Effects of Workshop Trainings on Evidence-Based Practice Knowledge and Attitudes among Youth Community Mental Health Providers

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Abstract

Enhancing the public health impact of evidence-based practices (EBPs) in usual care settings is a key priority of the National Institute of Mental Health. Longitudinal data from community mental health providers (N = 268) participating in a series of state-sponsored workshops in modular approaches to EBPs for youth are presented. EBP workshop attendance for youth anxiety resulted in increased knowledge for EBPs for anxiety (and not other conditions) and EBP workshop attendance for youth disruptive behaviors resulted in increased knowledge for EBPs for disruptive behaviors (and not other conditions). Providers’ tendencies towards incorrectly classifying non-EBP therapies as evidence-based increased over time, suggesting that providers over-generalize the EBP label as a result of attending these types of workshops. Regarding EBP attitudes, most measures of attitudes improved when providers attended a workshop. Additionally, an overly inclusive view of what constitutes an EBP at intake was related to significant decreases in openness to trying EBPs over time, whereas more positive attitudes at intake was related to achieving a more refined view of what constitutes an EBP over the course of attending trainings. Study limitations and implications for implementation of EBPs in usual care settings are discussed.

Keywords: dissemination; implementation; evidence-based practices; training; knowledge; attitudes
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Within the last three decades, significant progress has been made in identifying efficacious psychosocial interventions for treating youth psychopathology (Lonigan, Elbert, & Johnson, 1998; Silverman & Hinshaw, 2008; Society of Clinical Child and Adolescent Psychology & Association for Behavioral and Cognitive Therapies, 2009; Weisz, Hawley, & Doss, 2004). Results across all major childhood problem areas strongly suggest that some treatments outperform others, and there is a growing consensus that a next big step in the broader mental health services movement is to focus on the implementation of such practices in community settings (Institute of Medicine, 2001; New Freedom Commission on Mental Health, 2003; U.S. Public Health Service, 2000). Accordingly, conceptual and empirical issues related to effective implementation are becoming increasingly examined and explored (e.g., Beidas & Kendall, 2010; Damschroder et al., 2009).

Potential EBP Implementation and Training Innovations

One issue that has recently received increased attention is that of provider training in evidence-based practices (EBPs). Research in this area suggests a large discrepancy between training-as-usual practices and empirically-based training recommendations. For example, the near-universal pattern for continuing education involves attending a brief didactic presentation with little to no follow-up or organizational support (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005; Institute of Medicine, 2010). On the contrary, empirically-based recommendations call for many hours of multi-modal learning experiences over extended time periods with heavy organizational support (Beidas & Kendall, 2010; Herschell, Kolko, Baumann, & Davis, 2010; Rakovshik & McManus, 2010). As such, large community implementation efforts may benefit from adaptation processes both at the level of EBP identification as well as the training process itself. As highlighted in numerous implementation theories, careful adaption to a local environment appears to be a key component of the overall implementation process (cf.
Damschroeder et al., 2009; Fixsen et al., 2005; Rogers, 2003). With regard to EBP identification, work by Chorpita and colleagues (Chorpita, Daleiden, & Weisz, 2005; Chorpita, Becker, & Daleiden, 2007; Chorpita & Daleiden, 2009) has moved away from classification schemes emphasizing brand named protocols to organizing treatments based on their component practice elements. A practice element (or common element) can be defined as a discrete clinical technique or strategy (e.g., exposure) used as part of a larger intervention protocol (Chorpita et al., 2005; Chorpita et al., 2007; Chorpita & Daleiden, 2009). For example, within the youth treatment outcome literature for anxious problems, most evidence-based protocols utilize the practice elements of exposure and cognitive restructuring (Chorpita & Daleiden, 2009). When such discrete techniques are flexibly arranged and guided by a clinical decision-making algorithm for providing youth therapy, the treatment approach is said to be modular in nature (Chorpita & Weisz, 2009). Empirical investigations into both the practice element approach for understanding the youth treatment literature and modular application of discrete techniques for treatment purposes have been steadily growing (Chorpita & Daleiden, 2009; Weisz et al., 2011).

A second potentially fruitful implementation concept is to begin adapting empirically based-training processes to better fit large community mental health settings. The likely reality is that public sector systems cannot afford such intensive training regimens in their entirety for all of their therapists. One possible idea for beginning this adaptation process is to create a triaged system of training, based upon target individual baseline characteristics. For instance, research into provider-level characteristics such as knowledge of and attitudes towards EBPs has slowly been growing over the years, and suggests that these constructs play important roles in product adoption and sustainability (Damschroeder et al., 2009; Fixsen et al., 2005). Concerning EBP attitudes, numerous studies have documented providers’ concerns that manualized treatments do not allow for flexibility and individualizing interventions for complex everyday patients (Addis & Krasnow, 2000; Addis, Wade, & Hatgis, 1999; Baumann, Kolko, Collins, & Herschell, 2006; Nelson & Steele, 2008; Nelson, Steele, & Mize, 2006; Walrath, Sheehan,
Holden, Hernandez, & Blau, 2006). Recent research progress in this area includes standardized instrument development for both standard manualized (Aarons, 2004; Aarons et al., 2010) and modular treatment approaches to EBPs (Borntrager, Chorpita, Higa-McMillan, Weisz, & the Network on Youth Mental Health, 2009). EBP knowledge research is newer, but many researchers have suggested that knowledge is often the biggest barrier to EBP implementation (Dearing, 2009; Higa & Chorpita, 2007; Sanders, Prinz, & Shapiro, 2009; Seng, Prinz, & Sanders, 2006). In fact, Chorpita and Regan (2009) have even commented that the term “dissemination” can itself be defined as the delivery of knowledge and the management of attitudes and intentions for providers. Standardized instrument development in this area is lacking, however, Stumpf, Higa-McMillan, and Chorpita (2009) have recently developed a youth EBP questionnaire (Knowledge of Evidence Based Services Questionnaire; KEBSQ) within the practice element paradigm discussed above that is receiving increased empirical attention (e.g., Nakamura, Higa-McMillan, Okamura, & Shimabukuro, 2011; Weist et al., 2009).

