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Predicting Adoption of Exposure Therapy in a Randomized Controlled Dissemination Trial

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Abstract

The present study examined organizational, client, and therapist characteristics as predictors of use of and proficiency in exposure therapy (ET) after training. Therapists naïve to ET (N=181) were randomized to: (1) online training (OLT), (2) OLT plus motivational enhancement (ME), or (3) OLT + ME plus a learning community. Twelve weeks after training, self-reported use of ET in clinical practice was high (87.5%) and therapists demonstrated moderate clinical proficiency. Use of ET was predicted by therapist degree, self-efficacy, and knowledge. Clinical proficiency was predicted by therapist anxiety sensitivity, attitudes, and knowledge, as well as organizational and client barriers. Several of these effects were moderated by training condition, indicating that therapists who received more comprehensive training were less impacted by barriers and showed enhanced adoption in the presence of facilitating factors. Overall, these results suggest that the primary barriers to the adoption of ET are therapist, not organizational or client, factors.

Keywords

Dissemination; Implementation; Online Training; Exposure Therapy; Anxiety Disorders

1. Introduction

Exposure therapy (ET) has the dubious distinction of being one of the most empirically supported yet least used psychological treatments. Despite extensive research demonstrating that ET has large effects on each of the anxiety disorders (for a review see Norton & Prince, 2007), both therapists and anxiety disorder clients report that it is rarely implemented in clinical practice. Indeed, as few as 7% of therapists and clients report delivering or receiving ET, respectively (Becker, Zayfert, & Anderson, 2004; Freiheit, Vye, Swan, & Cady, 2004; Goisman, Warshaw, & Keller, 1999; Marcks, Weisberg, & Keller, 2009; Rosen et al., 2004). Although the urgent need to reduce the gap between research and clinical practice is widely recognized, efforts to increase the use of evidence-based practices (EBPs) such as ET have been hampered by a lack of knowledge about the factors that promote or interfere with adoption.

A necessary first step in making ET more widely available to consumers is to increase the number of therapists trained to deliver this treatment, as only 12–28% of psychologists have

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received training in exposure procedures (Becker et al., 2004). Several randomized controlled trials have evaluated methods of training therapists in ET, with results indicating that computer-based or online training is an effective and cost-efficient method of increasing knowledge of ET (Gega, Norman, & Marks, 2006; Harned, Dimeff, Woodcock, & Skutch, 2011; McDonough & Marks, 2002). However, efforts to train therapists in ET are only successful if they lead to adoption; that is, the use of ET in a clinically proficient manner (Turner & Sanders, 2006). Prior research indicates that the majority of therapists trained in ET rarely if ever use the treatment in their clinical practice. For example, 46% of psychologists trained in imaginal exposure for posttraumatic stress disorder (PTSD) report that they never use the procedure and 25% report that they use the procedure with less than half of their PTSD patients (Becker et al., 2004). In addition, there is some evidence that the rate of adoption may be lower for exposure than for other evidence-based techniques. For example, among therapists who received workshop training in trauma-focused cognitive-behavioral therapy, chart review in the three months following training indicated that no therapists reported using the exposure component of this treatment, whereas all other techniques (e.g., anxiety management, cognitive restructuring, parent training) were used by at least some therapists (Jensen-Doss, Cusack, & Arellano, 2008). These findings highlight the importance of identifying barriers to the adoption of ET among trained therapists, while also suggesting that there may be barriers that are particularly difficult and/or possibly unique to ET.

The systems-contextual model of dissemination and implementation (Beidas & Kendall, 2010; Turner & Sanders, 2006) provides a framework for conceptualizing the multiple contextual variables that may impact the effect of training on subsequent therapist behavior. This model proposes that *organizational characteristics* are likely to influence therapist decisions to adopt a newly learned treatment. Surveys of mental health providers have found that greater perceived openness of an organization to EBPs, working in a hospital or university setting, and the availability of supervision predict increased use of and/or proficiency in EBPs (Baer et al., 2009; McFarlane et al., 2001; Nelson & Steele, 2007; Shapiro, Prinz, & Sanders, 2012). In addition, *client characteristics* are expected to impact adoption. This may be particularly true for ET, as therapists often believe that ET is inappropriate for many (if not most) clients, particularly those with more severe or complex clinical presentations (e.g., Becker et al., 2004; van Minnen, Hendriks, & Olff, 2010). In addition, therapists identify client resistance as a common obstacle to using ET, including problems such as unwillingness to give up safety behaviors, resistance to the directiveness of the treatment, and beliefs that their fears are realistic (APA Division 12, 2010). *Therapist characteristics* are theorized to also play a significant role in the decision to adopt a newly learned treatment. Therapists who identify as cognitive-behavioral in orientation, have fewer years of clinical experience, and have a higher level of education have been found to be more open to learning and using EBPs (Aarons, 2004; Baer et al., 2009; Nelson & Steele, 2007; Stewart, Chambless, & Baron, 2011). In addition, therapists who report greater self-efficacy and knowledge after training are more likely to subsequently use the treatment in their clinical practice (Shapiro et al., 2012). Therapist attitudes may be a particularly significant barrier to the adoption of ET given common (but not empirically supported) beliefs that ET is excessively distressing, contraindicated for many clients, and likely to result in symptom exacerbation and dropout (Olatunji, Deacon, & Abramowitz, 2009). Another common therapist concern about using ET is that it may be too anxiety-provoking for therapists (Skutch et al., 2009), suggesting that therapists with higher anxiety sensitivity may be less likely to adopt ET. Finally, this model proposes that adoption is influenced by the *quality of training*, with adoption more likely to occur when the training addresses each level of the systems-contextual model.

