in ''evidence-based treatments,'' ''empirically supported treatments, ''empirically-validated treatments,'' or any comparable version of these?*). Approximately 49% of respondents answered ''yes'' to this question. Practitioner clinical setting was measured by asking participants to indicate the type of clinical setting in which they work (see Table 1 for sample characteristics). Participants were then asked to rate the openness of their primary clinical setting to EBPs on a 5-point scale. Specifically, they were asked to, *''Please rate you primary clinical setting on its openness to using evidence-based practices in treatment'' (1 = Not at all open, 5 = Extremely open)*. Responses ranged from 1 to 5, with a mean of 4.44 and a standard deviation of .84.

In order to assess practitioner attitudes toward treatment research, two brief scales were constructed and included in the survey. The *positive attitudes toward treatment research* scale is a 4-item measure created to assess the degree to which a practitioner holds positive attitudes toward treatment research (see Table 2 for items, means, and standard deviations). The *positive attitudes* scale showed adequate internal consistency in this sample ($\alpha = .76$). The *negative attitudes toward treatment research* scale is a 4-item measure created to assess the degree to which a practitioner holds negative attitudes toward treatment research (see Table 2 for items, means, and standard deviations). The *negative attitudes* scale showed adequate internal consistency in this sample ($\alpha = .74$). The *positive* and *negative attitudes* scales were moderately negatively correlated with each other ($r = -.458$, $p < .001$), suggesting that these constructs are related but not redundant. That is, positive attitudes toward treatment research is not merely the absence of negative views toward treatment research and vice versa. Given the potential differences between these two constructs, both scales are used separately in the analyses to measure different dimensions of practitioner attitudes toward treatment research.

Table 1 Sample breakdown by academic degree, theoretical orientation, and clinical setting

	Percent
Academic degree	
Ph.D.	53.7
Psy.D.	11.7
M.A./M.S.	11.7
M.S.W.	16.8
Other Master's Degree	6.1
Theoretical orientation	
Cognitive/cognitive-behavioral	59.3
Psychodynamic	10.2
Behavioral	9.7
Family systems	7.9
Humanistic	3.7
Other	9.2
Clinical setting	
Private practice	26.9
Hospital	23.1
Community mental health center	19.4
School	10.6
University clinic	7.9
Other clinical settings	12.1

Results

Preliminary Analyses

In order to explore potential differences in self-reported use of EBPs based on demographic variables (i.e., academic degree, theoretical orientation, clinical setting, and years of clinical experience), a series of ANOVAs, t tests, and correlational analyses were conducted. For academic degree, no significant between group differences were found, $F(5, 208) = 1.06$, $p > .05$. To explore potential differences based on the level of education, doctoral and master's level practitioners were compared on self-reported EBP use, and no significant differences were found, $t(212) = 1.25$, $p > .05$. For theoretical orientation, significant between group differences were observed, $F(5, 208) = 6.79$, $p < .001$, with practitioners identifying as behavioral or cognitive-behavioral reporting higher levels of EBP use. For clinical setting, significant between group differences were found, $F(5, 208) = 4.49$, $p = .001$, with practitioners from hospitals or university clinics reporting higher levels of EBP use. For years of clinical experience, no significant relationship between a practitioner's years of clinical experience and self-reported EBP use was observed, $r = -.088$, $p > .05$. The results of the between-group preliminary analyses should be interpreted with caution, however, because group sizes varied considerably (see Table 1 for sample demographics). However, these analyses suggest that practitioner theoretical orientation and clinical setting might be important predictors of self-reported EBP use and should be included in subsequent models predicting EBP use. Conversely, practitioner academic degree and years of clinical experience were not significantly related

to self-reported EBP use and, therefore, were not included in subsequent analyses.

In order to include theoretical orientation and clinical setting in the regression analyses, dichotomized variables were created. For theoretical orientation, practitioners endorsing a behavioral or cognitive-behavioral approach were grouped together and practitioners endorsing other approaches were grouped together. For clinical setting, practitioners working in a hospital or university setting were grouped together and practitioners in other settings were grouped together. These dichotomized variables were included in the regression analyses as control variables.

