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ORIGINAL ARTICLE

Therapist and Youth Predictors of Specific Practices Derived from the Evidence-Base in Community Mental Health

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Abstract

Over the past several years, youth treatment research has moved toward understanding the dissemination and implementation of evidence-based practices (EBPs). As a result, studies have focused on identifying predictors that aid in successful adoption and sustainment of EBPs. Theories of behavior change posit that therapist knowledge and attitudes play a fundamental role in EBP adoption; however, studies have produced mixed findings, which may be an artifact of broad definitions of both EBP knowledge and EBP itself. The current study was an examination of 46 youth community therapists and the extent to which varying types of knowledge and attitudes as well as youth characteristics predicted specific practices derived from the evidence-base. Results suggested that specific EBP knowledge predicted specific practices, highlighting the need for more specificity when examining predictors of EBP use. Therapists' attitudes, demographic characteristics, and youth characteristics were also significant predictors of EBP use. Future research should consider examining discrete and specific practices to better understand and predict therapists' future behavior.

Keywords Therapist · Youth · Predictors · Evidence-based practice · Practice elements

Introduction

In recent years, evidence-based practice (EBP) implementation has been at the forefront of efforts to improve the quality of services delivered in youth mental health systems (Becker et al. 2009; Fixsen et al. 2005). This effort is due in part to research indicating that youth often do not receive treatment informed by evidence (Daleiden et al. 2004; Kazdin and Blase 2011; Sheehan et al. 2007; Weisz et al. 2000). In response to this need for successful EBP implementation strategies, several researchers have looked to the interdisciplinary health services literature to develop EBP implementation frameworks (Fixsen et al. 2005; Glisson and Schoenwald 2005; Prochaska and Velicer 1997; Wandersman et al. 2008), and have also borrowed from classic behavior change theories (e.g., Ajzen and Fishbein 1977). For example, applying Rogers' (2003) diffusion of innovations theory, some researchers have hypothesized that therapists must possess adequate knowledge of and favorable attitudes toward EBP to adopt them (Aarons 2004; Addis and Krasnow 2000).

Increasing therapist knowledge and positive attitudes have been central in the examination of EBP implementation strategies (Powell et al. 2012, 2015). While therapists' EBP knowledge and attitudinal measures have been developed (Aarons 2004; Borntrager et al. 2009; Stumpf et al. 2009) and studied in community mental health settings (Izmirian and Nakamura 2016; Lim et al. 2012; Nakamura et al. 2011; Okamura et al. 2016), there have been inconsistent findings in the extent to which therapists' EBP knowledge and attitudes predict actual EBP use. Attitudes appear to be more widely studied, with many studies suggesting a significant and positive relationship between EBP attitudes and use (Becker-Haimes et al. 2017; Becker et al. 2013; Beidas et al. 2012, 2015; Kolko et al. 2009; Leathers and Strand 2013; Nelson and Steele 2008). Knowledge has been studied less frequently and has produced mixed findings (Becker-Haimes et al. 2017; Beidas et al. 2012, 2015; Beidas et al. 2012; Harned et al. 2013; Leathers and Strand 2013). For example, Leathers and Strand (2013) found an increase in knowledge was significantly related to use of an online EBP

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resource, while Harned et al. (2013) work indicated that greater knowledge of an exposure protocol led to less frequent use in their randomized controlled trial. Other studies have found that knowledge was not significantly related to EBP use (Becker-Haimes et al. 2017; Beidas et al. 2012, 2015; Beidas et al. 2012; Higa-McMillan et al. 2014).

Mixed knowledge findings may suggest that the way in which EBP is conceptualized and operationally defined is an important consideration when studying the relationship between knowledge and practice. Codd, III (2017) has noted that the terms *evidence-based practice* and *empirically-supported treatment* often are used interchangeably with the unintended consequence of confusing therapists and clients seeking out EBP. According to the American Psychological Association (2005), EBP is the process of integrating the "best available research with clinical expertise in the context of patient characteristics, culture, and preferences (p. 5)." In contrast, Chambless and Hollon (1998) established guidelines for determining empirically-supported treatments that included efficacy trials and replication. Kazdin (2008) noted that empirically-supported treatments are different from EBP in that they refer to clinical innovations that have been tested for efficacy, while EBPs refer to broader clinical practice using the best evidence and client-specific considerations. A recent study found that these two types of knowledge were distinct in youth community mental health therapists (Okamura et al. 2018). Additionally, distillation and matching methodology efforts have summarized the youth treatment outcome literature in the way of highlighting practices derived from the evidence-base (PDE) across hundreds of empirically-supported treatments (Chorpita et al. 2005). Taken together, there appears to be at least three ways of conceptualizing and defining EBP: (a) the APA EBP definition (hereafter referred to as EBP process), (b) through empirically-supported treatments, and (c) by PDE.

