

# Community-Based Treatment for Youth with Co- and Multimorbid Disruptive Behavior Disorders

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**Abstract** Little is known about the types of psychotherapeutic practices delivered to youth with comorbid and multimorbid diagnoses in community settings. The present study, based on therapists' self-reported practices with 569 youth diagnosed with a disruptive behavior disorder (ODD or CD), examined whether specific therapeutic practice applications varied as a function of the number and type of comorbid disorders. While type of comorbid disorder (AD/HD or internalizing) did not predict therapists' practices, youth with more than two diagnoses (multimorbid) received treatment characterized by a more diverse set and a higher dosage of practices.

**Keywords** Disruptive behavior disorders · Comorbidity · Treatment as usual · Usual care · Treatment practices · Youth · Multimorbidity

## Introduction

Disruptive behavior disorders (DBD), specifically oppositional defiant disorder (ODD) and conduct disorder (CD) are among the most prevalent childhood disorders served in mental health clinics (Frick 1998; Kazdin 1995). Youth with DBD are of great concern, as they account for approximately 30 % of the youth client population, often show high levels of impairment (Lahey et al. 1999), and incur sizeable

societal costs (e.g., harm to others, incarceration, mental health services; Scott et al. 2001).

Fortunately, various treatment methods have been shown to lessen symptoms and improve longer-term outcomes (e.g., Becker et al. 2011; Weisz et al. 2006). A recent analysis of 175 randomized-controlled trials for DBD interventions found “best support” for certain treatment types or categories, primarily characterized by parent management training and youth skill building (Becker et al. 2011; Webster-Stratton and Hammond 1997). These programs were comprised of common therapeutic practices (or practice elements; PE), for example, praise, time out, tangible rewards, problem solving, cognitive skill development, and social skill training techniques (Chorpita and Daleiden 2009). As one might logically expect, there was significant overlap between the evidence-based practice profiles for DBDs and other externalizing disorders such as Attention-Deficit Hyperactivity Disorder (ADHD; e.g., praise, problem solving, and psychoeducation for the parent), but considerable divergence between the profiles for DBDs and internalizing disorders (e.g., anxiety and depression; Chorpita and Daleiden 2009; Evidence Based Services Committee 2009).

The fact that the common element content of evidence-based treatment manuals differs across disorders brings into question how these approaches should be implemented in community settings, particularly for youth with comorbid problems. There is considerable research indicating that youth with DBDs often meet criteria for one or more additional disorders (over 80 %; Greene et al. 2002) and the rates of comorbidity for youth referred to community services are quite high (approximately 70 %; e.g., Mueller et al. 2010). “Comorbidity” is the term that is most consistently used to describe this phenomenon, but “multimorbidity,” the occurrence of more than two diagnoses, also occurs (Krueger and Bezdjian 2009). Given the long-

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standing finding of two global dimensions of child and adolescent mental health symptoms (externalizing and internalizing; Achenbach 1992), comorbidity is often examined in the context of the four broad disorder categories of youth mental health (disruptive behavior, anxiety, attentional and depression). It should be noted that although comorbidity is not restricted to these four groups, these diagnoses characterize the most common problems served in community youth mental health settings (e.g., Keir et al. 2011).

Treatment for youth with two or more disorders might be more complex than treatment for one disorder. Usual care providers interested in applying evidence-based techniques, are faced with the ongoing challenge of how to do so with their multiply diagnosed clients and with little guidance from the research. In part, this might explain why evidence-based services are not widely utilized by practitioners working with youth (Hoagwood and Olin 2002; Perkins et al. 2007; Weiss et al. 1999; Weisz et al. 2006; Weisz et al. 1992), who often view such treatments as rigid and incompatible with their complex cases (e.g., Addis and Krasnow 2000; Bortrager et al. 2009; Nelson et al. 2006). High rates of clients with multiple disorders might contribute to community therapists' preferences for combining techniques from several theoretical orientations (e.g., Baumann et al. 2006).

The relationship between co- and multimorbidity to treatment response remains largely unclear. Several reviews across childhood disorders support the hypothesis that comorbidity has a negative impact on client progress (e.g. Jensen et al. 1997; Kazdin and Crowley 1997; MTA Cooperative Group 1999). On the other hand, more recent studies with similar populations have found that both co- and multimorbidity are unrelated to outcomes (Costin and Chambers 2007; Jensen Doss and Weisz 2006; Kazdin and Whitley 2006; Mueller et al. 2010; Ollendick et al. 2008), but might be linked to post-treatment relapse (Crawley et al. 2008; Rohde et al. 2001).