The present study evaluates predictors of adoption of ET using data from a randomized controlled dissemination trial. Primary outcomes from this larger trial are reported elsewhere (Harned et al., under review), and the present study involves secondary analyses to determine which organizational, client, and therapist characteristics promote or interfere with use of and clinical proficiency in ET twelve weeks after training. Consistent with the literature reviewed above, we hypothesized that therapists with more education, a cognitive-behavioral orientation, less clinical experience, lower anxiety sensitivity, greater knowledge of and self-efficacy in ET, and more positive attitudes toward ET would exhibit higher rates of clinical use and proficiency following training. In addition, we hypothesized that organizational barriers (e.g., lack of organizational support for using ET) and client barriers (e.g., client resistance to ET) would interfere with adoption. Finally, we hypothesized that type of training would moderate the effects of other contextual variables on adoption. In particular, we predicted that therapists who received the most comprehensive training that addressed multiple levels of the systems-contextual model would be less impacted by potential barriers to adoption and would show enhanced adoption in the presence of facilitating factors.

2. Method

2.1 Procedures

2.1.1 Recruitment and screening—All procedures were approved by the Western IRB. Participant enrollment began in November 2011 and the final follow-up assessment occurred in July 2012. Participants were recruited via fliers sent to administrators at mental health agencies, posting emails to several listservs for mental health providers, advertising in our organizational newsletter, and contacting individuals who had previously expressed interest in participating in future studies. Interested individuals were directed to complete a secure online screening questionnaire to determine eligibility. Inclusion criteria were: (1) currently working as a mental health treatment provider or a student in a mental health-related field, (2) currently providing individual therapy to at least three clients with an anxiety disorder, (3) planning to continue providing individual therapy to clients with anxiety disorders for the duration of the study, (4) has access to the technology required to complete the study training methods, (5) able to commit to the time requirements necessary to complete the study, (6) has a Bachelor's degree or higher, and (7) has no more than minimal prior exposure to ET. More than minimal prior exposure to ET was defined as: (1) clinical experience using ETs (i.e., had provided eight or more sessions of an ET or received clinical supervision focused on ETs), (2) training specifically focused on ETs (i.e., a quarter- or semester-long graduate course, a 12-hour or longer didactic training, or a study/consultation group focused on learning any ET), (3) previously viewed any of the OLT used in this study or two other OLTs of an exposure-based treatment developed by our group, or (4) read more than half of any treatment manual for an ET in the past three years. Overall, 861 individuals completed the online eligibility screen of whom 512 did not meet inclusion criteria (325 had more than minimal prior exposure to ETs, 94 were not providing therapy to at least three clients with an anxiety disorder, 69 did not have time for the study during the study period, 22 did not have access to the required technology, and 2 were not mental health treatment providers or a student in training with at least a Bachelor's degree). An additional 73 individuals were found to be eligible but were initially placed on a waitlist and later declined to participate when offered the opportunity.

2.1.2 Randomization—Following the online screening, the remaining eligible participants (n=276) were assigned to one of the three study conditions via a randomization minimization procedure (White & Freedman, 1978). Participants were matched on educational degree (1=MD/PhD or doctoral candidate; 2=MA/MS or current graduate

student; 3= BA/BS level), student status (1=Yes; 2=No), clinical experience (1=less than 3 years; 2=3–6 years; 3=more than 6 years), number of individual clients on their caseload (1=3–11; 2=12–30; 3=31 or more), and self-reported level of technology competence (1=low confidence (1–3); 2=moderate confidence (4–7); 3=high confidence (8–10)).

2.1.3 Informed consent—Randomized participants completed the informed consent process by viewing an online video describing the study procedures, taking an online survey to assess their understanding of the study procedures, reviewing questions with research staff via phone as needed, and then downloading and returning a signed copy of the consent form to research staff.

2.1.4 Experimental procedures—Upon completion of the baseline assessment, participants received an email with information about how to access their online training (OLT). Participants were asked to complete the OLT within a 6-week training phase, but were given access to the OLT for the entire 18 weeks of the study. One week after receiving access to the OLT and one week prior to the post-training assessment, participants were contacted by research staff (via phone or email) to assess progress through the course and offer technical support as needed. Participants completed outcome assessments at post-training (6 weeks), 6-week follow-up (12 weeks), and 12-week follow-up (18 weeks). All assessments were completed primarily via an online survey with the exception of a performance-based role-play that was conducted via phone. Participants were paid for completing the training course and for each completed assessment and those who completed all study assessments received a bonus payment. No adverse events occurred.

2.1.5 Subject flow and retention—Of the 276 individuals who were randomized to a training condition, 95 did not complete the baseline assessments. The remaining 181 participants who completed the baseline assessment constitute the “intent-to-train” (ITT) sample. The present study uses baseline data as well as data from the post-training and the 12-week follow-up assessments, which had rates of assessment completion of 80.1% and 76.2% respectively.