Examining findings through the various EBP definitions may help to potentially explain some of the mixed nature of this literature and highlight the importance of precision in knowledge measurement. For example, Leathers and Strand (2013) examined the relationship between therapists' broad PDE knowledge and their use of an online EBP searchable database; whereas Harned et a. (2013) used exposure knowledge to predict exposure treatment use. For the studies that found non-significant EBP knowledge and practice relationships, overall PDE knowledge was used for either predicting specific techniques (i.e., exposure and relaxation use; Becker-Haimes et al. 2017) or larger therapeutic approach usage patterns (e.g., CBT use; Beidas et al. 2015). Thus, it appears that findings are mixed or non-significant when, in fact, the way EBP is defined and knowledge is measured are not aligned. That is, it is still unclear if specific knowledge and specific practice use is related, which is consistent with the notion that therapists' attitudes towards empirically-supported treatments can vary significantly as a function of the specific type of approach being queried (Reding et al. 2014). These findings point toward a need for a more discerning analysis of specific knowledge and practice given that predictors seem to vary according to how practices (e.g., EBP) and knowledge are *defined* and *measured*.

Additionally, therapists' background variables such as cognitive-behavioral or behavioral theoretical orientation, younger age, fewer years of clinical training, Psychology or Psychiatry professional specialty, and doctoral degree also appear to have significant relationships with therapists' EBP use (Becker et al. 2013; Brookman-Frazee et al. 2010; Higa-McMillan et al. 2014; Lewis and Simons 2011; Nelson and Steele 2008). Furthermore, therapist practice use is often dictated by youth characteristics such as diagnosis and age (Jensen-Doss and Weisz 2008). Studying the impact of therapists' attitudes, knowledge, and demographic variables, as well as youth characteristics, on EBP use is important for aiding in EBP implementation efforts.

The current study is an examination of the influence of therapist and youth characteristics on therapist self-reported EBP use. The major aim of the study was to determine the extent to which varying types of therapist knowledge (i.e., EBP process and general awareness knowledge) influence therapist utilization of specific practices derived from the evidence-base (PDE; Higa-McMillan et al. 2014). Our first hypothesis was that general awareness knowledge would be inversely related to PDE use, similar to Harned et al. (2013) findings related to exposure use. Furthermore, given the mixed knowledge-to-practice findings, we exploratorily examined relationships between process knowledge and PDE utilization patterns. Regarding attitudes, our second hypothesis was that positive attitudes toward EBP would significantly relate to more PDE use, with some variation across practices (Reding et al. 2014). Third, it was hypothesized that therapist demographic variables, such as cognitive-behavioral or behavioral theoretical orientation, younger age, fewer years of clinical experience, doctoral degree, and Psychology or Psychiatry professional specialty would also relate to more EBP use. Finally, given that research has suggested that mental health treatment approaches are affected by client characteristics (e.g., age) or problem area (Love et al. 2010; Orimoto et al. 2013), youth age and treatment target were examined within each of the analyses above. Our fourth hypothesis was that age and treatment target would predict PDE use commensurate with the extant literature.

Method

Participants

Intensive in-home therapists from the State of Hawai'i's Child and Adolescent Mental Health Division (CAMHD)

service system were recruited for participation from January to August 2015. All CAMHD intensive in-home state-contracted provider agencies were approached for participation. Six of eight agencies agreed to participate, and there was a total of 119 therapists employed, as reported by individual supervisors. Eighty-four (70.6%) of the 119 therapists were approached at data recruitment events (e.g., see "Procedure" below), and 62 (73.8% of the 84) participated in the study. After accounting for missing practice data, 46 (74.2% of the 62) therapists had completed measures usable for the main analyses (see "Data Analytic Strategy" below). Therapists' age ranged from 24 to 67 ($M = 38.42$, $SD = 10.01$), 73.9% (n = 34) were female, and their primary ethnicities reported were: White (n = 16, 37.2%), Native Hawaiian or Pacific Islander (n = 14, 32.6%), Asian (n = 7, 16.3%), Hispanic or Latino (n = 3, 7%), Alaska Native or American Indian (n = 1, 2.3%), Other (n = 1, 2.3%), and Unknown (n = 1, 2.3%). Three (7%) therapists did not report a primary ethnicity. Therapists came from diverse clinical backgrounds (see Table 1), had an average of 4.68 ($SD = 3.43$) years of clinical training, 6.5 ($SD = 5.63$) years of full time experience, an active caseload of 7.6 ($SD = 5.75$), and received 5.42 ($SD = 2.92$) supervision hours per month.

Additionally, youth demographic and diagnostic information was examined from the 46 participating therapists' caseloads. In total, 472 youth were served by the 46 therapists for the study period, with youth ages that ranged from 3.52 to 21.73 ($M = 14.25$, $SD = 3.57$). Fifty-nine percent (n = 282) of youth were male and 88.1% (n = 416) were multiethnic (i.e., reported more than one ethnicity). Youth and caregivers endorsed all ethnic categories that applied. Broad ethnic categories assessed by CAMHD included 56.4% (n = 266) White, 53.4% (n = 252) Pacific Islander, 48.3% (n = 228) Asian, 11.2% (n = 53) Native American, 8.1% (n = 38) Black, 7.8% (n = 37) Unknown, and 4.2% (n = 20) Other. Youth presented with a wide array of therapist-reported diagnoses and were similar to youth from samples utilized in other CAMHD studies (e.g., predominantly disruptive behavior disordered teenage males; Higa-McMillan et al. 2014; Love et al. 2010; Orimoto et al. 2013).