Predictors of Self-reported Use of EBPs

The results of the hierarchical regression analyses predicting self-reported use of EBPs are summarized in Table 3. To test our first hypothesis, that practitioner training (i.e., taking an EBP class) is related to self-reported EBP use, we used a multiple regression procedure. Practitioner theoretical orientation and clinical setting (dichotomized variables) were entered on the first step and accounted for a significant amount of variance in EBP use. The *EBP class* variable was entered on the second step and predicted a significant amount of unique variance (7.4%) in practitioner self-reported use of EBPs, controlling for practitioner theoretical orientation and clinical setting.

To test the hypothesis that characteristics of the clinical setting predicted self-reported EBP use, a similar regression procedure was used. Practitioner theoretical orientation was entered on the first step to control for the effect of this variable and accounted for a significant amount of variance. The dichotomized clinical setting variable (i.e., hospital/university setting vs. other settings) was entered on the second step and predicted a significant amount of unique variance (5.9%) after controlling for theoretical orientation. The perceived *openness of the clinical setting to EBPs* was entered on the third step and predicted a significant amount of unique variance in self-reported EBP use (13.5%) after controlling for theoretical orientation and type of clinical setting.

In order to test the hypothesis that practitioner attitudes toward treatment research significantly predict self-reported EBP use, we conducted another multiple regression analysis using self-reported EBP use as the dependent variable. Dichotomized variables for theoretical orientation and clinical setting were entered on the first step to control for their effects on EBP use. On the second step, both *positive attitudes toward treatment research* and *negative attitudes toward treatment research* were entered. This step accounted for 21.3% unique variance in self-reported EBP use. Examining the individual standardized beta weights of each scale, both scales were found to predict a unique portion of variance in self-reported EBP use, controlling for the other variables in the analysis.

Mediator Analyses

In order to test potential mediator models, procedures discussed by Baron and Kenny (1986) were used. Since both *positive* and *negative attitudes toward treatment research* predicted unique variance in self-reported EBP use, both were tested as mediators. The attitude variables were tested as mediators for both the relationship between practitioner training and EBP use as well as between clinical setting and EBP use.

First, the hypothesis that *positive attitudes toward treatment research* mediates the relationship between

Table 2 Positive and negative attitudes toward treatment research scales

Item	Mean	SD
Positive Attitudes Toward Treatment Research Scale		
Most treatment research published in the last 10 years is directly relevant to me in my clinical work.	3.01	1.13
Clinical research should be the foundation of clinical practice.	2.53	.99
Researchers understand the needs of practitioners.	3.45	1.19
Clinical research addresses questions that are important to me.	3.28	1.14
$\alpha = .76$		
Negative Attitudes Toward Treatment Research Scale		
Clinical judgment is more important than clinical research in determining appropriate treatment.	3.23	1.17
Efforts to empirically evaluate treatment effects are overly simplistic and therefore of little value to me.	2.52	1.12
Reading and applying research findings is too time-consuming.	2.65	1.15
I would like to apply treatment research in my practice, but most research does not address questions that are important to me.	2.97	1.21
$\alpha = .74$		

Table 3 Summary of hierarchical regression analyses predicting self-reported EBP use

Variable	*B*	SE *B*	*β*	ΔR^2	ΔF
Practitioner training (*N* = 214)					
Step 1				.16	20.24***
Theoretical orientation	–.54	.12	–.29***		
Clinical setting	–.45	.12	–.24***		
Step 2				.07	20.21***
EBP class	.47	.11	.27***		
Clinical setting (*N* = 214)					
Step 1				.10	24.01***
Theoretical orientation	–.60	.12	–.32***		
Step 2				.06	14.81***
Clinical setting	–.45	.12	–.24***		
Step 3				.14	40.38***
Openness of clinical setting to EBPs	.39	.06	.38***		
Attitudes (*N* = 184)					
Step 1				.14	14.87***
Theoretical Orientation	–.56	.13	–.30***		
Clinical setting	.37	.13	.20**		
Step 2				.21	29.60***
Positive attitudes	.08	.02	.31***		
Negative attitudes	–.06	.02	–.25***		

*$p < .05$, **$p < .01$, ***$p < .001$

practitioner training and self-reported EBP use was tested. In earlier analyses, *EBP class* was found to be a significant predictor of EBP use. Likewise, *positive attitudes toward treatment research* was found to be a significant predictor of EBP use. However, *EBP class* and *positive attitudes* were not significantly correlated, eliminating the possibility that *positive attitudes toward treatment research* mediates the relationship between *EBP class* and self-reported EBP use.