If type and number of diagnoses do not hinder positive outcomes, perhaps it is because treatments for youth with multiple diagnoses differ just enough from those for youth with a pure diagnosis so that they are able to achieve similar gains. For example, therapists might employ a greater number of unique or different psychotherapeutic practices (defined herein as "diversity" of practices) in order to utilize a broader range of recommended evidence-based approaches, each specific to a given diagnosis. Similarly, therapists might choose to apply certain techniques with more intensity, duration, frequency or focus with co- and multimorbid clients (i.e., dosage of practices). These practice variations might be particularly pronounced in community mental health settings, where youth often remain in treatment until they show improvement or age

out of the system (e.g., Keir et al. 2011). Only one evidence-based program thus far has been developed to specifically focus on youth with multiple diagnoses (Modular Cognitive-Behavioral Therapy; Chorpita and Weisz 2009).

A preliminary step in understanding therapists' treatment approaches for such clients is to accurately and efficiently identify the strategies that providers currently apply. In order to examine the nuanced gradations of common therapeutic practices, researchers are now examining treatments at the technique or PE level (e.g., parent praise; Chorpita and Daleiden 2009; Chorpita et al. 2005; Garland et al. 2008; Garland et al. 2006; McLeod and Weisz 2010; Weersing et al. 2002) instead of at the theoretical orientation (e.g., cognitive-behavioral) or program level (e.g., Defiant Children; Barkley 1997). Recent studies indicate that training in such methods are practical, acceptable to therapists and improve attitudes toward evidence-based services (Bortrager et al. 2009).

Current research within the aforementioned framework has begun to illuminate patterns in community clinicians' specific treatment practices. First, community therapists treating disruptive behavior problems tend to apply considerable diversity (or breadth) of therapeutic practices (evidence-based and non-evidence-based) at relatively low intensity (Garland et al. 2010), particularly in the event of a crisis (Kelley et al. 2010). Second, therapists employ different types and doses of techniques based on characteristics of the child (e.g., age, gender, primary diagnosis and level of functional impairment; Walker et al. 2008; Weersing et al. 2002; Orimoto et al. 2012), caregiver (e.g., educational level, alcohol use), clinician (e.g., theoretical orientation; Brookman-Frazer et al. 2009) and treatment (e.g., length of service; Kelley et al. 2010). Third, factor analysis has indicated that community therapists' specific practices tend to group into three major categories (Orimoto et al. 2012). The first set of practices reflects mostly behavioral interventions disproportionately applied by unlicensed clinicians with younger, highly impaired, and inattentive clients, the second set of practices are related to coping and self-control and utilized more by licensed therapists, and the final set of practices are characterized by family interventions, more often employed with youth with high severity (Orimoto et al. 2012).

The extent to which type and number of diagnoses influence the diversity (breadth) and dosage (total application of distinct practices) of PEs remains unknown. Additional disorders might force community therapists to use more and more diverse practices, possibly accounting for their frequent self-description as "eclectic" (Norcross et al. 2005). In addition, the exact nature of youths' comorbid diagnoses might affect diversity and dosage. Given that evidence-based treatments for internalizing and externalizing disorders are quite different, therapists might

engage in more diverse treatment for youth with comorbid conditions that fall within both the internalizing (e.g. depression and anxiety) and externalizing (e.g. ADHD and oppositional defiant disorder) disorders (e.g. Barlow et al. 2004). It is also possible that specific types of comorbidity might differentially influence the use of behavioral, coping/self-control and family practices (e.g. high use of behavioral and coping/self-control) for youth with a depression and conduct disorder.

