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Community-Based Providers' Selection of Practices for Children and Adolescents With Comorbid Mental Health Problems

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Abstract

The goal of this study is to explore providers' patterns of implementation by investigating how community mental health providers selected therapy practice modules from a flexible, modular evidence-based treatment working with youths with comorbid mental health problems. Data were obtained from 57 youths, 5–15 years old, presenting with anxiety, depressive, and/or conduct problems and their 27 providers during their participation in an effectiveness trial involving a modular evidence-based treatment. Although all youths evidenced clinically elevated symptomatology in at least two problem areas, providers targeted youths' comorbid problems with only about half of their study cases. Practice modules indicated for youths' comorbid problems were typically used less frequently and with less depth relative to practice modules indicated for youths' principal clinical problem and were often transdiagnostic in nature (i.e., designed to target more than one problem area). To determine whether providers' decisions to target youths' comorbid problems were systematic, multilevel, logistic regression analyses were conducted and revealed that youths' pretreatment characteristics and time in therapy influenced providers' patterns of module selection. Providers tend to use, but not exploit, the flexibility allowed by modular EBTs and to focus treatment on youths' principal presenting problem. In addition, providers appear to make these practice choices in a systematic and rational manner, and whether and which choices are associated with improved outcomes is an important area of future study.

The current realities that an estimated 15 million children access mental health care (U.S. Department of Health and Human Services, 1999) and that treatment for mental illnesses has the highest expenditures of any childhood ailment (Soni, 2009) underscore the urgent need to improve the quality of mental health services for children and families. Accordingly, the past two decades have been characterized by a remarkable upsurge of resources and efforts dedicated to identifying efficacious treatment strategies for use within community-based mental health service settings (Calhoun, Moras, Pilkonis, & Rehm, 1998; Chambless & Hollon, 1998; Lonigan, Elbert, & Johnson, 1998; National Advisory Mental Health Council Workgroup on Child and Adolescent Mental Health Invention and Deployment, 2001; President's New Freedom Commission on Mental Health, 2003)—resulting in a now-extensive compendium of evidence-based treatment (EBT) protocols for a wide variety of child psychopathologies (e.g., Chorpita, Bernstein, & Daleiden, 2011). Despite this significant progress, the public health impact of these treatments has been less than expected

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or desired (Kazdin & Blase, 2011; Rotheram-Borus, Swendeman, & Chorpita, 2012). That is, community mental health providers tend to use EBTs infrequently and with low intensity (Garland et al., 2010), and although EBTs have been shown to consistently outperform usual care within the context of randomized clinical trials (Weisz, Jensen-Doss, & Hawley, 2006; Weisz, Weiss, Han, Granger, & Morton, 1995), findings regarding EBT effectiveness within community mental health settings have been mixed (e.g., Southam-Gerow et al., 2010; Weisz et al., 2012).

A commonly cited barrier to the effective implementation of EBTs within the community is that most EBTs have not been designed to address the complex diagnostic profiles that are frequently evidenced by publicly referred youths (Weisz et al., 2013). Specifically, studies indicate that youths treated in community mental health clinics have significantly more comorbid diagnoses (Southam-Gerow, Weisz, & Kendall, 2003), present with more severe externalizing symptoms (Ehrenreich-May et al., 2011), demonstrate poorer functioning at school, and experience significantly more life stressors (Southam-Gerow, Chorpita, Miller, & Gleacher, 2008) relative to those treated in university clinics. In addition, although most EBT protocols focus on a single disorder or class of disorders, children referred for mental health services often present with multiple problems (e.g., Angold, Costello, & Erkanli, 1999; Southam-Gerow et al., 2003)—with one study showing that an estimated 40% of youths with mental illness meet criteria for more than one class of disorders (e.g., anxiety and disruptive behavior disorders; Merikangas et al., 2010). Such discrepancies between the characteristics of EBTs for childhood psychopathology and the characteristics of children referred for community mental health services have prompted many to begin to consider how the design and implementation of EBTs can be improved to better address diagnostic comorbidity.

One approach for addressing this challenge is to utilize modular treatment design. The rationale behind modular treatment design is to allow for flexibility in the content and coordination of therapy practices in order to enhance the fit between EBTs and the contexts in which they are ultimately being applied—whether those contexts include diagnostic comorbidity, emergent life events (e.g., Chorpita, Korathu-Larson, Knowles, & Guan, 2014), poor response to treatment (e.g., Tsai, Moskowitz, Brown, Park, & Chorpita, 2016), or other complexities that may arise during the course of therapy. Specifically, modular treatment design separates practice content (e.g., exposures for anxiety, relaxation skills, rewards) from practice coordination (e.g., implement exposures for anxiety after creating a fear hierarchy, implement a rewards system if a client seems unmotivated to participate in therapy) to allow therapy procedures to be applied in an individualized manner without compromising the delivery of or empirical support behind the treatment (Chorpita, Daleiden, & Weisz, 2005). Modular treatments have several benefits in that they can aggregate many practices from the extensive literature on EBTs into more manageable treatment packages; they can expand the diagnostic range of traditional EBTs by utilizing therapy practices relevant to multiple disorders; and they allow for real-time, informed adaptation (Weisz & Chorpita, 2011). In addition, mounting evidence suggests that modular treatments can improve youth outcomes (e.g., Chorpita, Taylor, Francis, Moffitt, & Austin, 2004; Kolko et al., 2009; Storch et al., 2013). For instance, in a recent randomized trial that evaluated the effectiveness of a modular EBT for youths 7–13 years of age with clinically elevated

symptomatology in the areas of anxiety, depression, or conduct, the modular EBT demonstrated superior outcomes compared to traditional, single-diagnosis EBTs and usual care in terms of clinical improvement (Chorpita et al., 2013; Weisz et al., 2012), subsequent service utilization (Park et al., 2016), and provider attitudes (Borntrager, Chorpita, Higa-McMillan, & Weisz, 2009; Chorpita et al., 2015).