Continuing the description of a hypothetical triaged training system, brief initial trainings could focus specifically on positively influencing EBP knowledge and attitudes among providers performing poorly in those areas. Once having improved their knowledge and attitudes, therapists would then participate in more intensive and empirically-supported learning experiences (i.e., role-play, practice cases, etc.) in order to move towards more important competence and performance goals in real-life settings (Miller, 1990). Interestingly, this hypothetical approach is consistent with Beidas and Kendall’s (2010) training review which suggests that didactic presentation, lectures, and other training-as-usual strategies can positively influence providers’ EBP knowledge and attitudes (but not actual behaviors). This is only a cursory example, but highlights the importance of the field’s need to develop training systems that balance empirically-supported training recommendations, public sector resources, and current training-as-usual efforts. In other words, on the one hand, training efforts should ultimately focus on therapist competence and performance in real-life scenarios (Miller, 1990) through using
tested training techniques. At the same time, it seems a worthwhile preliminary endeavor to increase our scientific understanding of how competence and performance precursors (e.g., knowledge and attitudes) change over time, especially in response to existing training-as-usual efforts.

Present Investigation

The present investigation follows up on Nakamura et al.’s (2011) study that examined the relationships between practitioner background variables and knowledge of and attitudes towards EBPs among youth practitioners. In their initial cross-sectional study, Nakamura et al. (2011) examined therapists’ attitudes and knowledge just prior to participating in a series of EBP workshops. Overall, they found that very few provider variables predicted EBP knowledge and attitudes. Also, with regard to the relationship between knowledge and attitudes prior to training, an overly restrictive view for defining EBP techniques (as defined by KEBSQ omission errors; i.e., failing to correctly classify a technique as evidence-based when it actually was) was associated with less favorable EBP attitudes. This investigation builds upon that initial study by longitudinally tracking knowledge and attitudes of Nakamura et al.’s (2011) initial sample of public sector providers as they progressed through a series of state-sponsored workshops emphasizing a modular approach to treatment. This is the first study to examine for such effects using this approach to treatment where training was conducted by full time public-sector training staff. This current investigation also capitalized on the latest instrumentation advances in areas of youth EBP knowledge and attitudes, and did not rely on ideographically created study-specific questionnaires. There were three major foci in the current study, all examined to further scientific understanding of how EBP knowledge and attitudes might change over time in response to a large public sector training effort. First, we examined changes in youth providers’ EBP knowledge over time as they progressed through several types of trainings. We hypothesized unique increases in knowledge as a function of training participation and type of training attended. Specifically, we predicted differential increases in provider knowledge for a small set of anxiety-based techniques only after providers
attended trainings emphasizing those particular techniques; and similar differential increases in provider knowledge for a small set of disruptive behavior-based techniques only after providers attended trainings emphasizing those particular techniques (Beidas & Kendall, 2010). Second, we examined changes in youth providers’ EBP attitudes over time. Given that providers have reported different attitudes towards EBPs depending on whether or not manuals were specifically queried (Borntrager et al., 2009; Brookman-Frazee, Garland, Taylor, & Zoffness, 2009), two measures of attitudes were included in this study: one measure that has been well-established in the literature but refers to manuals (i.e., Aarons, 2004) and another measure does not refer to treatment manuals when assessing attitudes towards EBPs (Borntrager et al., 2009). We predicted positive attitudinal changes as providers progressed through trainings (Beidas & Kendall, 2010). The third area of interest for the present study concerned potential between-provider longitudinal changes in knowledge and attitudes as a function of intake knowledge and attitude scores. Given the suggested link between EBP knowledge and attitudes (Damschroder et al., 2009; Nakamura et al., 2011; Rogers, 2003), we broadly hypothesized that provider intake EBP knowledge levels would predict attitudinal changes over time (and/or vice versa).

Method

Participants

As mentioned, the current investigation followed up on Nakamura et al.’s (2011) cross-sectional study that examined youth providers’ demographic variables and knowledge of and attitudes towards EBPs prior to training workshops. Sample characteristics for the current study, however, differed slightly from those of Nakamura et al. (2011; N = 240) since the current study’s design and analytic approach did not focus solely on providers’ pre-training characteristics. In this study, a total of 268 (63.2% participation rate from a larger pool of 424 potential participants) public sector youth mental health providers participated (see Analytic Strategy below). These providers all progressed through one or more state sponsored EBP workshops for youth internalizing and externalizing problems. Providers
ranged in age from 22 to 72 (M = 39.2, SD = 11.3), 73.5% were female (n = 197), and the primary ethnicities reported were: White (n = 114; 42.5%), Asian (n = 52; 19.4%), Hawaiian or Pacific Islander (n = 23; 8.6%), Black (n = 6; 2.2%), Latino (n = 5; 1.9%), and Other (n = 3; 1.1%). Sixty five participants (24.2%) did not report a primary ethnicity. As seen in Table 1, most participants held a masters-level degree, and came from varying professional disciplines and theoretical orientations. Participants reported an average of 5.3 years of clinical training (SD = 6.3), 6.3 years of clinical experience beyond their undergraduate degree (SD = 6.7), and 25.7% (n = 69) reported holding a state license to practice.

Participants came from 19 different mental health agencies, and as indicated in Table 1, worked in a variety of clinical settings. On average, participants reported having an active caseload of 10.3 (SD = 8.9) and received approximately 1.7 hours of supervision per week (SD = 1.8).

**Measures**

*Knowledge of Evidence Based Services Questionnaire* (KEBSQ; Stumpf et al., 2009). The KEBSQ is a 40-item measure assessing awareness knowledge of various evidence-based and non-evidence-based techniques for youth with Anxious/Avoidant (A), Depressed/Withdrawn (D), Disruptive Behavior (B), and Attention/Hyperactivity (H) problems. Respondents are asked to circle all problem areas for which a particular type of practice element is considered evidence-based. Each individual item is then scored on a scale from zero to four, with correctly endorsed and omitted responses per problem area each receiving one point. As an example, exposure has been classified as an evidence-based technique for Anxious/Avoidant problems according to Chorpita and Daleiden (2007). In this case, a respondent would get one point for circling A, one point for not circling D, one point for not circling B, and one point for not circling H, for a grand total of four points. Participants also have the option of circling the letter N (None) for each item in order to differentiate a no-response (e.g., the participant refused to answer the question) from indicating that a particular technique is not considered evidence-based for any of the four problem areas. The KEBSQ has demonstrated adequate test-retest reliability in graduate students.
and community providers \((r = .56)\) and the ability to discriminate between these two populations. KEBSQ pre-training scores \((M = 93.7, SD = 9.14)\) for the present study were consistent with Stumpf et al.’s (2009) original findings.

The KEBSQ is a particularly unique and comprehensive way of assessing provider knowledge due to the dynamic structure of its scoring key. For example, when the KEBSQ was originally developed, Stumpf et al. (2009) used the 2004 version of the Child and Adolescent Mental Health Division (CAMHD) Biennial Report to inform the answer key. However, given that all data were collected in the current study at trainings in 2008 and 2009 (well after the 2007 version of the CAMHD Biennial Report was released into Hawaii’s system of care), the scoring key for the KEBSQ in this study was altered to reflect findings from the 2007 CAMHD Biennial Report (Chorpita & Daleiden, 2007).