Table 1 Therapist background information

	n	Percentage
Most advanced educational degree		
Associates or bachelor degrees	1	2.2
Masters-level degrees (e.g., M.Ed., MSW, LCSW, M.A., M.S., R.N., L.P.N.)	39	84.7
Doctoral student, Intern, Psy.D., Ph.D., M.D.	6	13
Professional specialty		
Counseling psychology	15	34.9
Marriage and family therapy	12	27.9
Social work	9	20.9
Psychology or psychiatry	6	14
Substance abuse counselor	1	2.3
Missing	3	7
Theoretical orientation		
Cognitive or cognitive-behavioral	43	93.5
Behavioral	41	89.1
Systems or family-systems	34	73.9
Humanistic	27	58.7
Eclectic	15	32.6
Psychoanalytic	14	30.4
Existential	10	21.7
Other	9	19.6
Primary clinical setting		
Out of home	7	15.6
Intensive in-home and community	34	75.6
Outpatient	1	2.2
School-based	1	2.2
Other	2	4.4
Missing	1	2.3

Therapists were asked to endorse all theoretical orientations

Measures

Evidence-Based Practice Attitudes Scale-50 (EBPAS-50; Aarons 2004; Aarons et al. 2012)

The EBPAS-50 is a 50-item measure of therapist attitudes toward EBP. Participants respond on a five-point Likert-scale the extent to which they agree with a statement, with zero indicating 'not at all' to four indicating 'to a very great extent.' Average scores within the total and subscales are computed, and they range from 0 to 4, with higher scores indicating more favorable attitudes. The EBPAS-50 is comprised of 12 subscales and two were used within the current study's multilevel models: (a) appeal—appeal of EBP and (d) divergence—unfavorable attitudes toward EBP. Internal consistency for the current study was $\alpha_{Feedback} = .92$, $\alpha_{Limitations} = .92$, $\alpha_{Job\ Security} = .90$, $\alpha_{Total} = .88$, $\alpha_{Fit} = .84$, $\alpha_{Requirements} = .83$, $\alpha_{Monitoring} = .82$, $\alpha_{Organization} = .82$, $\alpha_{Burden} = .77$, $\alpha_{Divergence} = .73$, $\alpha_{Appeal} = .64$, $\alpha_{Openness} = .63$, $\alpha_{Competence} = .55$.

Knowledge of Evidence Based Services Questionnaire (KEBSQ; Stumpf et al. 2009)

The KEBSQ is comprised of 40 items, each of which assesses knowledge of therapeutic practices for the youth problem areas of: Anxious/Avoidant (A), Depressed/Withdrawn (D), Disruptive Behavior (B), and Attention/Hyperactivity (H). Respondents are asked to circle all problem areas for which a practice is considered to be derived from the evidence-base. Each individual item is then scored on a

scale from zero to four, with correctly endorsed and omitted responses per problem area receiving one point. Total possible scores on the KEBSQ can range from zero to 160. Stumpf et al. (2009) have demonstrated support for the basic psychometric properties of the measure through test–retest and discriminate validity between community therapists and graduate students, and the factor structure of the KEBSQ has also been examined (Okamura et al. 2016).

Given the multiple true–false format, the KEBSQ items are amenable to problem area specific practice element knowledge examination. For example, in addition to an overall score for Exposure, therapists' knowledge of Exposure for Anxious/Avoidant can also be assessed via the KEBSQ (Lim et al. 2012). This level of measurement was of importance to the current study given the emphasis on specific practice knowledge measurement. For the current study, a subset of 12 practices from the KEBSQ was administered based on the factor structure and previous feedback garnered from therapists' completing the measure (Okamura et al. 2016; Weist et al. 2009). Furthermore, an updated scoring key was developed based on findings in the youth treatment outcome literature consistent with the time of data collection (PracticeWise, LLC 2015). Internal consistency for KEBSQ was not calculated given that item level scores were used. The KEBSQ individual item scores were used to assess general awareness knowledge of specific practices (see "Data Analytic Strategy").

Monthly Treatment Progress Summary (MTPS; CAMHD 2005)

The MTPS is a therapist self-report measure of youth treatment services, including service format, setting, treatment targets, therapeutic practices used, and progress ratings. Therapists provide information on up to ten treatment targets (from a list of 53 predefined targets and two write-in options), the progress ratings associated with each of these targets on a seven-point rating scale ranging from zero (Deterioration) to six (Complete Improvement), and up to 63 predefined and three written-in practices that they used for addressing treatment targets. A comprehensive codebook with treatment target and practice element definitions can be found here: https://health.hawaii.gov/camhd/files/2017/11/MTPS-codebook.pdf. Psychometric evaluations of the MTPS treatment target section of the measure has found support for convergent and divergent validity between targets and diagnoses (Daleiden et al. 2006) and significant and expected relationships between progress ratings and two measures of clinical functioning (Nakamura et al. 2007). Furthermore, adequate test–retest stability, inter-rater reliability, and validity of self-reported practices has been established (Borntrager et al. 2013; Chorpita et al. 2005; Daleiden et al. 2006). Beginning on July 1, 2006, CAMHD required a monthly MTPS for each client every month for organizations to receive reimbursement for services which has resulted in a near perfect completion rate (Nakamura et al. 2007). For the current study, MTPS practice element endorsement was used as the criterion variable (i.e., EBP use) for analyses (see "Data Analytic Strategy").