Second, we tested the hypothesis that *negative attitudes toward treatment research* is a mediator of the association between *EBP class* and self-reported EBP use. Significant associations between *EBP class* and EBP use ($\beta = .324$) and between *negative attitudes* and EBP use ($\beta = -.441$) were established using regression analyses. To test the association between *EBP class* and *negative attitudes*, a regression using *EBP class* to predict *negative attitudes* was conducted, and a significant negative relationship was found, $R^2 = .038$, $F(1, 182) = 7.21$, $p = .008$. Finally, a multiple regression predicting EBP use was conducted by entering *negative attitudes* on the first step and *EBP class* on the second step. *EBP class* was still a significant predictor of EBP use; however, the standardized beta weight was reduced from .324 to .219 after controlling for *negative attitudes*, suggesting partial mediation. To test the statistical significance of the reduction in beta weight, we used an online calculator to calculate the Sobel test (Preacher & Leonardelli, 2003), yielding a test statistic = 2.50, $p = .012$, suggesting significant mediation.

Third, we tested the hypothesis that *positive attitudes toward treatment research* is a mediator of the relationship between *openness of clinical setting* and self-reported EBP use. Significant relationships between *openness* and EBP use ($\beta = .446$) and between *positive attitudes* and EBP use ($\beta = .485$) were established using regression analyses. To test the relationship between *openness* and *positive attitudes*, a regression using *openness* to predict *positive attitudes* was conducted, and a significant positive relationship was found, $R^2 = .098$, $F(1, 183) = 19.82$, $p < .001$. Finally, a multiple regression predicting EBP use was conducted by entering *positive attitudes* on the first step and *openness* on the second step. *Openness* was still a significant predictor of EBP use; however, the standardized beta weight was reduced from .446 to .291 after controlling for *positive attitudes*, suggesting partial mediation. This reduction in beta weight yielded a Sobel test statistic = 3.63, $p < .01$, suggesting significant mediation.

Fourth, we tested the hypothesis that *negative attitudes toward treatment research* is a mediator of the relationship between *openness* and self-reported EBP use. Significant relationships between *openness* and EBP use ($\beta = .446$) and between *negative attitudes* and EBP use ($\beta = -.441$) were established in previous analyses. To test the relationship between *openness* and *negative attitudes*, a regression using *openness* to predict *negative attitudes* was conducted, and a significant negative relationship was found, $R^2 = .053$, $F(1, 184) = 10.21$, $p = .002$. Finally, a multiple

Table 4 Summary of regression including all significant predictors of EBP use

Variable	*B*	*SE B*	*β*
Theoretical orientation	–.28	.11	–.15*
Clinical setting	–.21	.11	–.11
EBP class	.36	.10	.21***
Openness of clinical setting	.22	.06	.21***
Positive attitudes	.07	.02	.28***
Negative attitudes	–.05	.02	–.19**

Note. $R^2 = .443$, $p < .001$ *$p < .05$, **$p < .01$, ***$p < .001$

regression predicting EBP use was conducted by entering *negative attitudes* on the first step and *openness* on the second step. *Openness* was still a significant predictor of EBP use; however, the standardized beta weight was reduced from .446 to .311 after controlling for *negative attitudes*, suggesting partial mediation. This reduction in beta weight yielded a Sobel test statistic = 2.79, $p < .01$, suggesting significant mediation.

Model for Predicting Self-reported Use of EBPs

In order to test the overall predictive value of theoretical orientation, clinical setting, EBP class, openness of clinical setting, positive attitudes toward treatment research, and negative attitudes toward treatment research, we conducted a multiple regression analysis predicting self-reported EBP use. All six of the predictive variables were entered together, and the whole model was significant, accounting for approximately 44.3% of the variance in EBP use. Examination of the beta weights indicated that positive attitudes toward treatment research was the strongest predictor of practitioner self-reported EBP use, controlling for the other variables in the model (see Table 4 for beta weights of each variable in the model). Multicollinearity was not a problem as each independent variable had a tolerance of .72 or higher.