**Evidence-Based Practice Attitude Scale** (EBPAS; Aarons, 2004; Aarons et al., 2010). The EBPAS is a 15-item well-established measure of provider attitudes towards EBPs. Participants indicate on a four-point Likert-scale \((0 = "not at all" to 4 "to a very great extent") the extent to which they agree with a particular statement. Higher mean scores indicate more favorable attitudes. The EBPAS generates four scales including \(a\) Appeal—appeal of EBPs, \(b\) Requirements—EBP use is required by the provider’s organization, \(c\) Openness—openness to trying EBPs, and \(d\) Divergence—unfavorable attitudes toward EBPs \((\text{reverse scored})\). Aarons (2004) found evidence for the measure’s factor structure and good internal consistency for these scales, with Cronbach’s alphas ranging from .77 for the total to .90 for the requirements subscale. Cronbach alpha coefficients for all EBPAS scale scores in the current study were consistent with those reported by Aarons’ (2004) and Aarons et al. (2010); appeal \((\alpha = .79)\), requirements \((\alpha = .95)\), openness \((\alpha = .82)\), divergence \((\alpha = .68)\), and total \((\alpha = .81)\). EBPAS mean and standard deviation indices for the current sample were slightly higher \((\text{lower for the divergence scale})\) than those reported by Aarons (2004) and Aarons et al. (2010); appeal \((M = 3.11, SD = 0.69)\),
requirements ($M = 2.84, SD = 0.95$), openness ($M = 3.00, SD = 0.67$), divergence ($M = 1.06, SD = 0.67$), and total ($M = 2.98, SD = 0.48$).

*Modified Practice Attitude Scale* (MPAS; Borntrager et al., 2009). The MPAS is an eight item self-report measure of provider attitudes towards EBP. The MPAS was included in addition to the EBPAS, given that provider attitudes towards EBPs have been shown to differ based on whether or not the term manual is mentioned when assessing for attitudes (Borntrager et al., 2009). Similar to the EBPAS, participants indicate on a four-point Likert-scale the extent to which they agree with a particular statement. The MPAS has evidenced good internal consistency ($\alpha = .80$) and a moderate correlation with the EBPAS ($r = .36, p < .01$). Cronbach alpha coefficient, mean, and standard deviation data for the current sample were consistent with those reported by Borntrager et al. (2009); $\alpha = .74, M = 21.9, SD = 4.41$.

*Procedure*

Questionnaire data were collected from participants as they progressed through three types of state-sponsored trainings (described in greater detail below): (a) Introduction to Hawaii’s Public Sector Mental Health System (INTRO), (b) Core Practice Elements for Trauma and Anxiety (ANX), and (c) Core Practice Elements for Disruptive Behaviors (DBD). Each type of training was viewed as a discrete component, used as part of a larger training protocol. Although participants were urged to complete the INTRO training prior to either the ANX or DBD trainings (which could be taken in any order thereafter), some providers attended the INTRO training after an ANX and/or DBD training or did not attend the INTRO training at all due to scheduling or other difficulties. Each training event was co-lead by two expert trainers and limited to no more than 30 participants.

Trainings were voluntary in nature and were offered across the state of Hawaii’s four counties between May 2008 and July 2009 (i.e., a total of 12 INTRO, six ANX, and five DBD trainings intermittently staggered throughout the 15-month study period). All providers underwent standardized Institutional
Review Board-approved notice of privacy and consent procedures before any aspect of participation in this study. These workshops represented standard continuing education opportunities offered by five expert trainers. Expert trainers were full time public sector employees within CAMHD’s Practice Development Office. This office is charged with numerous best practice initiatives for the entire CAMHD system of care, such as providing standards of practice guidelines, procuring and overseeing the implementation of evidence-based “package programs” (e.g., Multisystemic Therapy; MST, Henggeler & Borduin, 1990), and providing training to front-line providers in evidence-based approaches. Two expert trainers were Ph.D.-level clinical psychologists and three had their master’s degrees in psychology or a related mental health services field.

The INTRO training served as a broad level orientation to the youth public sector mental health service system in Hawaii, focusing on topics such as navigating and working within its system of care, its own unique version of the Child and Adolescent Service System Program (CASSP) principles, the role of assessment in quality care, and an introduction to the practice element approach for conceptualizing EBPs and other innovative best practice efforts developed in Hawaii (Chorpita et al., 2002). Both the ANX and DBD trainings focused on several technique commonalities across numerous evidence-based protocols (rather than any brand-named treatment manual), as well as the modular assembly of those techniques for designing a larger coherent treatment approach. Techniques taught in the ANX training included self-monitoring, psychoeducation for youth, exposure, relaxation, and cognitive/coping. DBD trainings emphasized psychoeducation for caregivers, commands, tangible rewards, response-cost, praise, monitoring, and attending. Trainers provided an underlying theory and rationale for technique usage, relevant printed materials and handouts, and step-by-step procedural guidelines for technique application. Information was conveyed via didactic presentation, video, and modeling and role play. Training materials for INTRO, ANX, and DBD trainings were adapted from several Practitioner Guide
protocols (PracticeWise, 2008). All procedures were highly codified to promote consistency within and across trainings and to help protect against training drift.

Questionnaire administration varied slightly as a function of workshop type. Prior to all types of trainings, the full battery consisting of the EBPAS (Aarons, 2004), KEBSQ (Stumpf et al., 2009), MPAS (Borntrager et al., 2009), and TBQ were administered to participants. The EBPAS, MPAS, and KEBSQ were administered after each of the ANX and DBD trainings. Unlike the ANX and DBD trainings, no study questionnaires were administered after the INTRO trainings due to time constraints and the need for trainers to administer non-study related questionnaires. However, given that all knowledge and attitude questionnaires were administered prior to and after both ANX and DBD trainings, training attendance data were coded in a way that allowed for examination of knowledge and attitudinal shifts after attending an INTRO workshop (see Analytic Strategy below).