2.2 Training Conditions

2.2.1 Online Training (OLT; n=60)—The OLT was developed utilizing best practices from product development models, including formative evaluation and iterative design. The final 10-hour course, *Foundations of Exposure Therapies* (behavioraltech.org/ol/details_exp.cfm), was built in Flash and utilizes cutting-edge instructional design and gaming technology. To maximize learner control and flexibility, users can choose to review structured didactic materials and/or learn experientially by engaging in simulated clinical scenarios in which they implement ET procedures. Didactic information is presented in four interactive, media-rich eBooks (224 pages) that provide learners with the foundational knowledge necessary to complete the clinical scenarios. In addition, the course includes a variety of informational resources (e.g., videos of exposure experts, example treatment forms, a list of treatment manuals). Experiential learning occurs via up to 35 simulated clinical scenarios in which learners treat six virtual anxiety disorder clients and receive feedback on their performance. Consistent with gamification principles, the scenarios are scaffolded by level of difficulty and assigned based on the individual learner’s performance. To finish the course, learners must successfully complete the most difficult scenario in each of five core content areas: orienting, constructing exposure hierarchies, planning exposure tasks, conducting exposure, and debriefing exposure/reviewing homework.

2.2.2 Online Training plus Motivational Enhancement (OLT + ME; n=60)—In addition to receiving the OLT, participants in this condition received two brief motivational

enhancement (ME) interventions aimed at addressing potential attitudinal barriers to learning and using ETs. The first intervention consisted of a brief (5-minute) video that played when participants first accessed the OLT (www.youtube.com/watch?v=JCXitNs_JEc). The video was designed to be similar to a public service announcement, with the goal of increasing clinician interest in learning and using ETs. The second intervention occurred immediately upon completing the OLT, when participants were directed to complete an additional online module involving a simulated conversation with a “virtual ET consultant.” The virtual consultant utilized a variety of strategies derived from Motivational Interviewing (Miller & Rollnick, 1991) in an effort to decrease ambivalence about using ETs. The virtual consultant assessed the degree to which participants endorsed five common negative beliefs about ETs (e.g., that ET causes patients to get worse or drop out, that ET isn’t appropriate for more complex clients) and provided individually-tailored feedback to address each of these concerns. In addition, the virtual consultant asked participants to identify any other barriers that might interfere with using ETs, generate potential solutions, and plan next steps. At the end of the module, participants received a printable personal feedback form that summarized their responses.

2.2.3 Online Training plus Motivational Enhancement plus Learning

Community (OLT + ME + LC; n=61)—In addition to receiving the OLT and ME interventions, participants in this condition were provided with eight one-hour learning community (LC) meetings facilitated by an experienced ET clinician. LC meetings occurred via an online conferencing platform (www.webex.com) and included up to eight therapist participants. LC facilitators followed a structured curriculum that included specific discussion points, exercises, and homework assignments for each LC meeting. The first five meetings occurred weekly during the training phase of the study (weeks 2–6) and targeted knowledge acquisition (by reviewing and discussing assigned content from the OLT) and active practice (by engaging in role-plays and completing practice assignments as homework). The final three meetings occurred bi-weekly during an implementation phase (weeks 7–12) and targeted increasing use of and clinical proficiency in ET in clinical practice. These meetings focused on case presentation and consultation as well as problem-solving barriers to implementation.

2.3 Measures

The outcomes in this study were self-reported clinical use and observer-rated clinical proficiency at the final follow-up assessment (12 weeks post-training). Predictor variables fell into three domains: (1) organizational characteristics, (2) client characteristics, and (3) therapist characteristics.

2.3.1 Outcomes

2.3.1.1 Clinical use: The Exposure Therapy Clinical Use survey assessed self-reported use of nine ET procedures. Items were developed for the purposes of this study to reflect the procedures taught in the OLT (e.g., orient to the rationale for exposure therapy, create an exposure hierarchy, conduct in vivo exposure). For each item, participants reported how many times they had used that procedure in the past six weeks. To increase accuracy, participants were provided with a tracking log at the beginning of the study to record any use of exposure procedures in their clinical work. Items were summed to create a total count score for analysis (Cronbach’s alpha = .85).

2.3.1.2 Clinical proficiency: Structured role-plays were used to assess participants’ proficiency in applying ET in simulated clinical scenarios. Three brief (up to 20-minute) role plays were developed and evaluated for equivalency with feedback from ET experts. Each role-play required participants to orient a client actor to the rationale for and goals of

ET and then conduct a brief exposure task. Research assistants who were blind to participants' condition portrayed the fictional clients using semi-structured scripts. Role plays were conducted and digitally recorded via telephone. A coding instrument was developed and iteratively pilot tested using both ET-naïve and expert ET clinicians to determine reliability and construct validity. The final measure includes an Orienting subscale (7 items) and an Exposure subscale (3 items). Orienting subscale items assessed proficiency at orienting to the role of problematic beliefs and avoidance in maintaining fear, obtaining client examples of these maintaining factors, orienting to the goals of exposure, and providing instructions for the specific exposure task. Exposure subscale items assessed proficiency at assessing the client's level of distress during the exposure task, addressing avoidance/safety behaviors during exposure, and engaging in effective therapist behaviors during exposure (e.g., conducting the exposure for the specified duration and without modifying it to make it easier). A global Clinical Proficiency score was computed that ranged from 0 (no proficiency) to 5 (excellent proficiency). A random sample (10% of all role plays) was coded for reliability between an expert ET clinician and an extensively trained coder and inter-rater reliability was excellent ($ICC = .85$).