Discussion

This paper presents the results of a national mental health practitioner survey regarding possible predictors of practitioner self-reported use of EBPs in clinical practice. As hypothesized, practitioner training (i.e., whether or not the practitioner reported taking an EBP class), the culture of the practitioner's clinical setting (i.e., perceived openness to EBPs), and the practitioner's attitudes toward treatment research (both positive and negative attitudes) were significant predictors of self-reported EBP use. Practitioner self-identified theoretical orientation and clinical setting were also significant predictors of self-reported EBP use. The factors each contributed uniquely to the variance in EBP use and together accounted for 44.3% of this variance. The relationship between taking an EBP class and self-reported EBP use was partially mediated by negative attitudes toward treatment research. Similarly, the relationship between perceived openness of one's clinical setting and self-reported EBP use was partially mediated by practitioner attitudes toward treatment research (both positive and negative attitudes).

The finding that practitioner training is related to EBP use is consistent with the growing emphasis on training in EBPs (e.g., APA, 2005; Sholomskas et al., 2005). However, it is important to note that the practitioner's academic degree and years of clinical experience were not related to EBP use in this study. The finding that the perceived openness of a practitioner's clinical setting to EBPs is related to practitioner EBP use supports the importance of *institutional culture toward EBPs*. Decisions to use or not use EBPs in practice are not made in a vacuum, but rather social influences can affect practitioner decisions. As supported by the recent finding that individual practitioners can be heavily influenced by their colleagues and supervisors (Nelson et al., 2006), it is clear that social dynamics within clinical settings must be considered. This finding is consistent with the larger body of innovation diffusion and dissemination literature suggesting that the adoption of innovative health and mental health practices is a social process (e.g., Glisson & Schoenwald, 2005; Greenhalgh et al., 2004; Stirman, Crits-Christoph, & DeRubeis, 2004).

This study also found that attitudes toward treatment research was a significant predictor of self-reported EBP use. That is, practitioners who viewed treatment research as directly relevant to their work were more likely to use EBPs than those who viewed this research as irrelevant to their own practice. This finding is consistent with previous research that has focused on practitioner attitudes toward EBPs in general (e.g., Aarons, 2004; Nelson et al., 2006) and specific components of EBPs (e.g., Addis & Krasnow, 2000). Furthermore, this study found that positive and negative attitudes toward treatment research each predicted unique variance in practitioner self-reported EBP use. This finding suggests that attitudes that are hostile to treatment research are not simply the absence of positive attitudes and that strong negative sentiments toward research significantly decrease the likelihood that a practitioner will use EBPs.

In addition to the findings for EBP training, perceived openness of one's clinical setting to EBPs,

and practitioner attitudes toward treatment research, this study found significant differences in levels of self-reported EBP use based on theoretical orientation and clinical setting. Specifically, practitioners endorsing a cognitive-behavioral or behavioral orientation were more likely to report high levels of EBP use. This finding is not surprising, given the fact that most evidence-based treatments adopt a cognitive-behavioral or behavioral orientation. Similarly, this study found that practitioners in hospital or university settings reported higher levels of EBP use than those in other settings (e.g., private practice, CMHCs, schools). This finding is also consistent with expectations, given that the EBP movement has been more widely embraced in hospitals and university clinics than in other settings. However, caution should be exercised in interpreting these between-group differences given unequal representation of different groups in the sample.

Moving beyond simple correlates of EBP use and attempting to elucidate important processes, this study examined potential mediator models. First, the results indicated that practitioner negative attitudes toward treatment research partially mediated the relationship between perceived *EBP class* and EBP use; however, positive attitudes was not found to be a mediator. These results suggest that practitioners who have taken an EBP class do not necessarily develop positive attitudes toward treatment research, but the class might protect against the development of overly negative attitudes which can, in turn, decrease EBP use. While taking an EBP class likely does not radically change a practitioner's attitude toward treatment research, such classes probably facilitate EBP use by increasing knowledge of EBPs and confidence in using EBPs. From this perspective, EBP classes do not indoctrinate students to value treatment research, but rather provide valuable exposure to EBPs and help develop skills to employ these practices.