Data Preparation

Questionnaires were retained if no more than 20% of their overall items were missing (cf. Ebesutani, Bernstein, Nakamura, Chorpita, & Weisz, 2010). At an instrument case level, this resulted in 489 EBPAS, 446 KEBSQ, and 495 MPAS questionnaires for the 268 participants. Of these 268 providers, 128 contributed to one measurement occasion, 77 to two measurement occasions, 40 to three measurement occasions, nine to four measurement occasions, 13 to five measurement occasions, and one contributed to six measurement occasions. Missing data were handled using the Missing Value Analysis (MVA module of SPSS 18.0; SPSS, 2009) which examined missing data patterns using Little’s Missing Completely at Random (MCAR) test (Little & Rubin, 1987) and then imputing for continuous MCAR variables through maximum likelihood. Since Little’s MCAR tests were non-significant for the EBPAS ($\chi^2 = 127.3, df = 163, p = .98$), MPAS ($\chi^2 = 38.0, df = 49, p = .87$), and KEBSQ items ($\chi^2 = 2843.2, df = 2735, p = .073$), the data was imputed accordingly.

Analytic Strategy
Data was analyzed using hierarchical linear modeling (HLM6 software; Raudenbush, Bryk, Cheong, & Congdon, 2004). Given the varying number of measurement occasions and different patterns of workshop attendance order across providers, HLM was chosen because it allows for examination of changes over time both within and between providers. Two-level HLM models were constructed to measure the impact of workshop attendance on changes in knowledge and attitudes employing a random intercepts model.

In the first model we analyzed within-providers changes as a function of training attendance. Here workshop attendance was dichotomously coded to allow for shifts in elevation of knowledge and attitude scores following each workshop attendance (see Singer & Willett, 2003). In this model, specific workshop variables were coded as zero prior to attendance and then one thereafter for post-training occasions. Thus the coefficient for each workshop variable allows an investigator to infer the specific effects\(^1\) of each workshop type on knowledge and attitude scores. In specifying the model, we coded for the time variable \((P_{1i})\) as an ordinal measure corresponding to measurement occasion (e.g. 1, 2, 3, etc.). To examine change across all participants, no Level 2 predictors were included in this first model.

\[
\text{Level 1: } \text{Outcome}_{i} = P_{0i} + P_{1i}(\text{time}) + P_{2i}(\text{INTRO exp.}) + P_{3i}(\text{ANX exp.}) + P_{4i}(\text{DBD exp.}) + \epsilon_{i}
\]

In order to address our first hypothesis that specific types of EBP knowledge would differentially increase as a function of participating in certain types of training, a total of four types of EBP knowledge outcome scores were repeatedly assessed over time. First, KEBSQ ANX Target scores were created in order to examine participants’ EBP awareness knowledge for the five techniques covered during ANX trainings. Calculating this score involved examining the extent to which participants correctly circled A

\(^{1}\) It is worth noting that there are currently no widely used conventions for computing effect sizes in HLM.
(for Anxious/Avoidant problems) on the KEBSQ for the five trained techniques. Participants received one point for each of these five correct technique/problem area intersections, hence KEBSQ ANX Target scores ranged from zero to five. Second, KEBSQ DBD Target scores were calculated in a similar fashion. Participants received one point for each of the seven correct technique/problem area intersections, and KEBSQ DBD Target scores could therefore range from zero to seven.

The third and fourth types of knowledge scores computed were overall KEBSQ Commission Error and KEBSQ Omission Error scores (cf. Nakamura et al., 2011). These scores were calculated in order to take a preliminary look into the specificity of KEBSQ ANX and DBD Target score changes. Errors of commission refer to instances in which subcomponent true-false responses are incorrectly indicated as evidence-based by a participant when they actually are not (i.e., suggestive of a tendency towards EBP over-identification and an overly inclusive view of what constitutes an EBP). Errors of omission on the other hand refer to incorrectly indicating that practices are not evidence-based when they actually are (i.e., suggestive of a tendency towards EBP under-identification and an overly restrictive view of what constitutes and EBP). KEBSQ Commission Error and KEBSQ Omission Error scores could range from 0-88 and 0-72 points, respectively.

Three specific hypotheses were formulated for this study. Our first hypothesis predicted that differential performance should be observed for the four EBP knowledge outcome scores over time. Since the INTRO training did not cover any specific practice elements, no changes in KEBSQ ANX Target, KEBSQ DBD Target, Commission Error, or Omission Error scores were predicted as a function of attending this type of training. For the ANX training, it was predicted that only KEBSQ ANX Target scores (and not KEBSQ DBD Target, Commission Error, or Omission Error scores) would significantly increase as a function of attending this type of training. For the DBD training, it was similarly predicted that only KEBSQ DBD Target scores would significantly increase as a function of attending this type of training.
(range = 0-160) across the three types of trainings, these scores were also examined in a longitudinal exploratory manner.

Our second hypothesis predicted positive attitude changes as providers progressed through trainings, and was investigated using six attitude indices over time. These included the EBPAS’ (Aarons, 2004) scale (Appeal, Requirements, Openness, and Divergence) and Total score averages (range = 0-4) as well as the MPAS’ (Borntrager et al., 2009) total score (range = 0-32). We specifically predicted increases in MPAS total and EBPAS Appeal, Openness, and Total scale scores over time; decreases in EBPAS Divergence scale scores; and maintenance of EBPAS Requirements scale scores (i.e., because this scale reflects the extent to which a provider’s organization requires EBP usage, rather than individual attitudes) across all trainings. Given the broad attitudinal focus of these scale and total scores (as opposed to a narrow focus centered on attitudes for specific techniques), as well as the exploratory nature of these analyses, we did not make a priori predictions for attitude changes varying differentially across the three types of trainings.

Our third and final area of inquiry examined between-provider longitudinal changes in knowledge and attitudes as a function of intake knowledge and attitude scores. Towards this end, a second model was specified which further expanded on our first model by introducing time-invariant Level 2 predictors. Such a model allowed us to explore the effects of intake knowledge and attitudes on Level 1 knowledge and attitude rates of change above and beyond the effects of workshop trainings². Given the suggested link between EBP knowledge and attitudes (Damschroeder et al., 2009; Rogers, 2003), two separate clusters of Level 2 predictor analyses were examined. First, we investigated if one

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² Given that the present investigation longitudinally followed up on Nakamura et al.’s (2011) cross-sectional initial study (which examined the relationships between practitioner background demographic variables and knowledge of and attitudes towards EBPs prior to participating in training workshops), we were most interested in novel HLM Level 2 predictor findings on score slopes, as intercept results (outside of KEBSQ ANX and DBD Target scores ideographically used in this study) would overlap with those of Nakamura et al.’s (2011) pre-workshop correlation results.
or more EBP knowledge scores (KEBSQ ANX Target, DBD Target, Commission Error, and Omission Error) would predict rates of change on one or more EBP attitude indices (EBPAS scale and total and MPAS total scores). Second, we also examined whether initial EBP attitudes predicted EBP knowledge rates of change (slope). Given the nascent nature of the literature on youth EBP knowledge-attitude relationships, our third hypothesis broadly speculated that since these constructs are likely related to one another, prediction of one given the other (knowledge and attitude) is quite possible.