The current study aims to answer several questions regarding treatment for youth with a single versus co- or multimorbid (i.e., anxiety, mood, or attentional disorder) DBD diagnosis. First, do community therapists in the Hawai'i system of care use a more diverse set and a greater dosage of practices as a function of number of diagnoses? Second, does type of comorbid diagnosis (attentional, mood, anxiety) influence the diversity (breadth) and dosage (average monthly frequency of particular PEs employed) of PEs used with youth with a DBD? Third, if there are differences due to co- or multimorbidity, which specific practices seem to change? The empirical literature points to PE differences in empirically-supported packages across disorders. Given that the community mental health system under study has committed to evidence-based practices and procedures (Nakamura et al. 2011), we hypothesize that there will be an overall effect for therapists' reported diversity and dosage of practices as a function of type of comorbidity. Youth with comorbid ADHD might receive more behavioral management practices while clients with an additional internalizing disorder might be more likely to receive coping and self-control techniques. In addition, we hypothesize that youth with multimorbid DBD diagnoses will receive a significantly greater diversity and dosage of PEs than youth with a single or comorbid DBD.

## Method

### System of Care

In the state of Hawai'i system of care, mental health services are provided to youth and families through the Department of Education's (DOE) school-based programs and an additional array of intensive services contracted by the Department of Health (DOH) Child and Adolescent Mental Health Division (CAMHD 2006). The CAMHD is equipped to provide therapy at multiple levels of care, including outpatient intensive in-home, community-based foster homes, group homes, residential treatment facilities and emergency services. The least restrictive service, intensive in-home, is a non-manualized treatment delivered to youth and their families, designed to improve families' abilities to stabilize youths' functioning in their current

environments (CAMHD 2006). Currently, CAMHD has contracted eight private agencies across the state to provide intensive in-home therapy. Individuals offering treatment within these agencies consist of licensed professionals, unlicensed professionals, and paraprofessionals with varying educational backgrounds and professional specialties (CAMHD 2006).

Upon system entry, each youth is assigned to a care coordinator at one of the five regional family guidance centers. Care coordinators are charged with the management, planning, and monitoring of client services and work intimately with families to review treatment progress across several client domains (individual, family, community, school, and peer; CAMHD 2006).

### Participants

Participants ( $N = 569$ ) in the current study consisted of youth who were diagnosed with any DBD (i.e. ODD, CD, or DBD NOS) and received intensive in-home services through the statewide system of care. Diagnoses were determined via annual assessments based on the Diagnostic and Statistical Manual of Mental Disorders, 4th edition, text revised (American Psychiatric Association 2000; CAMHD 2006). Contracted providers completed these mental health evaluations, utilizing data collected in semi/structured clinical interviews and parent and child measures of general behavior problems (CAMHD 2006). For the purpose of this project, youth diagnostic profiles were derived from the annual assessments completed closest to the service episode start date. Only clients who were newly admitted into the intensive in-home level of care between July 1, 2003 and June 30, 2010 and were provided a minimum treatment episode length of 30 days ( $M = 228.00$ ,  $SD = 208.23$ ) were included in the analyses. Length of treatment was defined as the difference between ending and starting dates of service, based on data from CAMHD's electronic records system.

Participants reflected the general pattern of youth receiving intensive in-home services in this system of care (Keir et al. 2011). The sample was ethnically diverse, approximately 60 % male, had an average age of 13.09 years ( $SD = 3.48$ ) and included youth with (a) DBD only ( $n = 165$ ), (b) DBD and one additional disorder (comorbid,  $n = 279$ ), (c) DBD and two additional disorders (multimorbid,  $n = 125$ ; Table 1). Of the youth with multimorbidity, 40 % had at least one anxiety disorder, 70 % had at least one mood disorder, and 82 % had at least one attentional disorder. In order to directly compare therapy practices for those with pure DBD and those with a single common comorbid disorder, the sample was reduced to  $N = 444$ , eliminating all multimorbid youth and including only DBD youth with one of three common

disorder categories. This smaller sample included three subgroups: the original DBD only ( $n = 165$ ), DBD and a single internalizing disorder ( $n = 115$ ; approximately 30 % anxiety and 70 % mood), and DBD and ADHD ( $n = 164$ ; Table 1).

## Measures

### *Monthly Treatment and Progress Summary (MTPS; CAMHD 2003, 2005 revision)*

The MTPS is a case-based clinician-report form designed to assess service format, setting, treatment targets, PEs, and client outcomes. The Intervention Strategies (i.e., PEs) portion of the MTPS was developed collaboratively with stakeholders in the local system of care, following a review of selected evidence-based treatment manuals and discussions with local practitioners, intervention developers, and researchers (Orimoto et al. 2012). Therapists are instructed to indicate all specific PEs from 63 predefined techniques (up to three additional write-ins) utilized in treatment during the preceding month and submit an online MTPS for every client on a monthly basis. PEs have demonstrated good reliability and validity (e.g., Chorpita et al. 2005; Daleiden et al. 2004) and have been found to organize into three factors: behavioral management, 15 PEs; cognitive/self-coping, 19 PEs; family interventions, 13 PEs; Orimoto et al. 2012).