Practitioner Background Questionnaire (cf. Okamura et al. 2018)

Therapists also provided their (a) age, (b) sex, (c) agency/organization, (d) work zip code, (e) race/ethnicity, (f) racial identity, (g) highest degree, (h) date of most advanced degree, (i) licensure status, (j) professional specialty, (k) primary clinical setting, (l) professional activities, (m) theoretical orientation, (n) years of formal training, (o) years of full time clinical experience, (p) continuing education, (q) active caseload, and (r) supervision hours.

Revised Evidence-Based Practice Process Assessment Scale (R-EBPPAS; Rubin and Parrish 2010)

The R-EBPPAS is a 45-item measure that assesses a therapists' perceptions of the EBP process. Rubin and Parrish (2010) define the EBP process as five steps including: (a) formulating a practice question that can be answered by searching for research evidence, (b) tracking down the best research evidence to answer the question, (c) critically appraising the evidence, (d) integrating the critical appraisal with practitioner expertise and client attributes to guide your practice decision, (e) evaluating the outcomes of the practice decision. The R-EBPPAS measures therapists' familiarity/self-efficacy, attitudes, feasibility, behavioral intention, and actual behavior in the EBP process on a five-point Likert-scale from strongly disagree to strongly agree or never to very often depending on the scale. Rubin and Parrish (2010) confirmed the factor structure and demonstrated good internal consistency among 511 masters in social work students. Internal consistency in the current study was $\alpha_{Total} = .94$, $\alpha_{Familiarity/Self\text{-}Efficacy} = .92$, $\alpha_{Intentions} = .89$, $\alpha_{Behavior} = .88$, $\alpha_{Attitudes} = .86$, and $\alpha_{Feasibility} = .74$.

Procedure

All CAMHD intensive in-home therapist agencies were recruited to participate in this study. Therapists were recruited within one of their agency's existing staff or supervision meetings. The first author provided information about the study (e.g., description and risks of the study) and administered consent forms and measures. Therapists' participation was voluntary (i.e., they could stop at any time) and were compensated with a $5 gift card. The EBPAS-50, KEBSQ 12-item version, Practitioner Background

Questionnaire, and R-EBPPAS were all filled out at agencies' meetings as described above. Therapists' practice data and information about therapists' treated youth on the MTPS were linked to the study's survey battery through participants self-reporting their National Provider Identifier number. Data were electronically extracted from the CAMHD Child and Adolescent Mental Health Management Information System. A time frame of 6 months prior to (i.e., minimum of June 2014) and after (i.e., maximum of September 2015) survey collection was chosen for analyses related to therapists' MTPS practice data to limit the backward prediction of therapist variables while maximizing the sample and power. No other inclusionary or exclusionary criteria were applied. This study was approved by the University of Hawai'i at Mānoa's Committee on Human Subjects and the State of Hawai'i CAMHD. Caregivers of youth who receive services from CAMHD sign an informed consent for the use of data for research purposes which is compliant with the Health Insurance Portability and Accountability Act and Family Educational Rights and Privacy Act.

Data Analytic Strategy

Data Preparation

Participants with over 10% of their total data missing on the KEBSQ, R-EBPPAS, and EBPAS-50 were removed from analyses (cf. Nakamura et al. 2011; Okamura et al. 2016). The number of participants with 10% of their data missing varied by measure: two (3.2%) for the EBPAS-50, three (4.8%) for the R-EBPPAS, and one (1.6%) for the KEBSQ. This listwise deletion strategy resulted in the removal of four therapists (6.45%). Predictive Analytics SoftWare missing values analysis was used to conduct the Missing Completely At Random test (Little and Rubin 1987). Results suggested that missing data within the EBPAS-50 ($\chi^2 = 294.99$, $df = 293$, $p = .46$), KEBSQ ($\chi^2 = 56.94$, $df = 55$, $p = .40$), and R-EBPPAS ($\chi^2 = 87.10$, $df = 88$, $p = .51$) were all Missing Completely At Random. The maximum likelihood method was then used to generate values of the missing data (Little and Rubin 1987). Next, scale and total scores for the EBPAS-50 and R-EBPPAS as well as therapist demographic variables were examined for normality. Standardized z-scores were calculated and any score in excess of 3.29 was considered to be an outlier (cf., Nakamura et al. 2011). All total and subscale scores used in analyses revealed normal distributions.