\[ \text{Level 2: } P_{0i} = \beta_{00} + \beta_{01} (\text{Level 2 predictor}) + \varepsilon_i \]

\[ \text{Level 2: } P_{1i} = \beta_{10} + \beta_{11} (\text{Level 2 predictor}) + \varepsilon_i \]

Results

Longitudinal Knowledge Changes

Table 2 shows the results of fitted HLM models for all knowledge indices: KEBSQ ANX Target, DBD Target, Commission Error, Omission Error, and Total scores. Consistent with our first hypothesis, there were no significant changes in any of the KEBSQ knowledge scores after attending the INTRO training. Additionally, although no overall significant rates of change over time (i.e. slope parameter) were seen on any knowledge outcome score across the entire sample, specific changes in knowledge scores were indeed observed after attendance to specific workshops. Consistent with our first hypothesis that a highly targeted training approach would lead to particular increases in EBP knowledge, KEBSQ Target scores for both ANX and DBD problem areas saw respective increases.

Concerning the unique effects associated with ANX trainings, providers’ KEBSQ ANX Target score (range = 0-5) significantly increased by 1.09 points on average after attending the ANX workshop. Also consistent with our predictions for the specific effects of the ANX trainings, KEBSQ DBD Target scores did not change significantly as a result of attending this type of training. Contrary to our hypothesis,
however, overall KEBSQ Commission Errors (circling when one should not; range = 0-88) increased significantly ($P_3 = 6.96, SE = 3.09, p < .05$) suggesting a general trend for over-circling KEBSQ items, as a function of attending this type of training. Consistent with this Commission Error result, KEBSQ Total scores (range = 1-160) also decreased by 4.73 points after attending an ANX training$^3$.

As predicted, KEBSQ DBD Target scores (range = 0-7) increased significantly by 0.78 on average after attending a DBD workshop, whereas KEBSQ ANX Target scores did not change significantly. However, overall KEBSQ Commission Errors increased significantly ($P_4 = 7.21, SE = 3.48, p < .05$), again pointing to a general trend for over-circling KEBSQ items after attending a technique-centric training. Lastly, aligning with this Commission Error finding, KEBSQ Total scores decreased by 4.29 as a result of attending a DBD training.

*Longitudinal Attitudinal Changes*

Analyses into differential attitudinal changes over time partially supported predictions associated with our second hypothesis. As shown in Table 3, MPAS total scores (range = 0-32) increased by 2.02 points after ANX trainings ($SE = 0.69, p < .01$), and by 1.61 points after attending DBD trainings ($SE = 0.80, p < .05$). Also consistent with our predictions for positive attitude changes following trainings, EBPAS Appeal scale (range = 0-4) scores increased by 0.19 points ($SE = 0.09, p < .05$) and EBPAS Total (range = 0-4) scores increased by 0.15 points ($SE = 0.06, p < .05$) after attending INTRO trainings. Additionally, EBPAS Openness scale (range = 0-4) scores increased by 0.20 points after attending INTRO trainings ($SE = 0.09, p < .05$), 0.41 points after attending ANX trainings ($SE = 0.09, p < .001$), and 0.36 points after DBD trainings ($SE = 0.10, p < .01$). EBPAS Requirement scales scores did not change significantly as a function of attending any type of training. Contrary to expectation, EBPAS Divergence

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$^3$ It is worth noting here that the possibility that these over circling errors could have accounted for the increases in DBD and INT targeted scores is unlikely, as an exploratory model which included KEBSQ Commission and Omission errors as predictors still yielded similar significant effects (coefficients) of the workshop trainings.
scale scores did not decrease after participants attended any type of training. Finally, and somewhat surprisingly, EBPAS Openness scale scores were found to decrease slightly by 0.21 points (SE = 0.06, p < .01) solely as a function of time.

Provider Level Predictor Variables

The third and final set of results were drawn from a second statistical model, which introduced intake knowledge and attitude scores as Level 2 grouping predictors. We first examined if EBP knowledge (KEBSQ ANX Target, DBD Target, Commission Error, and Omission Error) scores predicted rates of change on any EBP attitude index (EBPAS scale and total and MPAS total scores). Analyses revealed that initial KEBSQ Commission Error scores significantly predicted the rate of change on EBPAS Openness scale scores ($\beta_{00} = 2.98; \beta_{10} = -0.019; \beta_{11} = -0.002, SE = 0.001, p < .05$), suggesting that an overly inclusive view of what constitutes an EBP is related to significant decreases in youth providers’ openness to trying EBPs over time. Our second cluster of Level 2 analyses involved investigating if any type of EBP attitude score predicted rates of change on any type of EBP knowledge. Results revealed that EBAS Appeal scale scores predicted rates of change on KEBSQ ANX ($\beta_{00} = 2.37; \beta_{10} = 0.56; \beta_{11} = -0.16, SE = 0.08, p < .05$) and DBD Target ($\beta_{00} = 4.50; \beta_{10} = 0.65; \beta_{11} = -0.19, SE = 0.08, p < .05$) scores, indicating that higher initial EBP appeal attitudes were associated with decreases in these types of targeted EBP knowledge scores. Results also indicated that intake EBPAS Appeal scale scores ($\beta_{00} = 27.12; \beta_{10} = 10.11; \beta_{11} = -2.98, SE = 1.18, p < .05$), EBPAS Openness scale scores ($\beta_{00} = 31.73; \beta_{10} = 10.69; \beta_{11} = -3.28, SE = 1.18, p < .01$), and MPAS total scores ($\beta_{00} = 25.18; \beta_{10} = 9.20; \beta_{11} = -0.37, SE = 0.18, p < .05$) significantly predicted the rate of change on KEBSQ Commission Error scores (range = 0 to 88), suggesting that more positive EBP attitudes prior to training is related to decreases in having an overly inclusive view of what constitutes an EBP. No other intake attitude-to-knowledge slope relationships emerged. Overall, our third hypothesis was partially supported and certain aspects of intake EBP knowledge predicted attitudinal changes over time (and/or vice versa).
Discussion