2.3.2 Organizational Predictors

2.3.2.1 Organizational barriers: Eight items from the Barriers survey (Dimeff et al., 2009) were used to assess common organizational barriers to using a newly learned treatment in clinical practice at post-training. Items were adapted to refer to "exposure therapy (ET)" (e.g., "Administration/agency is not supportive of using ET") and several items assessing ET-specific barriers were added (e.g., "Unable to leave the clinic/office with clients to do exposure tasks in other settings"). Participants were asked to indicate how much each barrier interfered with their ability to learn and apply exposure therapy on a 4-point Likert scale ranging from 1 = "N/A or No impact" to 4 "Significant impact." A mean total score was used for analysis (Cronbach's $\alpha = .75$).

2.3.2.2 Clinical setting: Participants' primary work setting was assessed at baseline and responses were recoded into three categories for analysis: 1 = private practice, 2 = outpatient treatment program, 3 = non-outpatient treatment (e.g., day treatment, residential, inpatient, corrections).

2.3.3 Client Predictors

2.3.3.1 Client barriers: Three items from the Barriers survey (Dimeff et al., 2009) were used to assess client-related barriers to using ET (e.g., "Clients are accustomed to the treatment they have had, and are resistant to change."). Therapists were asked to rate how much each barrier interfered with their ability to learn and apply ET on a 4-point Likert scale ranging from 1 = "N/A or No impact" to 4 "Significant impact." Items were analyzed individually given their low inter-item correlations (average $r = .13$).

2.3.4 Therapist Predictors

2.3.4.1 Professional characteristics: Participants' professional characteristics were assessed at baseline, including: (1) highest academic degree (recoded to 1 = Bachelor's level (BA, BS, RN), 2 = Master's level (MA, MS, MSW, MFT), 3 = Doctoral level (PhD, PsyD, MD, or doctoral candidate), (2) years of experience working as a treatment provider since receiving their degree, and (3) theoretical orientation (recoded to 0 = Not cognitive and/or behavioral and 1 = Cognitive and/or behavioral).

2.3.4.2 Knowledge: A 49-item multiple choice instrument (with 4–6 response choices per item) was developed to assess knowledge of course content as well as ability to apply

knowledge in hypothetical clinical scenarios. The score used for analysis was the proportion of items correct at post-training.

2.3.4.3 Self-efficacy: An adapted 27-item version of the self-efficacy subscale of the Behavioral Anticipation and Confidence Questionnaire (BAQ; Dimeff et al., 2009) measured participants' confidence in their ability to use ET at post-training. All items began with "I feel confident in my ability to" and an example item is "Conduct imaginal exposure." Items were rated on a 5-point Likert scale ranging from 1 = "Not Confident" to 5 = "Very Confident." The score used for analysis was the mean across items at post-training (Cronbach's alpha = .95).

2.3.4.4 Attitudes toward ET: The 22-item Attitudes Toward Exposure Therapy scale (ATET; Harned et al., 2011) assessed participants' beliefs about ET at post-training using a mixture of positive (e.g., "Exposure therapy is effective for real-world patients with complex problems") and negative items (e.g., "Exposure therapy is too emotionally distant or "cold" for my liking"). Items were rated on a 5-point Likert scale ranging from 1 = "Not at all" or "Strongly disagree" to 5 = "Very much so" or "Strongly agree". A total score was created by averaging all items with higher scores representing more negative attitudes toward ET (Cronbach's alpha = .85).

2.3.4.5 Anxiety sensitivity: The 16-item Anxiety Sensitivity Index (Reiss, Peterson, Gursky, & McNally, 1986) assessed participants' fear of anxiety-related sensations at baseline (e.g., "It scares me when I am nervous"). Items were rated on a 5-point Likert scale ranging from 0 = "Very little" to 4 = "Very much". A total score was created by summing all items (Cronbach's alpha = .89).

2.4 Analysis Strategy

Analyses examined the effects of organizational, client, and therapist characteristics, as well as their interactions with training condition, on two outcomes: clinical use of and clinical proficiency in ET. Analyses were performed using the Generalized Linear Model (GLM) procedure, treating clinical use as a count variable with a negative binomial distribution and clinical proficiency as a continuous variable with a normal distribution. The large number of organizational, client, and therapist predictors (n=12) relative to the sample size precluded the inclusion of all predictors in a single GLM model. Instead, for each outcome, analyses were conducted in two steps. The first step was to identify predictors that were related to each outcome by running separate GLM models for each predictor and outcome combination. Each of these models also included an interaction term between training condition and the predictor variable, as well as a main effect for training condition. The effects of specific interest for the purposes of this study were the organizational, client, and therapist characteristics and their interactions with training condition. To allow for examination of the multivariate effect of predictors, in a second step a GLM model was run that included all of the significant predictors and interactions identified in the first models. For all GLM models, continuous predictors were centered prior to analysis and calculation of interactions. Baseline data were used for stable predictor variables (professional characteristics and anxiety sensitivity), whereas post-training data were used for predictors that may have changed during the course of training (organizational and client barriers, therapist knowledge, self-efficacy, and attitudes). Data for both outcomes were from the final follow-up assessment at 12 weeks post-training.