Multilevel Modeling

Multilevel modeling was used with youth nested within therapists[1] in order handle the hierarchical data structure. SAS PROC GLIMMIX was used to account for the different predictor variable types included within the model and a binary criterion variable. The binary criterion variables corresponded to the 12 items used from the KEBSQ including the PDEs of exposure, cognitive, psychoeducation for youth, relaxation, psychoeducation for caregivers, activity scheduling, maintenance/relapse prevention, problem solving, praise, tangible rewards, time out, and commands. Twelve individual models included PDE endorsement for each month given that each MTPS was an instance for a therapist to endorse PDE use. Consistent with hypotheses, therapist predictor variables included the years of clinical experience, age, KEBSQ item level scores for each PDE as well as the R-EBPPAS familiarity (i.e., EBP process knowledge), R-EBPPAS attitudes (i.e., EBP process attitudes), EBPAS-50 appeal, and EBPAS-50 divergence scaled scores. The R-EBPPAS and EBPAS-50 subscales were chosen to limit multicollinearity within the models and were based on previous studies using the EBPAS (e.g., Higa-McMillan et al. 2014). Therapist theoretical orientation, degree, and professional specialty were omitted as predictors due to low variability (i.e., the majority of therapists endorsed a cognitive-behavioral or behavioral theoretical orientation, Master's degree, and Counseling or Social Work specialty). Related to hypothesis four, youth predictors included age and treatment target on the MTPS. Intercept was considered as having a fixed effect and alpha set at .05 for predictor significance. Post-hoc analyses were conducted to examine the presence of a significant therapist-by-youth interaction. Specifically, when models evidenced significant youth treatment target and therapist specific knowledge predictors, the interaction effect of knowledge and treatment target was examined to explore if more knowledge and the presence of a treatment target increase PDE use.

Results

Descriptive Statistics

Frequencies of the 12 PDE and therapists' corresponding endorsement by problem area are detailed in Table 2. Problem area for each PDE was determined using the PracticeWise Evidence-Based Services Database (PracticeWise, LLC 2015). Specifically, practice elements that were present in 30% or more of the treatment protocols for a given problem area were considered as PDE (cf.

[1] We did not include time as a level within our analyses despite the nested nature of the MTPS within youth. We opted for a two-level model given that we conceptualized each MTPS as an orthogonal decision-making point for the therapist given the youth's current treatment target. Post-hoc analyses that included time in the model did not change the findings related to therapist knowledge or attitudes.

Table 2 Frequencies (%) of practice endorsement within MTPS (N = 2976) and KEBSQ responses

	n	%
Exposure	446	15
For anxiety	41	89.1
Cognitive	1042	35
For anxiety	27	58.7
For depression	31	67.4
For disruptive behavior	18	39.1
Psychoeducation for youth	1059	35.6
For anxiety	25	54.3
For depression	24	52.2
Relaxation	744	25
For anxiety	35	76.1
For depression	14	30.4
Psychoeducation for caregiver	1209	40.6
For anxiety	32	69.6
For depression	30	65.2
For disruptive behavior	39	84.8
For attention/hyperactivity	30	65.2
Activity scheduling	1067	35.9
For depression	42	91.3
Maintenance/relapse prevention	141	4.7
For depression	22	47.8
Problem solving	1572	52.8
For depression	17	37.0
For disruptive behavior	33	71.7
For attention/hyperactivity	28	60.9
Praise	577	19.4
For disruptive behavior	42	91.3
For attention/hyperactivity	30	65.2
Tangible rewards	463	15.6
For disruptive behavior	41	89.1
For attention/hyperactivity	31	67.4
Time out	126	4.2
For disruptive behavior	36	78.3
Commands	274	9.2
For disruptive behavior	39	84.8
For attention/hyperactivity	31	67.4

MTPS monthly treatment progress summary, *KEBSQ* Knowledge of evidence-based services questionnaire; frequencies nested within practices indicate the frequency and percentage of therapists (N = 46) endorsement of the practice being derived from the evidence-base for the given problem area

Table 3 Means (SDs) for EBPAS-50 and R-EBPPAS

	M	*SD*
EBPAS-50	2.22	0.25
Requirements	2.99	0.79
Appeal	3.05	0.58
Openness	2.60	0.60
Divergence	2.91	0.74
Limitations	3.10	0.81
Fit	3.37	0.56
Monitoring	3.11	0.87
Competence	1.59	0.69
Burden	3.21	0.76
Job security	2.15	1.21
Organizational support	2.96	0.96
Feedback	3.41	0.68
R-EBPPAS	163.86	21.19
Familiarity	39.17	5.62
Attitudes	51.65	7.21
Feasibility	17.96	3.17
Intentions	28.04	6.16
Behavior	27.04	6.32

EBPAS-50 evidence-based practice attitudes scale-50 item, *R-EBPPAS* revised-evidence based practice process assessment scale