To date, this is the first study to longitudinally examine the effects of public sector workshop trainings emphasizing a modular approach to treatment on EBP knowledge and attitudes among a large sample of youth community mental health providers. Given the competing demands of training many providers with limited public sector resources and empirically-based training recommendations, investigations that focus on effects of sustainable training approaches may prove useful for the larger EBP dissemination and implementation movement. In this study, we investigated targeted knowledge and attitude effects of training workshops stressing a modular approach to EBPs (rather than any one brand named manual). Concerning provider knowledge changes over time, our first hypothesis was partially supported by the finding that general awareness knowledge for a subset of EBP trauma and anxiety techniques increased only after trauma and anxiety trainings, and general awareness knowledge about a subset of EBP disruptive behavior techniques increased only after disruptive behavior trainings. However, across both types of technique-focused trainings, it was also found that knowledge commission errors increased while overall knowledge scores decreased. Collectively, this overall constellation of findings suggest that a targeted approach to training emphasizing technique modularity can result in providers more correctly classifying a particular set of techniques as evidence-based when those techniques are targeted in trainings, but that along with such an approach may come a tendency for providers to over generalize the EBP label, and apply it to techniques that are not evidence-based nor the focus of the targeted training. These results are in line with and also build upon the existing literature in numerous ways. First, consistent with Beidas and Kendall’s (2010) review on provider training efforts for EBPs, this study suggests that brief training dosages can be useful for impacting providers’ EBP knowledge. Second, our finding that providers tend to over-generalize the EBP label and apply it to both EBP and non-EBP strategies in some measure aligns with research on treatment as usual in community mental health settings that suggests that youth providers value and utilize both EBP and
non-EBP strategies (Brookman-Frazee et al., 2009; Higa-McMillan, Powell, Daleiden, & Mueller, 2011). Collectively both lines of research may imply that treatment as usual is characterized by an ethos of over-inclusivity with regard to perceived technique efficacy and technique selection and usage. Another interpretation of these findings is that trainings emphasizing a modular approach to treatment, while effective at enhancing practitioner knowledge of specifically trained techniques, may also run the risk of sending the message that more techniques are evidence-based than truly are. However, this could not be formally tested in the current study. Future studies should use a randomized controlled design with one group receiving training in a modular fashion and another in a more standard manualized method to more fully test whether those trained in a modular fashion produce more commission errors than those who receive standard training.

Concerning EBP attitudinal changes over time, our second hypothesis was partially supported in that exposure to training workshops was associated with several significant and positive increases in providers’ attitudes towards EBPs. EBPAS Openness scale scores increased with exposure to INTRO, as well as technique-based ANX and DBD trainings. MPAS total scores increased only after attending ANX and DBD technique-based trainings and EBPAS Appeal and Total scale scores increased only after attending INTRO trainings. Also aligning with our expectations, EBPAS Requirements scale scores did not change as a result of attending any type of training. Inconsistent with our second hypothesis, EBPAS Divergence scale scores did not change as a function of attending any kind of workshop and EBPAS Openness scale scores were found to slightly deteriorate solely as a function of time. Collectively, these findings suggest that differential aspects of providers’ EBP attitudes selectively change over time as a function of exposure to varying types of workshops. For example, these findings suggest that changes in EBP attitudes not focused on standard treatment manualization may change positively only when trainings focus specifically on teaching discrete technique application and modularity, whereas providers’ overall openness to trying new techniques can be positively influenced after exposure to
these types of trainings as well as introductory principle-driven trainings. Interestingly, a portion of our results replicated those of Borntrager et al. (2009), which also pointed to positive attitudinal changes on the MPAS total (but not the EBPAS total) score in response to an EBP training approach emphasizing modularity. Our studies seem to collectively suggest that MPAS total scores may be more sensitive to attitudinal changes after trainings in modular therapy than EBPAS total scores. However, such a conclusion is only tentative and further study is needed into both the differences and similarities of these instruments to further our overall understanding of them.

With regard to the broader literature on EBP attitudinal change in a more general sense, our results align with Beidas and Kendall’s (2010) review which suggests that brief trainings can be useful for positively influencing providers’ attitudes. Building on the existing literature, however, this study not only employed an innovative training, but also utilized EBP attitude measures supported by growing psychometric data. In regards to the prevalent practice for examining EBP attitude changes, most investigations to date have relied on non-standardized and ideographically created measurement schemes without strong psychometric support (Beidas & Kendall, 2010). It is likely that as EBP attitude instrumentation efforts continue to mature and studies begin to utilize standardized measurement schemes, stronger and more penetrating inquiry and conclusions into this research area will be made. For example, both this and another recent training study on youth EBPs with public sector providers (Lopez, Osterberg, Jensen-Doss, & Rae, 2011) utilized Aarons’ (2004) EBPAS to investigate providers’ attitude changes. However, unlike those of Lopez et al. (2011), our findings point to select and positive changes in EBPAS Appeal, Openness, and Total score changes over time. There are many differences between our study and the work of Lopez et al. (2011), but one major difference that could account for our discrepant findings is in the use of a modular approach versus a brand named standardized manual approach to training. While such a hypothesis is speculative, consistent measurement strategies over time and across studies will help to advance scientific understanding of how to positively impact
providers’ attitudes, as doing so is a fruitful endeavor for the broader EBP dissemination and implementation movement.

Our third and final area of inquiry examined between-provider variables as possible predictors of longitudinal changes over time. Overall, more positive initial EBP attitudes were related to knowledge commission error decreases, suggesting that providers with more favorable pre-training EBP attitudes may be more likely to refine their views of what constitutes an EBP over time. Curiously, initial positive EBP attitudes predicted awareness knowledge decreases for selected anxiety and disruptive behavior techniques. This is a puzzling result, but taken together with the aforementioned finding, may suggest that providers with more positive pre-training EBP attitudes may be more responsive to the effects of training workshops emphasizing modular treatment application. This finding has potential implications for staff selection for training efforts. Some have suggested that staff selection is a key component to effective dissemination and implementation efforts (e.g., Fixsen et al., 2005). With limited resources, agencies and public health administrators seeking to get the most out of their training dollars might consider pre-selecting staff with more favorable EBP attitudes to receive training because they are more likely to see significant gains in knowledge than those with poorer pre-training attitudes. Examined the other way, pre-training knowledge commission errors significantly predicted longitudinal attitude score changes. Specifically, overly inclusive EBP views at pre-training were associated with decreases over time for positive EBP attitudes, suggesting that upon learning that fewer practice elements are evidence-based than they originally thought, providers become less open to trying them over time. This longitudinal finding is consistent with baseline findings we reported elsewhere which suggest that when providers have a more stringent view of what constitutes an EBP, they hold less favorable attitudes towards EBPs (Nakamura et al., 2011). Overall then, our third hypothesis was supported and several relationships between EBP knowledge and attitudes were observed, suggesting a potentially meaningful relationship between these constructs for training and implementation efforts.
Several methodological weaknesses are worthy of mention. First, the study’s design naturally followed providers through workshop attendance patterns ultimately determined by the providers themselves, rather than randomly assigning providers to varying sequence patterns or even perhaps differing training conditions (e.g., brand named protocols, wait list control group). Provider randomization to different training sequences or conditions would have allowed for strong causal inferences about varying types of training protocols. Given Hawaii’s system of care goal of training as many providers as possible in a modular approach to treatment, randomization was unfortunately not possible in this study. The second limitation concerns the nature of our participant sample. As mentioned earlier, data were collected at voluntary trainings on EBPs for trauma, anxiety, and disruptive behavior concerns. Along these lines, perhaps only providers enthusiastic about EBPs in these childhood problem areas attended these workshops. Also as mentioned before, of the 424 providers who attended one or more of these state-sponsored trainings, only 268 providers (63.2% participation rate) filled out one or more questionnaires at any given training, so the problem of sample representativeness could be compounded with regard to desire to fill out study questionnaires within our already self-selected sample.