Although modular treatment design appears to be well equipped to allow management of the complex cases so often seen in community mental health settings, a common criticism of modular treatments is that they promote overly flexible EBT practice implementation. Despite preliminary evidence suggesting that providers trained in a modular EBT tend to use EBT practices in the vast majority of their treatment sessions and to make relatively few adaptations to EBT protocols during the implementation process (Palinkas et al., 2013; Park, Chorpita, Regan, & Weisz, 2015), skepticism remains as to whether the flexibility allowed by modular design encourages protocol drift—particularly during occasions when interferences to treatment, such as diagnostic comorbidity, arise as they often do (Chorpita et al., 2014).

The present study thus investigated how community mental health providers coordinated therapy practices from a modular EBT for youths with comorbid symptomatology. The study aims were to (a) descriptively examine providers' implementation of practices that target either their client's principal presenting problem or any comorbid problems, and (b) assess the systematic nature of providers' decisions to target their client's principal or comorbid problem. The first aim was met by investigating providers' EBT practice coordination at both the episode level (e.g., How many clients received at least one practice prescribed to target a comorbid problem during their course of therapy?) and session level (e.g., When practices indicated for a comorbid problem were covered in session, how extensively were they covered? What were commonly used practices for targeting comorbid problems?). The second study aim was met by examining the effect of client characteristics (i.e., type of principal problem, type of comorbid problem, age, gender, pretreatment problem severity) and treatment progress (i.e., present severity of the principal problem, present severity of a comorbid problem, and time in therapy) on providers' implementation of practices prescribed to target the principal presenting problem or a comorbid problem.

Given that externalizing symptoms (e.g., arguing, disobeying instructions from parents or teachers) tend to be more noticeable and disruptive to treatment than internalizing symptoms (e.g., feeling fearful, feeling worthless or unhappy, worrying a lot), it was hypothesized that providers would attend to a principal problem (or comorbid problem) of conduct more than a principal problem (or comorbid problem) of anxiety, depression, or traumatic stress. It was also predicted that youths' age and gender would impact a providers' treatment plan, as there are differences in comorbidity patterns between boys and girls and between younger and older children (Bird, Gould, & Staghezza, 1993) and as certain therapy practices may be more or less appropriate for children given their developmental level (e.g., cognitive therapy techniques may not be appropriate for children in the preoperational stage of cognitive development; Grave & Blissett, 2004). In addition, it was predicted that the severity of the principal and comorbid problems would influence the focus of a given session such that providers would be more likely to target their client's principal problem (or comorbid

problem) if the principal problem (or comorbid problem) increased in severity. Relatedly, it was hypothesized that youths' time in therapy would predict providers' implementation of practices prescribed to target youths' principal or comorbid problems (e.g., Orimoto, Mueller, Hayashi, & Nakamura, 2014), such that providers may focus on addressing youths' principal problem earlier in the treatment episode and may introduce practices for addressing a comorbid problem later in the treatment episode after youths' dysfunction with their principal problem has been better managed.

METHOD

Data were collected during the treatment phase of a community-based randomized clinical trial comparing a modular EBT with multiple community-implemented EBTs (e.g., Southam-Gerow et al., 2014) for children and adolescents presenting with problems in the areas of anxiety, depression, or conduct (see Chorpita et al., 2016, for more information). The treatment phase of this trial took place in Los Angeles, CA, from 2010 to 2014. All study procedures were approved by the Institutional Review Board of the University of California, Los Angeles.

Participants

Youth Participant Sample—Of the 78 children and adolescents who received the modular EBT in the clinical trial, 57 youths were included in this study. Given the study aims, youths from the clinical trial were excluded if (a) their principal problem area changed during the course of treatment ($n = 11$; this criterion was intended to exclude youths whose principal problem area may have been misidentified at the start of treatment, as may have been the case if multiple problem areas were clinically elevated) or (b) their caregivers did not endorse problems related to their principal problem area and at least one comorbid problem area ($n = 10$; this criterion was necessary to test whether present severity ratings predicted practice implementation, as weekly severity ratings were obtained only for caregiver-nominated problems). There were no significant differences between youths included in and excluded from this study in terms of demographic characteristics, principal problem area, or baseline symptom severity. Youths in this sample were predominantly boys (53%) and ranged from 5 to 15 years of age ($M = 9.63$, $SD = 2.85$) and in grade level from kindergarten to 11th grade. The majority of youths were Latino/a or Hispanic (82%) and were born in the United States (95%). Annual family income was less than $40,000 for 89% of the sample, and supported an average of 3.87 ($SD = 1.55$) dependents. The youths' primary caregivers ranged from 24 to 70 years of age; 86% were the youths' biological mothers. Twenty-five percent of the caregivers reported that they were married, 25% reported that they were separated from their partner, 23% reported that they never married, 12% reported that they were living with their partner, and 12% reported that they were divorced; 46% of youths' caregivers endorsed that they did not finish high school. More than half of the caregivers were born outside of the United States (63%), and reported that their families spoke Spanish in the home (60%).

Youths from this sample were referred for the clinical trial for concerns related to anxiety, depression, conduct, and/or traumatic stress and had clinically elevated symptomatology in an average of 2.54 (*SD* = .63) problem areas (see Table 1).

Provider Participant Sample—This study consisted of 27 providers who worked for one of three community mental health agencies in Los Angeles County. Of these providers, 41% were Latino/a or Hispanic, 33% were Caucasian, 11% were of mixed ethnicity, 11% were Asian American, and 4% were African American. Forty-one percent of the providers were fluent in Spanish. Providers were predominantly female (96%); they averaged 32.37 (*SD* = 3.85) years of age and 2.70 (*SD* = 2.02) years of clinical experience since obtaining their most advanced degree. Most providers were master's level (81%) and unlicensed (81%); 44% listed their primary theoretical orientation as eclectic, 30% as cognitive–behavioral therapy, 11% family systems, 7% as humanistic, and 7% as "other."