3. Results

3.1 Descriptive Analyses

3.1.1 Sample characteristics—The demographic and professional characteristics of the intent-to-train sample ($N=181$) are shown in Table 1. Therapists were primarily female (71.3%), Caucasian (72.1%), cognitive-behavioral in orientation (56.1%), and working as a Master's level social worker or counselor (56.2%) in an outpatient community mental health center (41%).

3.1.2 Barriers to learning and using ET—Descriptive data on the frequency of organizational and client barriers to learning and using ET at post-training are presented in Table 2. The most common barriers reported were: (1) no regular clinical supervision available ($M = 2.65$), (2) unable to leave the clinic/office to do exposure in other settings ($M = 2.46$), and (3) unable to conduct therapy sessions lasting longer than one hour ($M = 2.40$).

3.2 Predicting Clinical Use of Exposure Therapy

Overall, 87.5% of therapists reported using at least one ET procedure in the six weeks prior to the final follow-up assessment. The frequency of self-reported use of each of the nine ET procedures is shown in Table 3 and therapists reported using ET procedures an average of 25.46 times ($SD = 37.00$). The frequency of self-reported clinical use did not differ by training condition ($F(2, 133) = 1.15, p = .32$). To address over-dispersion issues, extreme outliers (i.e., subjects with clinical use scores greater than 2 SDs above the mean) were recoded to a maximum value of 100 for the GLM analyses.

3.2.1 Organizational characteristics—As shown in Table 4, GLM analyses examining the association of organizational barriers and clinical setting on use of ET were not significant.

3.2.2 Client characteristics—GLM analyses evaluating the effect of each of three client barriers on use of ET were not significant (Table 4).

3.2.3 Therapist characteristics—Three GLM models examining the impact of therapist characteristics on use of ET were significant (Table 4). Academic degree was associated with clinical use and this effect was moderated by training condition. As shown in Figure 1, therapists in OLT reported similar (moderate) use of ET irrespective of academic degree, whereas clinical use and academic degree were positively associated among therapists in OLT + ME and OLT + ME + LC. In both multi-component training conditions, doctoral level therapists reported the most frequent use of ET followed by master's level therapists and bachelor level therapists. Therapist self-efficacy at post-training also significantly predicted use of ET and this effect was moderated by training condition. Self-efficacy was most related to clinical use in the OLT + ME + LC condition, with the greatest differentiation seen between therapists with high confidence in their ability to deliver ET (Figure 1). Among therapists with high self-efficacy, those in OLT + ME + LC reported more frequent clinical use than those in the other two conditions. Knowledge of ET at post-training was associated with clinical use of ET irrespective of training condition, with greater knowledge predicting less frequent use of ET ($B = -1.47, SE = 1.17$). Therapists' theoretical orientation, clinical experience, anxiety sensitivity, and attitudes were not significantly associated with use of ET.

3.2.4 Combined model—A GLM analysis that included all significant predictor main effects and interaction terms from the individual models was significant (Likelihood ratio $\chi^2(12) = 36.04, p < .001$). In this model, clinical use was significantly associated with less

knowledge (Wald $\chi^2(1) = 5.45, p < .02$), higher academic degree (Wald $\chi^2(2) = 14.50, p = .001$), the interaction between academic degree and training condition (Wald $\chi^2(4) = 10.55, p < .04$), and the interaction between self-efficacy and training condition (Wald $\chi^2(2) = 7.97, p < .02$). The main effect of self-efficacy on clinical use was not significant ($p = .07$).

3.3 Predicting Clinical Proficiency in Exposure Therapy

On average, therapists demonstrated moderate clinical proficiency in implementing ET in simulated role-plays at 12-weeks post-training ($M = 3.03, SD = 0.69$). There was a significant difference in clinical proficiency between training conditions ($F(2, 123) = 4.38, p < .05$), with therapists in OLT + ME + LC ($M = 3.25, SD = 0.69$) outperforming those in OLT ($M = 2.81, SD = 0.59$). Review of the GLM analyses will focus on the effects of primary interest to this study; namely, the predictor main effects and interactions with training condition.

3.3.1 Organizational characteristics—As shown in Table 5, greater organizational barriers to learning and using ET predicted less clinical proficiency ($B = -0.20, SE = 0.17$) irrespective of training condition. Clinical setting was not associated with clinical proficiency in ET.

3.3.2 Client characteristics—There was a significant interaction between the client barrier of not currently working with anxiety disorder clients and training condition in predicting clinical proficiency (Table 5). Specifically, therapists in OLT + ME + LC who were high on this client barrier demonstrated greater clinical proficiency in ET than therapists high on this barrier in the other two training conditions (Figure 2). As shown in Table 5, the two other client barriers were not predictive of clinical proficiency in ET.