Higa-McMillan et al. 2014). Therefore, multiple problem areas could be indicated, which created a separate but overlapping sample for each PDE. For example, in Table 2, cognitive was endorsed in 35% ($n = 1042$) of the 2976 MTPS measures in the sample. When referencing the PracticeWise Evidence-Based Services Database, cognitive was indicated as a PDE for the problem areas of anxiety, depression, and disruptive behavior. Within the current sample of 46 therapists, 58.7% ($n = 27$), 67.4% ($n = 31$), and 52.2% ($n = 18$) correctly endorsed the use of cognitive for anxiety, depression, and disruptive behavior, respectively. Time out, maintenance/relapse prevention, and commands were endorsed in less than 10% of the total number of MTPS (N = 2976), therefore models were not conducted due to low variance within the criterion variable. Additionally, EBPAS-50 and R-EBPPAS means and standard deviations are presented in Table 3. Bivariate correlations revealed significant relationships between the EBPAS-50 divergence and R-EBPPAS attitudes scale ($r = .36$, $p < .01$), and the EBPAS-50 appeal scale with therapist age ($r = -.31$, $p < .01$).

Intraclass correlations were calculated based on the null (no predictors) model for the remaining nine PDE (after removing time out, maintenance/relapse prevention, and commands). Each model indicated that the intercept was significant at the .05 level, suggesting that adding youth and therapist predictors would better account for the more than chance findings (Heck et al. 2013). Specifically, intraclass correlations were .57 for problem solving, .56 for psychoeducation for caregivers, .55 for activity scheduling, .55 for cognitive, .55 for praise, .55 for psychoeducation for youth, .54 for relaxation, .54 for tangible rewards, .53 for commands, and .52 for exposure.

Therapist Predictors

Consistent with our first hypothesis, specific PDE general awareness knowledge as measured by the KEBSQ was a significant predictor for relaxation for anxiety (β = 1.40, $p = .04$), psychoeducation for caregiver for disruptive behavior (β = 2.78, $p = .02$), and problem solving for depression (β = − 2.20, $p < .01$). Process knowledge as measured by the R-EBPPAS was not a significant predictor of any PDE. The EBPAS appeal subscale was a significant predictor of cognitive use (β = − 2.15, $p = .01$). Additionally, R-EBPPAS attitudes were a significant predictor of cognitive (β = .17, $p = .01$), praise (β = .11, $p = .05$), and tangible rewards (β = .13, $p = .03$). The R-EBPPAS findings were consistent with our second hypothesis stating that positive attitudes would relate to more PDE use. Finally, consistent with our third hypothesis, therapists' years of clinical training significantly predicted the use of activity scheduling (β = .19, $p = .05$), and therapist age significantly predicted the use of psychoeducation for youth (β = − .11, $p < .01$), relaxation (β = − .07, $p = .03$), psychoeducation for caregivers (β = − .07, $p = .05$), activity scheduling (β = − .14, $p < .01$), and problem solving (β = − .09, $p < .01$).

Youth Predictors

Consistent with our fourth hypothesis, youth treatment target was a significant predictor across all nine PDE. Consistent with the evidence-base, the presence of an anxiety target (β = 1.58, $p < .01$) was a significant predictor for exposure; anxiety (β = .63, $p < .01$), depression (β = .98, $p < .01$), and disruptive behavior (β = .53, $p < .01$) for cognitive; anxiety (β = .52, $p < .01$) and depression (β = .87, $p < .01$) for psychoeducation for youth; anxiety (β = 1.07, $p < .01$) for relaxation; disruptive behavior (β = 1.25, $p = .03$) for psychoeducation for caregiver; and disruptive behavior (β = .76, $p < .01$) and attention/hyperactivity (β = 1.07, $p < .01$) for tangible rewards.

Inconsistent with the evidence-base, the presence of an attention/hyperactivity (β = .97, $p < .01$) target significantly predicted the use of cognitive; disruptive behavior (β = .38, $p < .01$) and attention/hyperactivity (β = .64, $p < .01$) for psychoeducation for youth; disruptive behavior (β = .28, $p = .03$) for relaxation; anxiety (β = .41, $p < .01$) for activity scheduling; anxiety (β = .71, $p < .01$) for problem solving; anxiety (β = .70, $p < .01$) and depression (β = .60, $p < .01$) for praise; and anxiety (β = .57, $p < .01$) for tangible rewards. Interestingly, the presence of depression (β = − .46, $p = .02$) and disruptive behavior (β = − .91, $p < .01$) targets significantly predicted less use of exposure.

Youth age significantly predicted the use of cognitive (β = .13, $p < .01$), psychoeducation for youth (β = .06, $p < .01$), psychoeducation for caregiver (β = − .08, $p < .01$), activity scheduling (β = .06, $p < .01$), problem solving (β = .09, $p < .01$), praise (β = − .13, $p < .01$), and tangible rewards (β = − .09, $p = .03$).