Prior to the start of the trial, providers attended a 5-day training on the Modular Approach to Therapy for Children with Anxiety, Depression, Trauma, or Conduct Problems (MATCH-ADTC; Chorpita & Weisz, 2009) manual. The MATCH-ADTC manual features a library of EBT practices drawn from the evidence base on cognitive–behavioral therapy for anxiety, cognitive–behavioral therapy for depression, cognitive behavioral therapy for traumatic stress, and behavioral parent training for conduct problems. In addition, the MATCH-ADTC manual includes a series of protocol flowcharts that specify a default sequence of practices for each of the four problem areas (i.e., anxiety, depression, trauma, and conduct) but that allow for adaptations to the selection and sequencing of practices if interferences arise (e.g., if a comorbid problem impedes the course of treatment). Following training, providers received weekly supervision from expert study consultants to support their delivery of the MATCH-ADTC manual with study cases.

Measures

Consultation Record—The Consultation Record is a measure that documents the therapy practices delivered in each treatment session. The measure is organized into a matrix of checkboxes in which rows list practices corresponding to MATCH-ADTC content (e.g., exposures for anxiety or relaxation skills for depression), as well as an "other" practice write-in option (e.g., assessment, case management, crisis management), and columns list questions associated with the delivery of those practices (e.g., Was the practice covered fully in session? Was the practice covered partially in session? Was the practice role-played in session?). A practice was considered to be covered fully if more than 80% of that practice's prescribed content was determined to have been covered in session. The Consultation Record was completed for every treatment session by doctoral study consultants during weekly individual consultation meetings with providers. During these meetings, consultants would conduct a semistructured interview regarding the practices used in a provider's most recent therapy session with her or his client and mark the corresponding checkboxes on the Consultation Record. For example, if a provider reported that she covered half of the strategies listed in the Psychoeducation about Anxiety for Caregivers practice, then the consultant would mark the checkbox corresponding to the Psychoeducation about Anxiety for Caregivers row and the Was the Practice Covered Partially in Session? column. In

situations where the provider's report was unclear, consultants were directed to ask open-ended, validating questions for clarification. The Consultation Record has evidenced strong agreement between provider-report of session content and coder observation of audio- and videotaped session recordings (*M* intraclass correlation coefficient = .71; Ward et al., 2012). Within this trial, agreement between practice administration indicated on the Consultation Record and practice administration codified from audio recordings from a sample of 30 sessions was similarly strong (κ = .62).

Top Problems Assessment for Caregivers—The purpose of the Top Problems Assessment for Caregivers (TPA) is to gather information about the problems of greatest concern to youths' caregivers. After participating in a structured, pretreatment interview, caregivers were asked to list the most concerning problems experienced or exhibited by their youths. The interviewer would then record these responses in the caregivers' own words (e.g., "She worries about being away from me"; "He has temper tantrums") and ask the caregiver to rate the severity of each problem on a 0-to-10 scale, with higher ratings indicating greater problem severity. Next, caregivers were given a list of all the problems that they had identified and were asked to select the one that was currently the biggest problem, which was assigned Rank 1. The interviewer would then ask each caregiver to identify the next biggest problem and assign that Rank 2, and so forth. The TPA thus generated a ranked list of the top problems identified by the caregiver. During the course of treatment, telephone interviewers obtained weekly severity ratings of the top three problems that caregivers identified as the biggest problems. The TPA has evidenced acceptable test–retest reliability, convergent and discriminant validity, sensitivity to change, and slope reliability (Weisz et al., 2011).

Strengths and Difficulties Questionnaire—The Strengths and Difficulties Questionnaire is a 25-item measure that prompts caregivers to rate their youths' positive and negative attributes on a 3-point Likert scale, ranging from 0 (*not true*) to 2 (*very true*). The questionnaire's 25 items are divided into five subscales: Emotional Symptoms, Conduct Problems, Hyperactivity-Inattention, Peer Problems, and Prosocial. For this study, pretreatment scores on the Emotional Symptoms, Conduct Problems, Hyperactivity-Inattention, and Peer Problems subscales were used to operationalize youths' pretreatment problem severity. The Strengths and Difficulties Questionnaire has evidenced good factorial validity, internal consistency (α = .73), and test–retest reliability (*r* = .62; Goodman, 2001).

Procedure

Prior to each youth beginning therapy, a team comprising doctorate-level study staff, in conjunction with the Principal Investigator, determined youths' principal problem area (i.e., anxiety, depression, or conduct) via scores from youth- and caregiver-identified top problems, as well as youth- and caregiver-reports on the Strengths and Difficulties Questionnaire (Goodman, 2001), Revised Child Anxiety and Depression Scales (Chorpita, Moffitt, & Gray, 2005; Ebesutani, Bernstein, Nakamura, Chorpita, & Weisz, 2010, 2011; Ebesutani, Tottenham, & Chorpita, 2015), and UCLA PTSD Reaction Index (Steinberg, Brymer, Decker, & Pynoos, 2004). Initial treatment selection decisions were based off of the protocol flowchart indicated for youths' principal problem area (e.g., providers treating

youths with a principal problem of anxiety were expected to deliver rapport-building practices and to provide basic information about anxiety in the first session). Treatment selection decisions over the course of therapy, which were ultimately acted on by the provider, involved consideration of the protocol flowchart, discussion with an expert consultant, and review of current progress depicted on a measurement feedback system.

Because youths' presenting problems can change during the course of therapy, treatment interference relating to comorbidity was conceptualized as concerns in any problem area besides the principal problem area, regardless of whether difficulties associated with that problem area were endorsed at the pretreatment assessment. Sessions were considered to have targeted a client's comorbid problem area if the provider at least partially covered one practice from the MATCH-ADTC manual that was indicated for a problem area other than the client's principal problem area. Sessions were regarded as targeting a client's principal problem area if the provider at least partially covered one practice from the MATCH-ADTC manual that was indicated for the client's principal problem area.