3.3.3 Therapist characteristics—Three therapist characteristics were associated with clinical proficiency in ET (Table 5). Greater anxiety sensitivity at baseline ($B = -0.04, SE = 0.01$) and more negative attitudes toward ET at post-training ($B = -0.31, SE = 0.20$) significantly predicted less clinical proficiency irrespective of training condition. In addition, greater knowledge of ET at post-training significantly predicted more clinical proficiency and this effect was moderated by training condition. Therapist knowledge was most associated with clinical proficiency for therapists in OLT + ME + LC, with the greatest differentiation among therapists with high knowledge (Figure 2). Among therapists with high knowledge, those in OLT + ME + LC demonstrated greater clinical proficiency than those in the other two training conditions. Therapists' academic degree, theoretical orientation, clinical experience, and self-efficacy were not significantly associated with clinical proficiency in ET.

3.3.4 Combined model—A GLM analysis that included all significant predictor main effects and interaction terms from the individual models was significant (Likelihood ratio $\chi^2(11) = 28.18, p < .01$). In this model, clinical proficiency was only significantly associated with greater knowledge (Wald $\chi^2(1) = 14.46, p < .001$). The main effects of attitudes, anxiety sensitivity, organizational barriers, and not working with anxiety disorder clients were not significant (p 's $> .52$). In addition, the interactions between training condition and knowledge as well as training condition and not working with anxiety disorder clients were not significant (p 's $> .36$).

4. Discussion

Efforts to make ET more widely available to the clients who need it must focus not only on training therapists to deliver the treatment, but also on addressing the factors that are likely

to either promote or interfere with adoption. The present study represents an important step towards identifying organizational, client, and therapist factors that are likely to influence the decision to adopt ET among trained therapists, while also providing useful information about how training can both reduce the negative impact of barriers and enhance the positive effects of facilitators of adoption.

Overall, the training methods used in this study were quite successful in getting therapists with no or minimal prior experience in ET to begin to use this treatment in a clinically proficient manner. A majority of therapists (87.5%) reported at least some use of ET in their clinical practice at twelve weeks post-training, with ET procedures being used an average of 25 times in the prior 6 weeks, including conducting actual exposure tasks (interoceptive, imaginal, and/or in vivo) an average of 6 times. In addition, therapists became moderately proficient in delivering ET in simulated role-plays. Within the context of these generally positive findings, several contextual variables were found to predict higher or lower levels of use and proficiency.

Use of ET in clinical practice was predicted by academic degree as well as therapist self-efficacy and knowledge at post-training. As hypothesized, therapists with more formal education and greater confidence in their ability to deliver ET after training were generally more likely to report using ET in their clinical practice. This is consistent with prior research indicating that higher education level is associated with more positive attitudes toward EBPs (Aarons, 2004) and greater clinical proficiency following training (Baer et al., 2009), as well as research finding that greater self-efficacy after training predicts subsequent use (Shapiro et al., 2012). In addition, therapists with doctoral and master's level degrees reported particularly enhanced clinical use in both of the multi-component training conditions, whereas therapists high in self-efficacy who received the most comprehensive training (OLT + ME + LC) reported the highest levels of clinical use. These findings indicate that the quality of training, particularly training that addresses multiple contextual levels in the implementation process, is likely to enhance the positive effects of these facilitators on subsequent use of ET. Unexpectedly, greater therapist knowledge at post-training predicted less rather than more use of ET. It is possible that more knowledgeable therapists may be more discriminating in terms of what constitutes use of ET and/or they may focus on thoroughly learning the treatment before beginning to use it widely. Additional research is needed to replicate, and evaluate the reasons underlying, this inverse relationship between therapist knowledge and clinical use.

As hypothesized, both organizational and client barriers interfered with achieving clinical proficiency in ET. Therapists working in organizations with more perceived barriers to learning and using ET demonstrated less clinical proficiency, a finding consistent with research on the dissemination of other EBPs (e.g., Baer et al., 2009). Many of the organizational barriers assessed in the present study (e.g., lack of support or supervision for using ET, inability to conduct exposure tasks outside the office) would likely reduce therapists' ability to practice or receive feedback on newly learned ET skills, perhaps resulting in less proficiency. Similarly, therapists who were not working with anxiety disorder clients at post-training achieved less proficiency in ET, likely as a result of having fewer opportunities to practice using the skills they learned in the training. Importantly, therapists who participated in a learning community as part of their training were less impacted by this client barrier. This is likely due to the fact that therapists engaged in active practice (role-plays) during learning community meetings and were given assignments to practice specific ET procedures each week (with colleagues or friends if they did not have appropriate clients).

Consistent with hypotheses, clinical proficiency in ET was also predicted by several therapist characteristics, including anxiety sensitivity, attitudes, and knowledge. Therapists with higher anxiety sensitivity at baseline were less proficient in implementing ET. Given their discomfort with the experience of anxiety, therapists high in anxiety sensitivity may be likely to engage in a variety of counter-therapeutic strategies during ET in order to decrease their own and/or their client's anxiety (e.g., encouraging clients to avoid or use coping skills during exposure, reassuring clients that they are safe, terminating exposure tasks prematurely). Future research would benefit from evaluating whether therapists with higher general anxiety are also less proficient in delivering ET, or whether this relationship is specific to therapists who fear anxiety-related sensations. In addition, therapists with more negative attitudes toward ET at post-training demonstrated less proficiency in delivering ET, a finding consistent with prior research (e.g., Baer et al., 2009; Nelson & Steele, 2007). This highlights the importance of addressing therapist attitudes during training itself, as therapists who continue to view a treatment negatively after training may be less likely to invest the time or effort necessary to implement it well. The motivational enhancement intervention in the present study served this function and appears to be an effective method for improving therapist attitudes toward ET (Harned et al, under review). Therapist knowledge of ET at post-training was the strongest predictor of clinical proficiency, and this facilitating effect was particularly pronounced for highly knowledgeable therapists in the OLT + ME + LC condition. This suggests that therapists who clearly understand the rationale and procedures of ET are typically able to translate this knowledge into proficient clinical application, particularly when they have the opportunity to participate in a learning community in which key treatment procedures are discussed and practiced.