A third noteworthy weakness concerns the extent to which EBP knowledge was assessed in the current study. Knowledge could have been assessed in a more sophisticated way, and rather than assessing for knowledge at the general awareness level (e.g., does exposure work for anxiety?), knowledge could have been examined at the competence (e.g., how does one apply the specific steps and procedures for successfully doing exposure for childhood anxiety?) or even performance observation level. Indeed, it can easily be argued that the ultimate intention for any training effort should target such higher level constructs (Miller, 1990). Although longitudinally studying competence and performance issues would have been more penetrating for understanding and subsequently designing EBP training efforts, the strategy of assessing only general awareness knowledge occurred for
three reasons. First, the common elements approach to conceptualizing youth EBPs has thus far focused on general technique identification, and not the associated step-by-step procedures for the techniques themselves. Take for instance the technique of exposure for youth anxiety. This practice has been identified as a common element across numerous EBP protocols for youth anxiety, and experts in our field would probably agree that this technique can generally be defined as exercises that involve direct or imagined experience with a target stimulus (Chorpita & Daleiden, 2007). However, consensus becomes more difficult when one tries to define the actual steps associated with this technique.

Exposure approaches can differ along many parameters, such as their emphasis on using other skills (e.g., relaxation, cognitive restructuring) during exposure activities, within-session exposure duration guidelines, and the need to take distress ratings throughout the experience. This is only one example, but underscores the point that without movement towards rudimentary agreed-upon criteria for technique application, assessment of competence- or performance-based knowledge from a common elements perspective can become very difficult. Our second reason for assessing only general awareness knowledge stems from the fact that there are currently no psychometrically-tested competence or performance-based measures for modular approaches to youth EBPs. In fact, even for existing competence- and performance-based instruments associated with standardized treatment manuals, little can be said in the way of psychometric properties because most of these measurement schemes have been ideographically created for their particular research study (Beidas & Kendall, 2010). The third reason for not assessing competence- or performance-based knowledge in this study related to assessment feasibility. Such assessments were not feasible in terms of public sector resources for this naturalistic study in which hundreds of youth providers were trained in a large system of care.

Collectively, the issues above speak not only to potential areas of improvement for the current therapist training study, but the field as a whole for the larger EBP implementation movement. As a field, we need
to further our understanding of what practitioners need to know, and how such knowledge can be best acquired and subsequently implemented with resource-efficient strategies.

A final notable area for improvement concerns the lack of long term follow-up with regard to seeing if knowledge and attitude improvements were maintained over time and resulted in providers’ actual behaviors with youth. In two separate reviews of training efforts for EBPs, Beidas and Kendall (2010) and Herschell and colleagues (2010) reported that traditional training strategies (e.g., reading of manuals, didactic presentation, and workshops) tend to impact at most only providers’ EBP knowledge and attitudes, and not actual practice behaviors or client outcomes. Beidas and Kendall (2010) suggested that both active learning strategies (e.g., modeling, role-plays, practice opportunities) and addressing systems-contextual variables (e.g., quality of training, practitioner variables, client variables, organizational support) surrounding training efforts are important for changing providers’ behaviors and client outcomes. Rakovshik and McManus (2010) reported similar findings on efficacious training practices specific to cognitive behavior therapy. Crucially, they also found that the most efficacious training practices for cognitive behavior therapy emphasized active learning strategies (e.g., modeling, role-play, ongoing supervision after initial workshop), and even calculated that the average number of training hours across the most efficacious training paradigms to be 199 hours (SD = 104 hours).

The implications from these reviews for training public sector providers in EBPs are concerning for at least two reasons. First, the finding that active learning strategies applied across long periods of time is most conducive for EBP training stands in contrast to prevalent practices for continuing education efforts among mental health care professionals. Specifically, as mentioned above, the near-universal pattern across many types of health care professions for continuing education involves attending a half- to full-day seminar or didactic presentation (Institute of Medicine, 2010); namely, the exact methodology that recent reviews warn against if behavior change is the desired outcome (Beidas & Kendall, 2010; Herschell et al., 2010; Rakovshik & McManus, 2010). This problem has slowly
burgeoned over the years, and the Institute of Medicine of the National Academies (IOM; 2010) has recently issued a report and recommendations for completely redesigning continuing education efforts in health professions, starting with the very term itself (i.e., the IOM suggests adopting the term “continuing professional development” over “continuing education”). Furthermore, the second reason for concern stemming from the review studies mentioned above is that even if the major continuing education training paradigm does eventually evolve into continuing professional development activities composed of active learning strategies across extended time periods, the public sector may not have all the resources needed to train its thousands of providers in such a manner. Given that this study was the first to examine the implementation of workshop training in a modular approach to EBPs for youth providers provided by public sector trainers, it represents the first step in an innovative approach to product adaptation in the "real world."