Data Analyses—To assess the systematic nature of providers' selection of practices targeting youths' principal and comorbid problem areas, a multilevel model for each criterion variable (i.e., whether the session featured a practice indicated to address the principal problem area and whether the session featured a practice indicated to address a comorbid problem area) was estimated with the following predictors: principal problem area (dummy coded with conduct as the reference group), comorbid problem of anxiety, comorbid problem of depression, comorbid problem of traumatic stress, comorbid problem of conduct, age, gender, pretreatment Emotional Symptoms score, pretreatment Conduct Problems score, pretreatment Hyperactivity-Inattention score, pretreatment Peer Problems score, weekly TPA rating of principal problem, weekly TPA rating of comorbid problem, and time in therapy (in months). Given that the decision to shift the problem area focus of a specific session is likely based on a youth's individual progress, weekly TPA ratings of the principal problem and any comorbid problems were centered around each youth's average principal problem TPA rating and average comorbid problem TPA rating, respectively. Youths' average principal problem TPA ratings and average comorbid problem TPA ratings were included in the models to control for between-person differences in the effects of principal and comorbid problems. Youths' termination status (i.e., premature termination vs. routine termination) was also included as a control variable.

Likelihood ratio tests were used to examine the necessity of a three-level model (sessions nested within clients nested within providers) compared to the two-level model (sessions nested within clients). Results indicated that the three-level model did not significantly improve fit over the two-level model: principal problem session focus criterion variable, $x^2(1) = 1.29$, $p = .26$; comorbid problem session focus criterion variable, $x^2(1) = 1.12$, $p = .29$. Thus, analyses involved two-level models for parsimony. Weekly TPA severity ratings for clients' principal and comorbid problem areas and time in therapy were modeled as Level 1 predictor variables. Clients' type of principal problem, type of comorbid problem, age, gender, and pretreatment problem severity were modeled as Level 2 predictor variables. Multilevel logistic regression analyses were performed in SAS 9.4 using PROC GLIMMIX.

Missing Data—Because weekly TPA ratings were gathered only for youths' top three problems as ranked by their caregivers, two youths were missing weekly severity ratings for their principal problem area and nine youths were missing weekly severity ratings for a comorbid problem area. Missing data from the respective 42 sessions and 218 sessions were imputed using two-level multiple imputation (Mistler, 2013a) to generate 20 complete data sets (cf. Graham, Olchowski, & Gilreath, 2007) with 1,000 iterations separating each saved data set. The imputation model included all variables used in the analyses and weekly scores from an auxiliary caregiver-report measure of internalizing and externalizing symptoms (Chorpita et al., 2010). After creating the 20 imputed data sets, regression models were estimated for each data set and estimates from those models were pooled (Mistler, 2013b[1]).

RESULTS

Patterns of Implementation

Treatment episodes ranged from three to 60 sessions (M = 22.53, SD = 13.28) and from 1.15 to 16.50 months (M = 6.55, SD = 3.94). The number of practices delivered in a session ranged from one to seven (M = 1.82, SD = .84).

Episode Level—Of the 57 youths in the sample, 32 (56%) received practices indicated for both their principal problem area and a comorbid problem area during their treatment episode: Nine (60%) had a principal problem area of anxiety, 11 (61%) had a principal problem area of depression, and 12 (50%) had a principal problem area of conduct. The remaining 25 (44%) youths received practices indicated only for their principal problem area during their treatment episode.

Providers delivered practices indicated for youths' principal problem area over an average of 15.79 sessions (SD = 8.36, Mdn = 16, range = 1–35). Providers targeted youths' principal problem area of anxiety over an average of 16.87 sessions (SD = 9.77, Mdn = 16, range = 1–32), principal problem area of depression over an average of 19.28 sessions (SD = 6.99, Mdn = 18.5, range = 5–35), and principal problem of conduct over an average of 12.50 sessions (SD = 7.38, Mdn = 12, range = 2–24).

Providers delivered practices indicated for youths' comorbid problem area over an average of 4.37 sessions (SD = 6.71, Mdn = 1, range = 0–29). For youths with a principal problem area of anxiety, providers targeted a comorbid problem over an average of 3.40 sessions (SD = 5.17, Mdn = 1; range = 1–14). For youths with a principal problem area of depression, an average of 5.39 sessions (SD = 8.21; Mdn = 1.5, range = 0–29) targeted a comorbid problem. For youths with a principal problem area of conduct, an average of 4.21 sessions (SD = 4.21, Mdn = .50, range = 0–22) involved the delivery of a practice indicated for a comorbid problem.

Session Level—As shown in Table 2, providers delivered practices indicated for youths' principal problem more frequently and with greater depth than practices indicated for

[1]The SAS macro for computing pooled likelihood ratio tests with multiply imputed data (Mistler, 2013b) was adapted such that analyses were performed in PROC GLIMMIX as opposed to PROC MIXED because the criterion variables were dichotomous.

youths' comorbid problem. Specifically, of the 1,284 total sessions, providers delivered a practice indicated for youths' principal problem in 900 sessions (70%), a practice indicated for a comorbid problem in 248 sessions (19%), and an "other" practice in 287 sessions (22%). Practices indicated for youths' principal problem were covered fully in 391 sessions (43%); practices indicated for youths' comorbid problems were covered fully in 69 sessions (28%).

Of the 319 sessions with youths with a principal problem area of anxiety, providers delivered a practice indicated for anxiety in 253 sessions (79%), a practice indicated for a comorbid problem area in 50 sessions (16%), and an "other" practice in 52 sessions (16%). The most frequently implemented practice for youths with a principal problem area of anxiety was Practicing (i.e., exposing the child to feared items or situations; $n = 98$ sessions; 31%), followed by Fear Ladder (i.e., identifying anxiety-provoking situations; $n = 51$ sessions; 16%) and Learning About Anxiety—Child (i.e., teaching the child about how anxiety works and how exposing himself or herself to feared situations will help to alleviate feelings of anxiety; $n = 50$ sessions; 16%).