This study also found that attitudes toward treatment research (both positive and negative) were partial mediators of the relationship between the perceived openness of one's clinical setting and self-reported EBP use. This finding suggests that a practitioner's clinical setting can affect how that individual views treatment research, which then may affect the individual's willingness to use EBPs. Practitioners who are ambivalent in their feelings toward treatment research but work in a setting that is supportive of EBPs may develop more accepting views of the research that underlies EBP and, ultimately, use EBPs more often. Conversely, practitioners who are ambivalent toward treatment research but work in a setting that is hostile toward EBPs might internalize their setting's negative attitudes toward treatment research and reject EBPs as the product of irrelevant research.

Implications for Clinical Training, Research and EBP Dissemination

Within the context of the general movement to increase the use of EBPs in clinical practice, the results of this study suggest several implications for clinical training, research, and EBP dissemination. In the area of training, this study highlights the importance of EBP classes in facilitating EBP use. The relationship between taking an EBP class and self-reported EBP use was highly significant, even after controlling for theoretical orientation and clinical setting. This finding suggests that EBP classes are important mechanisms for exposing future practitioners to EBPs and providing requisite knowledge for later use. Furthermore, these results suggest that EBP training can be valuable for clinicians from different academic disciplines and theoretical orientations. While this study appears to support the emphasis on EBPs in APA's training standards, we suggest that areas not governed by APA training policies (e.g., master's-level programs, social work training) also offer coursework in EBPs as a regular component of training.

In the area of clinical research, the findings from this study suggest considerable variability in how treatment research is perceived by practicing clinicians, possibly contributing to variability in the use of EBPs in practice. This variability is likely the result of the historical emphasis on highly controlled ''efficacy'' studies in the treatment literature. The relevance of such research to practitioners has been debated (see Persons & Silberschatz, 1998), and recent research has suggested that some practitioners might be more open to applied ''effectiveness'' research conducted in clinical settings (Nelson et al., 2006). In order to improve practitioner attitudes toward treatment research, and consequently promote greater use of EBPs, we encourage researchers to conduct more treatment research in clinical settings. This recommendation is consistent with NIMH (1998) calls for effectiveness studies, and more applied research has begun to emerge in the treatment literature (e.g., Brown, Read, & Kahler, 2003; Flannery-Schroeder, Suveg, Safford, Kendall, & Webb, 2004; Lenze et al., 2003).

With regard to efforts to disseminate EBPs into clinical settings, the findings concerning institutional openness to EBPs are particularly instructive. Consistent with previous research highlighting the social nature of the dissemination process (see Stirman et al.,

2004 for review), the results from this study suggest the need to work to facilitate a positive EBP culture within individual treatment institutions. Given the importance of influential colleagues and supervisors (Nelson et al., 2006), dissemination efforts should target key opinion leaders within institutions (e.g., supervisors, administrators, well-respected clinicians; Smith-Boydston & Nelson, in press) in order to foster the development of a clinical setting that is open to using EBPs. In an atmosphere that is open to and supportive of EBPs, practitioners may be more willing to make efforts to overcome challenges to using EBPs.

Limitations of this Study

A number of limitations of this study should be noted. Each of the variables considered in this study were assessed only using self-report. Therefore, the relationships observed between the variables might be partially attributable to common-method variance. Furthermore, because practitioner EBP use was assessed using only self-report, this measure might have been subject to a social desirability bias. As we have already noted, the mental health services field has experienced a shift toward endorsing EBPs, and practitioners may have felt pressure to report high levels of EBP. However, the anonymous nature of the online survey likely limited the influence of any self-report bias. Future investigations should seek indicators of EBP use that do not rely on self-report. For example, supervisor reports of practitioner EBP use, case notes, and tapes of treatment sessions might provide more information regarding practitioner EBP use.