Forthcoming research on EBP training efforts could build upon this study’s limitations mentioned above for furthering scientific understanding into increasing providers’ knowledge of and attitudes towards youth EBPs. Investigations following this study could utilize stronger sampling procedures and a more stringent overall research design. Rather than surveying participants that self-select to EBP training workshops, investigators should also actively pursue participants that would not attend such workshops in the first place. Optimally, such a diverse sample of participants would be randomly assigned to various training sequences or conditions within a research design that could allow for stronger causal inferences with regard to training effects on differential knowledge and attitudinal changes over time. Additionally, research following this study should continue to develop and refine measurement strategies for assessing EBP knowledge among community providers, carefully balancing the need to go beyond assessing general awareness knowledge against the pragmatic difficulties of employing how-to or implementation knowledge tests to large groups of providers with limited resources. The latter type of measurement scheme tends to be time-intensive, with instruments
ideographically created on a study-by-study basis (Beidas & Kendall, 2010), and efforts towards shorter and standardized knowledge instruments may prove fruitful in the larger dissemination and implementation movement. Finally, forthcoming training research on providers’ EBP knowledge and attitudes should additionally investigate other important variables such as providers’ behavior changes and characteristics of the organizations in which providers are embedded (along with knowledge and attitudes), as such studies will help further our scientific understanding and theory behind empirically-based training recommendations for EBPs.

In the meantime, a modular approach to training may hold initial promise for affecting youth provider knowledge and attitudes and might be considered under several circumstances. This approach might be considered, for example, when available public sector resources cannot cover personnel and fiscal expenses for training large amounts of providers on entire brand-named protocols. Instruction with brand-named protocols frequently entails training on a manual in its entirety, time-consuming fidelity checks, and initial and ongoing consultation from external treatment developers; all of which may not seem feasible for large public sector systems, especially when training could potentially focus on hundreds of different manuals. Brief and targeted trainings emphasizing EBP modularity could also be of use when purposefully utilized as a preliminary or triaged step of training. That is, closely related to the recommendation above, systems may explicitly choose to not roll out gold-standard type training experiences when EBP knowledge and attitudes are poor. Within such environments, initial and limited resources may be better spent selectively targeting providers’ EBP knowledge and attitudes (along with other important implementation support factors) in order to set up and support forthcoming intensive training efforts to change actual practice behaviors. Within such a paradigm, emerging standardized youth knowledge and attitude instruments could be used to assess baseline levels of these constructs among direct service providers, and system decisions about costly and empirically-based training recommendations could be rolled out thereafter. It is likely that EBP knowledge and attitudes are
variable across a system’s providers, and personnel could be funneled to varying types of trainings based on their intake knowledge and attitude profiles. Given our findings on increased knowledge commission errors over time, the training model mentioned above would speak to and educate providers about unsupported treatment approaches, in addition to those supported by the evidence base. Importantly, it should also be noted that this suggested approach is not meant to supplant empirically-based training recommendations or established workshop series on proven EBP protocols. Rather, we humbly offer these ideas to help boost training as usual practices for those that cannot afford gold-standard options, and move systems away from all-or-nothing choices regarding EBPs and practice improvement strategies.
Author Note

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References


Table 1.

**Participant Demographic Information**

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<th>Most Advanced Educational Degree</th>
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<th>Professional Disciplines</th>
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<td>Marriage &amp; Family Therapy</td>
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<tr>
<td>Social Work</td>
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<tr>
<td>Psychology or Psychiatry</td>
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<tr>
<td>Other (Nursing, Family Support Worker, “Mental Health Specialist”)</td>
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<td>Behavioral</td>
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<td>Cognitive or Cognitive-Behavior</td>
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<td>Eclectic</td>
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<td>Object Relations</td>
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<td>Psychodynamic</td>
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<tr>
<td>Systems or Family-Systems</td>
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<td>Intensive in-home and community</td>
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Table 2

**Workshop Trainings as Knowledge of Evidence Based Questionnaire Scores Predictors**

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<tr>
<th>Parameter</th>
<th>ANX Target</th>
<th></th>
<th>DBD Target</th>
<th></th>
<th>Commission Error</th>
<th></th>
<th>Omission Error</th>
<th></th>
<th>Total</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>α</td>
<td>SE</td>
<td>α</td>
<td>SE</td>
<td>α</td>
<td>SE</td>
<td>α</td>
<td>SE</td>
<td>α</td>
<td>SE</td>
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<td>Intercept, P0</td>
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<td>0.09***</td>
<td>5.15</td>
<td>0.10***</td>
<td>34.64</td>
<td>1.30***</td>
<td>28.47</td>
<td>1.41***</td>
<td>93.5</td>
<td>0.61***</td>
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<td>INTRO (effect of INTRO)</td>
<td>0.40</td>
<td>0.24</td>
<td>0.28</td>
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<td>3.72</td>
<td>3.05</td>
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<td>1.09</td>
<td>0.22***</td>
<td>0.28</td>
<td>0.26</td>
<td>6.96</td>
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<td>2.33</td>
<td>-4.73</td>
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<td>DBD (effect of DBD)</td>
<td>0.44</td>
<td>0.26</td>
<td>0.78</td>
<td>0.33*</td>
<td>7.21</td>
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<td>2.64</td>
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<td>1.71</td>
<td>2.70</td>
<td>1.67</td>
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**Random Effects**

| Level 1: Residual Variance       | 0.86***    | 1.26***   | 170.95***  | 83.77***  | 43.9***         |
| Level 2: Intercept Variance      | 0.84***    | 1.05***   | 243.29***  | 139.64*** | 37.9***         |

* p < .05 ** p < .01. *** p < .001
Table 3

Workshop Trainings as Evidence-Based Practice Attitude Scale and Modified Practice Attitude Scale Scores Predictors

<table>
<thead>
<tr>
<th>Parameter</th>
<th>EBPAS Appeal A</th>
<th>EBPAS Requirements α</th>
<th>EBPAS Openness α</th>
<th>EPAS Divergence α</th>
<th>EBPAS Total α</th>
<th>MPAS Total α</th>
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<tbody>
<tr>
<td>Intercept, P0</td>
<td>3.11</td>
<td>2.85</td>
<td>3.00</td>
<td>1.05</td>
<td>2.99</td>
<td>21.89</td>
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<tr>
<td>INTRO (effect of INTRO)</td>
<td>0.19</td>
<td>0.16</td>
<td>0.20</td>
<td>-0.06</td>
<td>0.12</td>
<td>0.6*</td>
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<tr>
<td>ANX (effect of ANX)</td>
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<td>0.41</td>
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<td>0.13</td>
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<td>-0.21</td>
<td>-0.06</td>
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</table>

Random Effects

| Level 1: Residual Variance        | 0.17***         | 0.39***               | 0.13***          | 0.17***           | 0.07***       | 6.41***      |
| Level 2: Intercept Variance       | 0.28***         | 0.55***               | 0.30***          | 0.26***           | 0.15***       | 10.89***     |

Note. EBPAS = Evidence Based Practice Attitude Scale; MPAS = Modified Practice Attitude Scale

* p < .05  ** p < .01  *** p < .001