Post-hoc Interaction Analyses

Finally, the interaction between the presence of a youth treatment target and therapist knowledge was explored when both were significant predictors in each model (i.e., in the relaxation, psychoeducation for caregiver, problem-solving, and activity scheduling models). There was a significant interaction between lower knowledge and the presence of a depression target for relaxation use (β = .72, p = .03), lower knowledge and the presence of an anxiety target for psychoeducation for caregiver use (β = .87, p = .01), and lower knowledge and the presence of a disruptive behavior target for problem solving (β = .99, p < .01). There was no significant interaction between activity scheduling knowledge and youth treatment targets.

Discussion

The goal of the current study was to examine the extent to which therapist and youth characteristics impact specific self-reported practices derived from the evidence-base. Of importance was examining varying types of therapist knowledge (i.e., specific PDE and EBP process) and understanding interactions between therapist and youth variables. Results suggest that therapist and youth variables differentially impact the use of practices derived from the evidence-base. Furthermore, therapist and youth variables may interact in a counterintuitive way, which may be representative of therapists' overly restrictive view of the evidence-base. Overall, the most robust predictor was youth treatment target, and despite hypotheses grounded in theories of behavior change, therapists' knowledge of and attitudes toward EBP emerged significant for only a handful of PDE. Our findings support the notion that therapists' knowledge of and attitudes toward EBP vary by practice (Reding et al. 2014), suggesting the need for careful and nuanced definition and measurement of practices moving forward.

Therapist specific PDE knowledge as measured by the KEBSQ was significant and positive for relaxation for anxiety and psychoeducation for caregiver for disruptive behavior. This suggests that therapists with more knowledge regarding relaxation (for anxiety) and psychoeducation for caregiver (for disruptive behavior) use relaxation and psychoeducation for caregiver more often. Interestingly, we found a negative effect for problem solving knowledge, suggesting that problem solving is used more by therapists who have less general awareness knowledge of problem solving for depression. These negative effects for general

awareness knowledge were also evidenced in the presence of a corresponding youth treatment target for relaxation (for depression), psychoeducation for caregiver (for anxiety), and problem solving (for disruptive behavior). It is important to note that these negative knowledge effects were found within problem areas for which these practices are not typically indicated. For example, it is common to use relaxation for anxiety (positive knowledge effect) and perhaps less common to use relaxation for depression (negative interaction effect with depression target). This may be reflective of therapists having an overly restrictive view of the extent to which practices are used for multiple problem areas and may suggest a need for further understanding therapists' beliefs regarding the applicability and flexibility in using specific PDE.

Process knowledge was not a significant predictor of specific PDE usage which may reflect substantive findings or construct measurement difficulties. While knowledge and use were at the specific PDE level, process knowledge was measured globally (not specific to a PDE). Therefore, it may be that EBP process knowledge would be a better predictor of overall EBP process use or general EBP practice. Future research may stand to benefit from forthcoming measurement precision developments in this area. For example, Higa-McMillan et al. (2017) recently and utilized the Practice Element Response Form (PERForm; Nakamura and Higa-McMillan 2015), a therapist-report measure of treatment procedural knowledge at the practice element level (e.g., exposure), for examining training effects among diverse samples of trainees. It may be that the relationships between knowledge, attitudes, and behaviors vary across different types of practice elements and measurement schemes specific to those discrete practices.

Consistent with our second hypotheses, EBP process attitudes were significant in predicting the use of praise and tangible rewards. This suggests that therapists who have more favorable attitudes toward the EBP process use praise and tangible rewards more frequently. Contrary to our hypotheses, cognitive use was significantly predicted by higher EBP process *and* lower EBPAS appeal attitudes. This mixed finding suggests that therapists who utilize the cognitive technique more often have positive EBP process attitudes while finding EBP less appealing. This nuanced finding may be reflective of the individual items within the R-EBPPAS and EBPAS appeal scale. More specifically, the R-EBPPAS attitudes scale items are reflective of valuing science over clinical intuition whereas the EBPAS appeal scale items are reflective of EBP being intuitively appealing and valued by other colleagues. It makes sense then that therapists who value science have lower attitudes toward EBP being intuitively appealing, and this combination of attitudes are reflective in therapists who use a practice that mirrors those values. More specifically, cognitive use requires the careful monitoring of specific thoughts and finding evidence to contradict those maladaptive thoughts. Therefore, a therapist who values the EBP process and not intuition would tend to use the cognitive technique more frequently. Additionally and consistent with hypothesis three, therapists' years of clinical training and age significantly predicted practice use. Therapists with more clinical experience used activity scheduling more whereas younger therapists more often used psychoeducation for youth, relaxation, psychoeducation for caregiver, activity scheduling, and problem solving.