It is also important to highlight which hypothesized variables were not significantly associated with adoption of ET. Most notably, organizational and client characteristics were not associated with clinical use and were minimally associated with clinical proficiency. The lack of significant effects for client factors predicting adoption is noteworthy, especially given therapist beliefs that clients are often unwilling to engage in ET (e.g., APA Division 12, 2010). In contrast to these beliefs, client resistance to ET was not significantly associated with clinical use or proficiency in any model. More generally, these findings suggest that the primary barriers to the adoption of ET are therapist, not client or organizational, factors. It is also interesting to note that therapist self-efficacy predicted clinical use, but not clinical proficiency. As in studies of training methods for other EBPs (e.g., Miller & Mount, 2001), this suggests that therapists may not be accurate judges of their ability to deliver ET. Finally, therapist theoretical orientation and years of clinical experience were unrelated to adoption, suggesting that training in ET can be effective for therapists from a wide range of practice backgrounds.

The present study has several limitations. First, all therapists volunteered to receive the training in this study and were therefore likely to be particularly motivated to learn and use ET. The self-selected nature of the sample may have led to higher rates of adoption than would be found in other types of therapist samples (e.g., therapists mandated to learn ET). Second, the present study relied on therapist self-report to assess use of ET in clinical practice, which may not accurately reflect actual behavior (e.g., Miller, Yahne, Moyers, Martinez, & Pirritano, 2004). Future research would benefit from the inclusion of more objective measures of clinical use (e.g., chart review, session recordings). Third, relatively few potential client barriers to adoption of ET were assessed and these barriers were rated by therapists. Future research would benefit from examining a wider range of client characteristics (e.g., type and severity of diagnoses) and obtaining ratings directly from clients (e.g., of client resistance to ET). Finally, adoption was measured over a relatively short follow-up period (12 weeks) and research on predictors of longer-term adoption is also needed.

In summary, the dissemination and implementation of ET into clinical practice is a challenging process. Increasing the number of therapists trained to deliver this efficacious treatment is a necessary first step, but training is only successful if it leads to adoption. Multiple organizational, client, and therapist variables are likely to impact whether and how proficiently therapists use ET following training. Of these, therapist characteristics appear to be most likely to predict both clinical use and proficiency in ET following training, suggesting that intervening at the level of the therapist may be the most effective way to increase adoption of ET. In particular, therapists with greater knowledge, self-efficacy, and positive attitudes toward ET after training are more likely to subsequently adopt the treatment. Thus, effective training in ET must include components designed to address these multiple therapist factors. In the present study, training that included a combination of didactic teaching, attitudinal intervention, and a learning community focused on active practice and consultation was particularly effective in reducing the impact of barriers and enhancing the effects of facilitators of adoption.

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Highlights

1. We examine predictors of adoption of exposure therapy (ET) 12 weeks after training.
2. Therapist academic degree, self-efficacy, and knowledge predict use of ET.
3. Organizational barriers and having anxious clients predict proficiency in ET.
4. Therapist anxiety sensitivity, attitudes, and knowledge predict proficiency in ET.
5. Several predictor effects varied depending on the type of training received.

Figure 1.

Plots of significant interactions between predictors and training condition in predicting clinical use of ET. For plotting purposes, continuous predictors were recoded as low (> 1 SD below the mean), average (± 1 SD from the mean), or high (> 1 SD above the mean).

Figure 2.

Plots of significant interactions between predictors and training condition in predicting clinical proficiency in ET. For plotting purposes, continuous predictors were recoded as low (> 1 SD below the mean), average (± 1 SD from the mean), or high (> 1 SD above the mean).

Table 1

Sample Characteristics

Characteristics	Intent-to-Train Sample (N=181)
<i>Age M (SD)</i>	37.42 (10.31)
<i>Gender</i>	
Female	71.3%
Male	28.7%
<i>Ethnicity</i>	
Caucasian	72.1%
African American	8.4%
Asian American	4.5%
Hispanic/Latino	6.1%
Multiracial	8.9%
<i>Education</i>	
BA/BS/RN	11.8%
MA/MS	67.1%
Psy.D./Ph.D./M.D./ABD	21.1%
<i>Profession</i>	
Psychiatrist	3.5%
Psychologist	14.0%
Psychiatric nurse	1.8%
Social worker	27.5%
Master's level counselor	28.7%
Bachelor's level counselor	1.8%
Student	22.8%
<i>Work Setting</i>	
Private practice	21.1%
Outpatient CMHC	41.1%
Day/residential treatment	7.2%
Inpatient Treatment	4.4%
Corrections facility/legal system	2.2%
Medical center	6.1%
School/University	6.7%
Other	11.1%
<i>Experience M (SD)</i>	
Years worked as a provider since degree	4.76 (5.68)
<i>Theoretical Orientation</i>	
Cognitive and/or behavioral	56.1%
Client-centered/Humanistic	17.2%
Psychodynamic/analytic	6.7%
Systems	1.7%
Interpersonal	4.4%

Characteristics	Intent-to-Train Sample (N=181)
Twelve Step model	1.1%
Existential	1.1%
Other	11.7%

Note. ABD = all but dissertation. CMHC = community mental health center.