Of the 492 sessions with youths with a principal problem area of depression, providers delivered a practice indicated for depression in 347 sessions (71%), a practice indicated for a comorbid problem area in 97 sessions (20%), and an "other" practice in 110 sessions (22%). The most frequently implemented practice for youths with a principal problem area of depression was Problem Solving (i.e., teaching the client how to generate a variety of ideas and possible solutions to real problems in his or her life; $n = 94$ sessions; 19%), followed by Activity Selection (i.e., identifying and scheduling activities that will improve the child's mood; $n = 60$ sessions; 12%) and Cognitive BLUE (i.e., identifying unrealistic negative thoughts, evaluating the evidence that supports and does not support those negative thoughts, and generating more realistic thoughts; $n = 42$ sessions; 9%).

Of the 473 sessions with youths with a principal problem area of conduct, providers delivered a practice indicated for conduct in 300 sessions (63%), a practice indicated for a comorbid problem in 101 sessions (21%), and an "other" practice in 125 sessions (26%). The most frequently implemented practice for youths with a principal problem area of conduct was One-on-One Time (i.e., teaching the parent to establish a more positive interaction with his or her child through regular one-on-one time; $n = 60$ sessions; 13%), followed by Rewards (i.e., establishing a rewards program that encourages positive behavior; $n = 53$ sessions; 11%) and Learning About Behavior (i.e., teaching the parent about the factors related to disruptive behavior and the role of consequences in changing behaviors; $n = 48$ sessions; 10%).

To assess whether providers were addressing comorbid mental health problems all at once or intermittently throughout the therapeutic episode, the number of consecutive sessions targeting a comorbid problem area was examined. Providers delivered practices indicated for a comorbid problem area over an average of 2.14 consecutive sessions ($SD = 1.53$, $Mdn = 2$, range = 1–9). Practices related to comorbid anxiety were covered over an average of 1.31 consecutive sessions ($SD = .85$, $Mdn = 1$, range = 1–4), practices related to comorbid depression were covered over an average of 1.98 consecutive sessions ($SD = 1.18$, $Mdn = 2$,

range = 1–5), practices related to comorbid trauma were covered over an average of 2.40 consecutive sessions (*SD* = 1.52, *Mdn* = 2, range = 1–5), and practices related to comorbid conduct were covered over an average of 1.52 consecutive sessions (*SD* = 1.05, *Mdn* = 1, range = 1–6). The three most frequently implemented practices for addressing a comorbid problem area were Rewards (*n* = 36 sessions), Problem Solving (*n* = 33 sessions), and Learning to Relax (i.e., teaching the child how to stay calm and relax through deep breathing, deep muscle relaxation, and guided imagery; *n* = 21 sessions).

Predictors of Implementation

To determine whether providers were systematically addressing youths' comorbid mental health problems, two multilevel, logistic regression models were used to examine the relationship between youths' initial characteristics and treatment progress and providers' implementation of practices indicated for youths' principal and comorbid problem areas. Pretreatment Conduct Problems severity emerged as a significant predictor of providers' implementation of practices indicated for youths' principal problem area. Specifically, the expected odds of a provider targeting a youth's principal problem area increase by 1.06 times for each 1-point increase in pretreatment Conduct Problems severity ($b = .058$), $t(36.06) = 2.72$, $p < .05$. The effect of youths' time in therapy on implementation of practices indicated for youths' principal problem area was also significant, such that the expected odds of a provider targeting a youth's principal problem area decrease by 1.02 times for each additional month that a youth spends in therapy ($b = –.020$), $t(1215.37) = -4.73$, $p < .001$. No significant associations emerged between youths' type of principal problem, type of comorbid problem, age, gender, weekly principal problem TPA severity rating, or weekly comorbid problem TPA severity rating and providers' implementation practices indicated for youths' principal problem.

Youths' age, gender, and pretreatment Conduct Problems severity emerged as significant predictors of providers' implementation of practices indicated for a comorbid problem. Specifically, the odds of a provider targeting a comorbid problem increase by 1.03 times for each 1-year increase in age ($b = .025$), $t(37.74) = 2.55$, $p < .05$; are 1.12 times greater for boys than for girls ($b = .113$), $t(40.96) = 2.16$, $p < .05$; and decrease by 1.04 times for each 1-point increase in pretreatment Conduct Problems severity ($b = -.039$), $t(38.93) = -2.20$, $p < .05$. The effect of youths' time in therapy on implementation of practices indicated for a comorbid problem was also significant, such that the odds of a provider targeting a comorbid problem increase by 1.02 times for each additional month that a youth spends in therapy ($b = .021$), $t(1210.91) = 5.85$, $p < .001$. No significant associations emerged between youths' type of principal problem, type of comorbid problem, weekly principal problem TPA severity rating, or weekly comorbid problem TPA severity rating and providers' implementation of practices indicated for a comorbid problem. Table 3 summarizes the results of the multilevel models.

DISCUSSION

The current study examined community mental health providers' coordination of a modular EBT to address comorbid psychopathology in children and adolescents. By investigating

patterns and predictors of providers' practice implementation as they delivered a modular EBT to treat comorbid childhood mental health problems, we hoped to better understand the flexibility with which providers apply modular EBTs to manage treatment interferences as well as when, for how long, and to what extent do providers address comorbid mental health problems.

Although all of the youths in this study evidenced clinically elevated symptomatology in multiple problem areas, findings revealed that providers targeted youths' comorbid problems with only about half of their study cases. These results are consistent with research indicating that providers expand the breadth of their practice repertoire only in certain situations (e.g., when treating youths with two or more comorbid problems; Orimoto et al., 2014) and suggest that providers may not feel compelled to use ancillary EBTs to address comorbid symptomatology when treating youths with multiple problems. Indeed, given the promise that single-diagnosis and transdiagnostic EBTs have shown for treating multiple problem areas with a single protocol (e.g., Craske et al., 2007; Farchione et al., 2012; Norton & Philipp, 2008; Weisz et al., 2012), it may be that providers are not prompted to address certain clients' comorbid problem areas if they are evidencing improvement with treatment focused on a specific problem or set of symptoms.