Since July 1, 2006, MTPS submission has become a mandatory requirement for reimbursement (Nakamura et al. 2007). Throughout the proposed data collection period, CAMHD provided statewide trainings on the MTPS and offered online access to rater instructions and item definitions. Recent CAMHD annual evaluations have indicated that MTPS completion rates are nearly 100 % (Keir et al. 2011).

### *Child and Adolescent Functional Assessment Scale (CAFAS; Hodges 1990, 1994 revision)*

CAFAS scores closest to the start of service episodes were used as a covariate in analyses. The CAFAS is a 200-item measure that assesses youth functional impairment across eight domains. A public service care coordinator assigned a score on each subscale, based on the severity of behavior problems within each domain. These scores were summed to create a total CAFAS score ranging from zero to 240, with higher scores indicating greater overall impairment. The CAFAS has demonstrated acceptable internal consistency, interrater reliability, stability across time, and concurrent validity and is sensitive to treatment change (Hodges and Gust 1995; Hodges and Wong 1996; Mueller et al. 2010; Nakamura et al. 2007).

## Data Analytic Strategy

### *Number of Diagnoses*

In order to thoroughly examine the diversity of PEs endorsed across treatment episodes, an overall composite variable (diversity total) and three additional composite variables based on the three-factor structure of the MTPS PEs were calculated (behavior management (factor 1), cognitive/self-coping (factor 2), family intervention (factor 3); Orimoto et al. 2012). These variables were computed by summing the number of unique PEs that had been utilized at least once over the course of each client's completed treatment episode (within each factor and overall). Values were then divided by the total number of PEs on those factors (15 for factor 1 or behavioral management, 19 for factor 2 or cognitive/self-coping and 13 for factor 3 or family interventions, respectively) or overall (63 for diversity total) to create proportion scores (range = 0–1). For example, if a youth client received three of the fifteen PEs on factor 1, he or she would receive a score of .20 for the diversity factor 1 variable. Higher diversity scores indicate the use of more distinct specific practices during the treatment episode.

Dosage scores for factors 1, 2, and 3 were similarly calculated by summing the total number of times that any PE within a factor were endorsed, and dividing the values by the total number of MTPSs to create a proportion score. For example, if a youth received 3 of the 15 PEs on factor 1 every month for the entire length of treatment (20 MTPSs) the youth would receive a dosage score of  $(3 \times 20)/20$  or 3 for factor 1. A total dosage variable was also created, which reflected the sum of all MTPS PEs applied, divided by number of MTPSs. Thus, dosage scores could range from 0 to 15 for dosage factor 1, 0–19 for dosage factor 2, 0–13 for dosage factor 3, and 0–63 for dosage total. PEs on each of the three factors are listed in Table 2. In sum, dosage reflects the average number of practices applied per month and roughly indicates how many total practice strategies were attempted per month.

Relevant covariates were identified via significant Pearson and point-biserial correlations between each of the diversity and dosage variables and client variables including age, gender, length of treatment episode and CAFAS total score at system entry. This method of determining covariates was based on the theoretical assumption that if the potential covariates were unrelated to the dependent variable, then they should not be included in the final statistical procedure. A general linear model (GLM) approach with categorical (gender; level of comorbidity) and continuous predictors (age, episode length)<sup>1</sup> was utilized to determine

<sup>1</sup> Total CAFAS scores were examined as potential covariates for both study questions. However, they were not significantly related to diversity and dosage scores, length of treatment episode, client age, or