A related limitation of this study is that EBP use was assessed using a single question (i.e., *How often do you use evidence-based practices in your clinical work?*). EBP is likely a multidimensional construct, and future investigations should use multiple indicators to assess practitioner EBP use. At the time of this study, we knew of no published, reliable and valid measures of EBP use; however, given the increasing emphasis on EBP in the literature, such measures are likely to emerge soon. As these measures become available, we encourage researchers to replicate and expand on our findings using a validated multidimensional measure of practitioner EBP use. It is also worth noting that practitioner EBP use was assessed on a 4-point scale, which may have failed to fully capture the continuum of practitioner EBP use in the field. Despite these measurement limitations, this study found strong predictors of self-reported EBP use and serves as a foundation for research investigating the full range of EBP use.

Another limitation of this study is that participants were not provided a standard definition of ''evidence-based practices,'' and instead used their own definitions of this construct. With somewhat varying definitions available (e.g., compare the New Freedom Commission and APA definitions), participant conceptualizations may not have been uniform. Given the historical emphasis on treatments with research support in defining ''evidence-based,'' survey respondents likely focused on their use of such protocols in responding to the question ''*How often do you use evidence based practices in your clinical work?*'' This conceptualization is consistent with the New Freedom Commission's definition of EBPs and also with the frequently used term ''evidence-based treatments'' (EBTs). It is worth noting, however, that the APA definition of EBP encompasses the use of such treatments but also emphasizes clinical expertise and client context (APA, 2005). Clinical expertise and client context were not directly assessed in this survey, and future surveys may benefit from explicit measurement of these constructs. Despite the potential for somewhat varying definitions of EBP use by participants, strong and theoretically relevant relationships were observed in predicting self-reported EBP use. Future research in this area, however, should avoid this limitation and provide a standard definition of ''evidence-based practices'' for respondents.

The measurement of perceived openness of the clinical setting is another potential limitation of this study. Although a significant relationship between openness of the clinical setting and EBP use, openness was measured by only one question on the practitioner's perception of setting openness to EBPs. Institutional culture is likely a complex and multidimensional construct that can be measured in more sophisticated ways. However, the single indicator of institutional openness appears appropriate given the exploratory nature of this study and the limited investigation of this construct in the literature. Building on this study, future research should more fully investigate institutional culture in order to allow for a more thorough understanding of this construct and its relationship to EBP use.

While the investigation of several mediator models attempts to address an important and relatively new question within the EBP literature, these analyses are perhaps best viewed as preliminary. The *positive* and *negative attitudes toward treatment research* scales represent a first attempt to measure these constructs and can likely be improved. Building on our results, future studies may benefit from expanding and revising these scales and using these improved measures in

further investigating the role of practitioner attitudes in treatment decisions.

Finally, in addition to the measurement concerns expressed above, the representativeness of the sample in this study is unknown. The survey had a relatively low response rate and we cannot be sure that those who responded to the survey are representative of the larger group of mental health practitioners in the United States. Previous practitioner survey research (e.g., Beutler, Williams, Wakefield, & Entwistle, 1995; Kazdin, Siegel, & Bass, 1990) has sampled national registers of practicing doctoral-level psychologists. While such methods simplify recruitment, they limit the potential participants to those with presumably similar training (e.g., Ph.D. program in clinical psychology) and do not capture the range of professionals providing clinical services. Since we were interested in studying not only Ph.D.-level psychologists but also master's-level psychologists and social workers, we chose to employ multiple methods of identifying and recruiting potential participants. We know of no national listings of mental health practitioners in various disciplines that would have provided the diversity that we were seeking in this sample. Despite the challenges in identifying and recruiting our sample, we believe that the diversity of this sample is a major strength. It is also worth noting that practitioner characteristics such as academic degree and years of experience were not significantly related to self-reported EBP use. Still, recognizing the potential limitations of our sample, we invite future researchers to validate the findings of this study in large representative samples of clinicians.

Conclusions and Future Directions

This paper presents the results of a preliminary investigation of the predictors of practitioner self-reported use of EBPs. Despite some measurement limitations, the predictors tested in this study accounted for approximately 44% of the variance in practitioner self-reported EBP use. We believe that this paper contributes to the developing practice research literature and provides helpful recommendations for clinical training, EBP dissemination efforts, and future research. We encourage researchers to build upon our model and work to measure EBP use and its predictors in increasingly sophisticated ways. As the measurement of these constructs improves, we expect the predictive value of EBP use models to continue to increase, allowing for a greater understanding of the processes by which practitioners select and implement EBPs.

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