Relatedly, results showed that providers spent the majority of sessions targeting youths' principal problem and delivered practices prescribed to treat youths' comorbid problems infrequently and with relatively little extensiveness. Unsurprisingly, this pattern of implementation is reflective of the principles of modular treatment design (Chorpita, Daleiden, et al., 2005), such that that providers appear to be addressing comorbid symptomatology by selecting and delivering specific therapy practices or even specific techniques within therapy practices—presumably based on the youth's or family's concerns or needs—as opposed to implementing entire treatment protocols for each presenting problem. Although providers in this study were expected to implement a modular EBT, such findings remain encouraging in that they suggest that providers are systematic in their adaptation decisions despite the flexibility allowed by the modular treatment.

In line with this notion that providers tend to prioritize youths' principal problem area during the implementation process, the most frequently implemented practices within each principal problem area featured behavioral skills for addressing that problem area (i.e., exposures for addressing anxiety, problem solving for addressing depression, and strategies for strengthening parent–child interactions for addressing conduct). Of interest, all of these practices were the first skills that providers would have taught to clients, following any engagement and psychoeducation practices, if they were adhering to the default sequences of practices featured in the MATCH-ADTC manual. Such findings are reassuring—not only in that they provide additional support for providers' frequent use of EBT practices (e.g., Palinkas et al., 2013; Park et al., 2015), but also in that they suggest that providers are adhering to the sequencing prescribed by the modular EBT (as a portion of youths prematurely terminated from treatment [Chorpita et al., 2016] and thus frequency of practice delivery is likely biased toward practices covered in the early stages of treatment).

In addition, results revealed that providers' most frequently implemented practices for addressing comorbidity were transdiagnostic in nature. That is, following the model of practice specification characteristic of traditional EBTs (Weisz & Chorpita, 2011), practices such as Problem Solving and Rewards were prescribed to treat a specific problem area by the MATCH-ADTC manual; however, the therapeutic techniques described in such practices can be relevant to multiple disorders or can address clinical concerns that transcend diagnostic boundaries (e.g., lack of motivation to participate in therapy). These findings converge with the literature on transdiagnostic treatments by highlighting the overlapping treatment processes among psychological disorders and thus have important implications for the design of treatment protocols, which have historically paired therapy practices with the treatment of a single disorder.

To determine the systematic nature of providers' decision to focus on youths' principal problem or comorbid problem, we examined whether youths' initial presentation and treatment progress predicted providers' implementation of EBT practices. Findings indicate that youths' pretreatment problem severity influenced providers' patterns of practice selection, such that providers were more likely to target youths' principal problem and less likely to target youths' comorbid problems as severity of conduct problems increased. In addition, providers were more likely to deliver practices indicated for youths' comorbid problems with older youths and with boys, perhaps because there are a wider variety of EBT practices that are appropriate for older youths (e.g., Grave & Blissett, 2004) and because boys' behaviors tend to be more overt while girls' behaviors tend to be more covert (Kann & Hanna, 2000). Consistent with the findings from Orimoto and colleagues (2014), youths' type of principal problem and type of comorbid problem did not predict providers' pattern of EBT implementation. Surprisingly, the current severity of youths' presenting problems also did not significantly influence providers' problem area focus. Yet, in line with our hypotheses, results showed that time in therapy predicted providers' implementation of practices indicated for youths' principal or comorbid problems and suggest that providers tend to attend to youths' principal problem at the beginning of their treatment episodes and then intermittently address youths' comorbid problems as treatment progresses. Taken together, these patterns of EBT implementation for addressing comorbid mental health problems indicate that providers may prioritize pretreatment data when making the decision of whether to target youths' comorbid problems and, if they choose to do so, appear to try to regulate youths' principal problem before starting to address any comorbid problems. As there are undoubtedly other factors besides a youth's initial presentation and time in therapy that influence a provider's decision to target the youth's comorbid problem in a given session, research should further investigate the reasoning behind providers' selection and sequencing of practices indicated for comorbid mental health problems.

Although this study has several strengths including the clinical diversity of the youth sample and its use of session-level data, which afforded a detailed examination of patterns of EBT implementation for comorbid childhood mental health problems, some caveats are in order. The first relates to the statistical power of the analyses. Given the exploratory nature of this study, we examined whether numerous variables predicted providers' implementation of practices indicated to treat youths' primary or comorbid problem areas. However, the large number of predictors included in each multilevel model in conjunction with the sample size