Our relatively few significant therapist knowledge and attitudinal findings hopefully begin to shed light on the mixed findings related to therapist knowledge and attitudes predicting EBP use (Becker-Haimes et al. 2017; Beidas et al. Harned et al. 2013; Higa-McMillan et al. 2014; Leathers and Strand 2013). Consistent with Reding et al. (2014) study examining therapists' specific practice attitudes, it appears that there are differential predictors of specific practice use, and a narrowed focus into specific practices is needed to fully understand the muticontextual nature of these relationships. Furthermore, theories of behavior change have often hypothesized that knowledge and attitudes, among other individual characteristics, are needed to predict behavior, with knowledge often being a more distal predictor than attitudes (Ajzen and Fishbein 1977). These theories have often focused on very specific behaviors (e.g., smoking) versus broad categories of behaviors (e.g., healthy choices). Therefore, when examining predictors, it may be beneficial to focus on specific behaviors, like the current study, rather than EBP use in general (Mandell et al. 2017). Also, implementation science has begun to elucidate the importance of organizational support in fostering both therapist knowledge and attitudes (Becker-Haimes et al. 2019; Beidas et al. 2015; Mandell et al. 2017). Larger-scale implementation studies or combinations of existing datasets are needed to examine organizational, therapist, and client predictors of practice use. By including youth variables, this study began to investigate patient level characteristics regarding potential influence on implementing specific practices.

Youth treatment target was the most robust predictor across all nine PDE, suggesting that the context under which therapists' use specific practices are especially important. However, almost half of the significant youth treatment target predictors were inconsistent with the evidence-base, signifying that therapists may be incorrectly using these practices. Research has suggested that therapist EBP training may have a detrimental effect in that therapists begin to use practices for clients who do not meet criteria to receive the treatment (Beidas et al. 2015, 2016). Therefore, careful attention and time should be devoted in training to include diagnostic and screening tools as well as evidence-based assessment throughout treatment to monitor progress. Our findings may be reflective of the need for more focused

trainings in evidence-based assessment to clarify specific practices for specific problem areas. These findings may also reflect an artifact of our study design such that practice elements could have been considered as PDE for multiple problem areas (i.e., comorbidity). Sample refinement may be helpful to future studies to further delineate the problem area and practice relationship. Finally, youth age significantly predicted the use of cognitive, psychoeducation for youth, psychoeducation for caregiver, activity scheduling, problem solving, praise, and tangible rewards. Younger youth were more likely to receive psychoeducation for caregiver, praise, and tangible rewards whereas older youth were more likely to receive cognitive, psychoeducation for youth, and problem solving. These findings are consistent with treatment outcome literature (PracticeWise, LLC 2017), providing more nuance to our statement that future therapist training should focus more time on the *problems* for which practices are derived from the evidence-base and less on the age ranges. Moreover, therapist training should be considered an ongoing process (Beidas and Kendall 2010), and embedded into organizations through supervision and policy support to continually refine therapist knowledge and skill.

Considering our findings, a few limitations should be discussed. First, we relied solely on therapist-report at both levels of the predictor and criterion variable, which did not account for procedural (i.e., how-to) knowledge or the extensiveness of their PDE use. This limitation is particularly important to the criterion variable as the MTPS measure is tied to billing. However, it is extremely important to note that only completion and submission of the MTPS to CAMHD computer management systems is linked to billing, and not the actual constellation of therapist-reported targets and practices. Additionally, studies have shown that therapists can be accurate reporters of in-session behavior, especially with the MTPS measure (Borntrager et al. 2013). Second, we did not include youth clinical outcomes, so it is unclear the extent to which the use of these practices impact youth clinical symptoms and their functioning. The relatively few studies have suggested that the dosage rather than the specificity of the practices impact clinical symptoms and functioning (Love et al. 2010; Orimoto et al. 2012). Given our findings related to youth treatment target and age, it is possible that therapists are adapting treatment to meet the needs of the youth and family. For example, one potential moderating effect here could be therapeutic alliance and the extent to which both therapist and youth feel that treatment is addressing youth concerns. The current study did not assess for therapeutic alliance and future studies may wish to include measures as they relate to therapist EBP use and youth outcomes. Fourth, it is important to note that the EBPAS-50 Appeal subscale had a less than optimal reliability coefficient ($\alpha = .64$) which may have influenced attitudinal findings. Future studies may wish to explore other EBPAS-50 subscales related to EBP use. Finally, within our sample of therapists, knowledge of exposure (41 therapists got this correct, 89.1% of total sample), activity scheduling (n = 42, 91.3%), praise (n = 42, 91.3%), and tangible rewards (n = 41, 89.1%) were nearly perfect which may have inadvertently affected our results. Finding a sample of therapists with varying knowledge and attitudes will be a worthwhile endeavor for future studies.

Despite these limitations, our study provides initial evidence to support the idea that therapist and youth predictors differentially impact practice use in a large youth mental health system. Our findings suggest that therapist practice decisions are not solely reliant on therapist knowledge or attitudes alone, but a combination, and for some an interaction, between youth and therapist characteristics. Understanding and unpacking these differences in how organizational, therapist, and youth predictors impact specific practices is both important to our field's understanding of effective implementation strategies such as training and consultation, and to future research on the relationship of accurate knowledge and attitudinal measurement. Furthermore, utilizing existing administrative data to unearth nuance in practice use appears to be a worthwhile endeavor to inform future clinical trainings. Incorporating clinical outcomes will be a further step to finding the right contexts in which to implement EBP to alleviate the suffering of youth with mental health concerns.

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Compliance with Ethical Standards

Conflict of interest The authors declare they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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