**Table 1** Youth participant demographics (*N* = 569)

Characteristic	DBD only <i>n</i> = 165		DBD and one other disorder <i>n</i> = 279		DBD and two other disorders <i>n</i> = 125		DBD and an attentional disorder <i>n</i> = 164		DBD and an internalizing disorder <i>n</i> = 115	
	<i>n</i>	%	<i>n</i>	%	<i>N</i>	%	<i>n</i>	%	<i>n</i>	%
Age	<i>M</i> = 13.51 ( <i>SD</i> = 3.56)		<i>M</i> = 12.84 ( <i>SD</i> = 3.42)		<i>M</i> = 12.74 ( <i>SD</i> = 3.22)		<i>M</i> = 12.06 ( <i>SD</i> = 3.53)		<i>M</i> = 13.94 ( <i>SD</i> = 2.93)	
Gender										
Female	54	33	89	32	40	32	37	23	52	45
Male	111	67	190	68	85	68	127	77	63	55
Ethnicity										
Multiracial	17	10	33	12	18	14	18	11	15	13
Caucasian	8	5	13	5	8	6	9	5	4	3
Native Hawaiian/Pacific Islander	8	5	13	5	9	7	8	5	5	4
Asian	6	4	9	3	6	5	5	3	5	4
African American	4	2	0	0	1	1	1	0.6	0	0
Other	1	1	2	1	1	1	2	1	0	0
American Indian/Alaska Native	1	1	0	0	0	0	0	0	0	0
Hispanic/Latino American	0	0	2	1	2	2	1	0.6	1	1
Not available	121	73	205	74	80	64	120	73	85	74
Length of treatment episode in days	<i>M</i> = 205.84 ( <i>SD</i> = 192.02)		<i>M</i> = 241.11 ( <i>SD</i> = 216.51)		<i>M</i> = 253.86 ( <i>SD</i> = 178.93)		<i>M</i> = 249.03 ( <i>SD</i> = 238.73)		<i>M</i> = 229.82 ( <i>SD</i> = 180.57)	
CAFAS total at treatment start	<i>M</i> = 82.14 ( <i>SD</i> = 36.62)		<i>M</i> = 83.13 ( <i>SD</i> = 30.42)		<i>M</i> = 94.17 ( <i>SD</i> = 24.29)		<i>M</i> = 82.00 ( <i>SD</i> = 30.69)		<i>M</i> = 87.14 ( <i>SD</i> = 31.47)	

*DBD* disruptive behavior disorder, *CAFAS* Child and Adolescent Functional Assessment Scale, *Internalizing disorder* = Mood or anxiety disorder, *DBD* Only group remains the same for all later analyses

**Table 2** Percent of cases receiving practice elements at least once in a completed treatment episode

	DBD only <i>n</i> = 165	DBD and one other disorder <i>n</i> = 279	DBD and two other disorders <i>n</i> = 125	DBD and an attentional disorder <i>n</i> = 164	DBD and an internalizing disorder <i>n</i> = 115
Factor 1: behavior management					
Activity scheduling	50	49	58	51	45
Communication skills <sup>a</sup>	75	78	85	81	74
Family engagement	68	75	74	80	69
Ignoring or DRO	16	19	23	13	10
Line of sight supervision <sup>b</sup>	19	22	29	23	19
Modeling	50	56	60	60	50
Parent monitoring <sup>b</sup>	54	54	68	54	53
Parent praise <sup>a,b</sup>	55	63	74	65	60
Peer modeling or pairing <sup>a</sup>	15	13	20	15	9
Response cost	12	15	20	17	13
Skill building	64	64	63	63	66
Social skills training <sup>a</sup>	52	60	66	63	57
Tangible rewards <sup>b</sup>	36	45	52	52	35
Therapist praise or rewards <sup>b</sup>	58	66	76	66	65
Time out	15	19	22	23	15
Factor 2: coping/self-control					
Assertiveness training <sup>c</sup>	24	22	38	24	20
Cognitive or coping <sup>b</sup>	75	72	85	71	72
Commands or limit setting <sup>a</sup>	47	55	65	60	58
Emotional processing <sup>b</sup>	68	70	83	68	72
Exposure <sup>c</sup>	7	15	25	16	14
Insight building <sup>a,b</sup>	55	61	69	59	63
Maintenance or relapse prevention <sup>a</sup>	15	21	25	18	25
Mentoring <sup>b</sup>	34	36	47	39	31
Mindfulness	30	24	30	25	22
Motivational interviewing <sup>a</sup>	37	35	38	38	32
Peer modeling or pairing <sup>a</sup>	15	13	20	15	9
Problem solving <sup>a</sup>	76	76	82	77	74
Relaxation <sup>c</sup>	28	30	48	31	30
Response prevention <sup>b</sup>	11	15	22	14	17
Self monitoring <sup>b</sup>	40	41	54	42	39
Self reward or self praise	29	33	34	34	32
Social skills training <sup>a</sup>	52	60	66	63	57
Stimulus/antecedent control <sup>b</sup>	18	18	31	18	18
Supportive listening or client centered <sup>b</sup>	73	81	88	82	80
Factor 3: family interventions					
Commands or limit setting <sup>a,b</sup>	47	55	65	60	58
Communication skills <sup>a</sup>	75	78	85	81	74
Family therapy <sup>b</sup>	71	76	83	76	77
Functional analysis	7	10	18	13	6
Insight building <sup>a,b</sup>	55	61	69	59	63
Maintenance or relapse prevention <sup>a</sup>	15	21	25	18	25
Marital therapy	5	9	10	12	4
Motivational interviewing <sup>a</sup>	37	35	38	38	32
Natural and logical consequences	68	73	79	77	69