of 57 youths resulted in the analyses having low statistical power. Because the same patterns of findings were found in multilevel models estimated with fewer predictors (and, accordingly, with greater statistical power), we decided to report the multilevel models estimated with all of the variables on interest; yet it is possible that additional client characteristics or factors related to treatment progress may emerge as significant predictors if providers' EBT practice administration with youths with comorbid mental health problems is examined in studies with greater statistical power. The representativeness of the youth and caregiver study participants also presents a limitation of the current study. Despite providing valuable information about EBT implementation with underserved populations, study participants were predominantly low socioeconomic status, ethnic minority families, and thus these findings may not generalize to other mental health populations. Another limitation relates to the practice specification of the MATCH-ADTC manual also presents a limitation of the current study. As mentioned earlier, each practice from the MATCH-ADTC manual was designated to treat a specific problem area (i.e., anxiety, depression, trauma, or conduct); however, not only are several of the MATCH-ADTC practices appropriate for treating concerns related to other problem areas, but some are actually explicitly prescribed by the MATCH-ADTC manual to address related symptomatology (e.g., relaxation skills are included in both the depression and trauma protocol flowcharts). In particular, the majority of practices from the treatment protocol for traumatic stress are also featured in the treatment protocol for anxiety (cf. Chorpita & Weisz, 2009). As clinical presentations of anxiety were more prevalent in our sample than clinical presentations of traumatic stress, we considered these overlapping therapy practices to be associated with the treatment of anxiety problems and considered only those practices that were exclusive to the treatment protocol for traumatic stress to be associated with the treatment of trauma-related problems. Accordingly, results from this study may be an underrepresentation of providers' implementation of practices to address comorbid trauma (or, reflectively, an overrepresentation of providers' implementation of practices to address anxiety); yet, as practices related to comorbid anxiety and comorbid trauma were covered relatively infrequently, the overall patterns of EBT implementation found in this study are likely to still hold true. Relatedly, another limitation of this study concerns sessions' problem area focus. That is, the problem area focus of a given session was inferred based on the problem area that was assigned to the delivered practice; however, providers may have adapted practices to address concerns outside of their original designation as has been observed in providers' routine delivery of EBTs (Stirman et al., 2013). As such adaptations were not examined in the present study, an assumption was made that providers selected and delivered practices with the goal of treating the practices' indicated problem area. In addition, data informing youths' present principal problem severity and present comorbid problem severity were limited to caregiver-report ratings on a single measure. Given the reporting differences between younger and older youths and between youths and their caregivers as noted in the literature (Achenbach, McConaughy, & Howell, 1987), it is possible that the informant may influence providers' decisions to adapt their treatment plan in the face of worsening symptomatology. Alternatively, providers may be more attuned to changes in youths' functioning as opposed to problem severity or may look for trends in youths' treatment progress as opposed to a single data point when deciding whether to target a comorbid

problem. As these explanations are largely speculative, future research should investigate how youth- and family-input drive clinical decision making.

Conclusions

Despite these limitations, this study provides valuable insight into community mental health providers' implementation of EBT practices for youths presenting with comorbid symptomatology. The present findings lend support to the notion that providers tend to focus their course of treatment on youths' principal problem area and to systematically address any comorbid problems that may interfere with the course of treatment. In addition, findings suggest that flexible implementation is not a hallmark of modular EBTs but rather an option that providers can utilize or disregard as they make clinical decisions. Further research in this area is likely to unveil patterns of EBT use that can enhance the effectiveness of EBTs in community mental health settings and contribute to quality improvement efforts aiming to increase the public health impact of EBTs to reach the field's high expectations.

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TABLE 1

Composition of Youths' Principal and Comorbid Problems

Comorbid Problem Area	*Principal Problem Area*		
	Anxiety[a]	***Depression***[b]	***Conduct***[c]
Anxiety	—	16 (89%)	29 (79%)
Depression	11 (73%)	—	13 (54%)
Conduct	9 (60%)	14 (78%)	—
Trauma	2 (13%)	1 (6%)	3 (13%)

[a] $n = 15$.

[b] $n = 18$.

[c] $n = 24$.

TABLE 2

The Proportion of Sessions in Which Anxiety, Depression, Conduct, Trauma, and/or "Other" Practices Were Covered by Principal Problem Area

	Anxiety[a]		*Depression*[b]		*Conduct*[c]		*Total*[d]	
Type of Practice	***Covered Full***	***Covered Part or Full***	***Covered Full***	***Covered Part or Full***	***Covered Full***	***Covered Part or Full***	***Covered Full***	***Covered Part or Full***
Anxiety	110 (34%)	253 (79%)	2 (0%)	9 (2%)	2 (0%)	8 (2%)	114 (9%)	270 (21%)
Getting Acquainted—Anxiety	13 (4%)	20 (6%)	0 (0%)	1 (0%)	1 (0%)	3 (1%)	14 (1%)	24 (2%)
Fear Ladder	11 (3%)	51 (16%)	0 (0%)	5 (1%)	0 (0%)	2 (0%)	11 (1%)	58 (5%)
Learning About Anxiety—Child	4 (1%)	50 (16%)	1 (0%)	1 (0%)	1 (0%)	3 (1%)	6 (0%)	54 (4%)
Learning About Anxiety— Parent	7 (2%)	22 (7%)	1 (0%)	2 (0%)	0 (0%)	0 (0%)	8 (1%)	24 (2%)
Practicing	63 (20%)	98 (31%)	0 (0%)	1 (0%)	0 (0%)	0 (0%)	63 (5%)	99 (88%)
Maintenance	4 (1%)	10 (3%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	4 (0%)	10 (1%)
Cognitive: STOP	4 (1%)	35 (11%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	4 (0%)	35 (3%)
Wrap Up	6 (2%)	8 (3%)	0 (0%)	1 (0%)	0 (0%)	0 (0%)	6 (0%)	9 (1%)
Depression	6 (2%)	27 (8%)	155 (32%)	347 (71%)	38 (8%)	90 (19%)	199 (15%)	464 (36%)
Getting Acquainted—Depression	0 (0%)	1 (0%)	16 (3%)	29 (6%)	4 (1%)	10 (2%)	20 (2%)	40 (3%)
Learning About Depression—Child	0 (0%)	1 (0%)	10 (2%)	39 (8%)	5 (1%)	13 (3%)	15 (1%)	53 (4%)
Learning About Depression—Parent	0 (0%)	0 (0%)	12 (2%)	27 (5%)	0 (0%)	0 (0%)	12 (1%)	27 (2%)
Problem Solving	4 (1%)	10 (3%)	44 (9%)	94 (19%)	12 (3%)	23 (5%)	60 (5%)	127 (10%)
Activity Selection	1 (0%)	6 (2%)	26 (5%)	60 (12%)	2 (0%)	7 (1%)	29 (2%)	73 (6%)
Learning to Relax	1 (0%)	6 (2%)	14 (3%)	31 (6%)	4 (1%)	15 (3%)	19 (1%)	52 (4%)
Quick Calming	0 (0%)	1 (0%)	9 (2%)	21 (4%)	6 (1%)	15 (3%)	15 (1%)	37 (3%)
Presenting a Positive Self	0 (0%)	0 (0%)	2 (0%)	12 (2%)	1 (0%)	2 (0%)	3 (0%)	14 (1%)
Cognitive: BLUE	0 (0%)	2 (1%)	10 (2%)	42 (9%)	1 (0%)	10 (2%)	11 (1%)	54 (4%)
Cognitive: TLC	0 (0%)	0 (0%)	9 (2%)	16 (3%)	2 (0%)	5 (1%)	11 (1%)	21 (2%)
Plans for Coping	0 (0%)	0 (0%)	8 (2%)	17 (3%)	1 (0%)	1 (0%)	9 (1%)	18 (1%)
Wrap Up	0 (0%)	0 (0%)	5 (1%)	9 (2%)	2 (0%)	4 (1%)	7 (1%)	13 (1%)
Conduct	1 (0%)	16 (5%)	17 (3%)	89 (18%)	126 (27%)	300 (63%)	144 (11%)	405 (32%)
Engaging Parents	0 (0%)	1 (0%)	1 (0%)	4 (1%)	25 (5%)	46 (10%)	26 (2%)	51 (4%)
Learning About Behavior	0 (0%)	0 (0%)	1 (0%)	12 (2%)	13 (3%)	48 (10%)	14 (1%)	60 (5%)
One-on-One Time	0 (0%)	0 (0%)	2 (0%)	14 (3%)	23 (5%)	60 (13%)	25 (2%)	74 (6%)
Praise	0 (0%)	0 (0%)	5 (1%)	14 (3%)	12 (3%)	33 (7%)	17 (1%)	47 (4%)