Table 2**Organizational and Client Barriers to Learning and Using Exposure Therapy**

	M	SD
<i>Organizational Barriers</i>		
No relief time from work is provided for learning and implementing ET.	2.30	1.05
No regular clinical supervision is available to support the skills I learned in the training.	2.65	1.14
No formal commitment from my organization to learning and implementing ET.	2.18	1.15
Lack of reimbursement or incentives for using ET with my clients.	1.36	0.76
Administration/agency is not supportive of using ET.	1.44	0.75
Aspects of ET are controversial and/or viewed negatively in my organization.	1.23	0.56
Unable to leave the clinic/office with clients to do exposure tasks in other settings.	2.46	1.18
Unable to conduct therapy sessions lasting longer than one hour.	2.40	1.14
<i>Client Barriers</i>		
I have too many clients to think about applying a new therapeutic method.	1.51	0.79
Clients are accustomed to the treatment they have had, and are resistant to change.	1.73	0.89
I am currently not working with anxiety disorder clients.	1.37	0.76

Note. Data are from barriers identified at the post-training assessment. Items were rated from 1 (No impact) to 4 (Significant impact). Valid data ranged from n=141–144 across items. ET = exposure therapy.

Table 3**Self-Reported Clinical Use of Exposure Therapy Procedures Twelve Weeks After Training**

In the past 6 weeks, how many times did you...	M	SD
Orient your client(s) to the rationale for exposure therapy	3.38	5.56
Orient your client(s) to the procedures of exposure therapy	3.64	9.14
Create an exposure hierarchy	1.86	4.45
Conduct an interoceptive exposure task	0.89	2.03
Conduct an in vivo exposure task	2.15	4.63
Conduct an imaginal exposure task	2.99	8.41
Debrief after an exposure task	4.42	6.32
Assign exposure homework	4.39	6.71
Discuss relapse prevention strategies	1.75	4.58
Total use (all procedures combined)	25.46	37.00

Note. Means and standard deviations are from raw data. N=136 with valid data.

Table 4

Generalized Linear Models Predicting Clinical Use of Exposure Therapy

Predictors	Wald χ^2 Tests of Type III Model Effects		Overall Model Test	
	Predictor	Condition	Predictor X Condition	Likelihood ratio χ^2 (5) <i>p</i>
<i>Organizational Characteristics</i>				
Organizational barriers	2.81	2.33	0.46	5.90 .32
Clinical setting	6.78*	1.49	2.70	13.41 .10
<i>Client Characteristics</i>				
Too many clients	3.48	2.69	0.53	6.42 .27
Clients resistant to change	1.15	2.39	0.32	3.93 .56
No anxiety disorder clients	5.34*	2.90	0.63	7.99 .16
<i>Therapist Characteristics</i>				
Academic degree	12.96**	9.38**	11.71*	17.19 .03
Theoretical orientation	1.66	1.84	0.58	4.53 .48
Clinical experience	0.51	2.11	0.71	3.66 .60
Anxiety sensitivity	0.95	2.15	0.15	4.64 .46
Attitudes toward ET	4.84*	2.39	0.04	7.74 .17
Knowledge	5.66*	3.81	1.71	11.64 .04
Self-efficacy	4.33*	0.68	11.71**	19.00 .002

Note. Each row is from a separate GLM. Predictor = main effect of the predictor in that row. Condition = main effect of training condition.

* $p < .05$

** $p < .01$

Table 5

Generalized Linear Models Predicting Clinical Proficiency in Exposure Therapy

Predictors	Wald χ^2 Tests of Type III Model Effects		Overall Model Test	
	Predictor	Condition	Predictor X Condition	Likelihood ratio χ^2 (5) <i>p</i>
<i>Organizational Characteristics</i>				
Organizational barriers	5.30*	8.58*	1.31	14.29 .02
Clinical setting	2.21	3.23	3.68	12.70 .12
<i>Client Characteristics</i>				
Too many clients	3.55	8.51*	2.40	13.25 .02
Clients resistant to change	3.68	7.21*	4.07	15.00 .01
No anxiety disorder clients	0.01	7.26*	5.94*	14.48 .01
<i>Therapist Characteristics</i>				
Academic degree	2.33	4.01	0.22	8.10 .42
Theoretical orientation	0.06	3.95	0.42	4.54 .47
Clinical experience	0.57	8.64*	0.54	11.39 .04
Anxiety sensitivity	6.34*	10.90**	5.44	22.65 <.001
Attitudes toward ET	4.35*	6.99*	0.05	13.17 .02
Knowledge	70.71***	4.75	9.53**	69.65 <.001
Self-efficacy	0.65	8.14*	3.69	12.86 .02

Note. Each row is from a separate GLM. Predictor = main effect of the predictor in that row. Condition = main effect of training condition.

* $p < .05$

** $p < .01$

*** $p < .001$