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	Anxiety[a]		*Depression*[b]		*Conduct*[c]		*Total*[d]	
Type of Practice	***Covered Full***	***Covered Part or Full***	***Covered Full***	***Covered Part or Full***	***Covered Full***	***Covered Part or Full***	***Covered Full***	***Covered Part or Full***
Active Ignoring	0 (0%)	4 (1%)	2 (0%)	6 (1%)	10 (2%)	32 (7%)	12 (1%)	42 (3%)
Giving Effective Instructions	0 (0%)	0 (0%)	0 (0%)	15 (3%)	7 (1%)	20 (4%)	7 (1%)	35 (3%)
Rewards	0 (0%)	8 (3%)	5 (1%)	28 (6%)	13 (3%)	53 (11%)	19 (1%)	89 (7%)
Time Out	1 (0%)	4 (1%)	0 (0%)	2 (0%)	8 (2%)	19 (4%)	8 (1%)	25 (2%)
Making a Plan	0 (0%)	0 (0%)	1 (0%)	8 (2%)	5 (1%)	14 (3%)	6 (0%)	22 (2%)
Daily Report Card	0 (0%)	0 (0%)	0 (0%)	3 (1%)	13 (3%)	43 (9%)	13 (1%)	46 (4%)
Looking Ahead	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0%)	6 (1%)	1 (0%)	6 (0%)
Booster	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (0%)	1 (0%)	1 (0%)	1 (0%)
Trauma	2 (1%)	9 (3%)	0 (0%)	0 (0%)	1 (0%)	3 (1%)	3 (0%)	12 (1%)
Safety Planning	2 (1%)	2 (1%)	0 (0%)	0 (0%)	1 (0%)	1 (0%)	3 (0%)	3 (0%)
Trauma Narrative	0 (0%)	7 (2%)	0 (0%)	0 (0%)	0 (0%)	2 (0%)	0 (0%)	9 (1%)
Other	38 (12%)	52 (16%)	85 (20%)	110 (22%)	94 (20%)	125 (26%)	217 (17%)	287 (22%)

[a] $n = 319$.

[b] $n = 492$.

[c] $n = 473$.

[d] $n = 1{,}284$.

TABLE 3

Results From Logistic Regression Analysis

	Principal Problem Practice Implementation				*Comorbid Problem Practice Implementation*			
Predictor	***Estimate***	***SE***	**OR**	**p**	***Estimate***	***SE***	**OR**	**p**
Principal Problem (Anxiety)	.228	.137	1.256	.105	−.175	.115	.839	.135
Principal Problem (Depression)	.192	.106	1.212	.080	−.109	.089	.897	.228
Comorbid Problem of Anxiety	−.058	.099	.944	.565	−.031	.083	.969	.711
Comorbid Problem of Depression	−.006	.083	.994	.945	−.041	.069	.960	.561
Comorbid Problem of Traumatic Stress	−.178	.099	.837	.081	.099	.082	1.104	.239
Comorbid Problem of Conduct	−.090	.087	.914	.307	.050	.073	1.051	.495
Age	−.023	.012	.977	.054	.025	.010	1.025	.015*
Gender (Boy)	−.092	.063	.912	.152	.113	.052	1.120	.037*
Pretreatment Emotional Symptoms Score	−.017	.015	.983	.257	.011	.013	1.011	.409
Pretreatment Conduct Problems Score	.058	.021	1.060	.010*	−.039	.018	.962	.034*
Pretreatment Hyperactivity-Inattention Score	−.006	.013	.994	.672	.015	.011	1.015	.197
Pretreatment PEER Problems Score	−.029	.016	.971	.080	.027	.013	1.027	.054
Weekly Principal Problem TPA Rating	−.008	.008	.992	.303	.008	.007	1.008	.230
Average Client Principal Problem TPA Rating	−.024	.015	.976	.116	.011	.013	1.011	.369
Weekly Comorbid Problem TPA Rating	−.010	.008	.990	.200	−.010	.007	.990	.142
Average Client Comorbid Problem TPA Rating	.022	.016	1.022	.176	−.027	.013	.973	.051
Time in Therapy (in Months)	−.020	.004	.980	< .001**	.021	.004	1.021	< .001**
Termination Status (Routine Termination)	.020	.068	1.020	.773	.043	.057	1.044	.458

Note: SE = standard error; *OR* = odds ratio; TPA = Top Problems Assessment for Caregivers.

*$p < .05$.

**$p < .001$.