**Table 2** continued

	DBD only <i>n</i> = 165	DBD and one other disorder <i>n</i> = 279	DBD and two other disorders <i>n</i> = 125	DBD and an attentional disorder <i>n</i> = 164	DBD and an internalizing disorder <i>n</i> = 115
Parent praise <sup>a,b</sup>	55	63	74	65	60
Problem solving <sup>a</sup>	76	76	82	77	74
Psychoeducational-child	55	55	62	51	60
Psychoeducational-parent	61	66	70	66	64
Non-specific practice elements					
Attending	19	19	23	23	14
Behavior management	1	1	1	2	0
Biofeedback or neurofeedback	2	3	2	4	2
Care coordination	14	31	20	13	14
Catharsis <sup>b</sup>	4	7	13	7	8
Crisis management <sup>c</sup>	41	43	63	44	43
Cultural training	1	3	2	3	3
Directed play	15	24	19	27	18
Discrete trial training	0	0	0	0	0
Educational support	56	57	64	58	57
Eye movement or tapping	0	1	2	2	0
Free association	2	4	3	5	2
Goal setting	27	22	20	24	20
Guided imagery <sup>b</sup>	6	8	14	7	10
Hypnosis	1	3	2	3	2
Individual therapy for caregiver	13	12	16	24	12
Interpretation	13	19	21	24	12
Medication or pharmacotherapy <sup>c</sup>	10	23	32	26	18
Milieu	5	8	10	7	10
Parent coping <sup>c</sup>	70	77	89	80	73
Personal safety skills	11	10	10	13	6
Physical exercise	0	0	0	0	0
Relationship or rapport building	76	81	80	81	81
Thought field therapy	1	3	2	5	1
Twelve step programming	4	3	1	4	3

DBD disruptive behavior disorder, *Internalizing disorder* = Mood or anxiety disorder

Total factor scores include all factor 1, 2, and 3 and non-specific practice elements

The DBD Only group remains the same for all later analyses

<sup>a</sup> Practice element appears on more than one factor, since elements were allowed to cross-load

<sup>b</sup> Practice was more likely to be employed with multimorbid youth than pure or comorbid youth, when not controlling for cumulative alpha

<sup>c</sup> Practice was more likely to be employed with multimorbid youth than pure or comorbid youth, even after controlling for cumulative alpha via the Holm modified Bonferroni procedure

between group differences on all diversity and dosage scores as a function of comorbidity status. Next as an exploratory step,  $\chi^2$  values were calculated to determine if specific PE endorsement (yes or no, at any time during the treatment episode) differed as a function of diagnostic

category (multimorbid or pure/comorbid). Given the large number of  $\chi^2$  analyses, a modified Bonferroni procedure, as described by Holm (1979) was applied to both minimize the risk of Type I error and take into account Type II error rates. Final results report PE-related  $\chi^2$ s that were significant both with and without the modified Bonferroni correction, in an effort to balance the investigative nature of this study with the likelihood of cumulative Type I error. Table 2 provides information about the percent of cases that received each of

Footnote 1 continued

client gender. As a result, total CAFAS score was not considered as a theoretically relevant covariate and was not included in any GLM analyses.

**Table 3** Means and standard deviations for all practice element diversity and dosage scores as a function of number of diagnoses ( $N = 569$ )

Source	DBD only $n = 165$		DBD and one other disorder $n = 279$		DBD and two other disorders $n = 125$	
	$M$	SD	$M$	SD	$M$	SD
Diversity total**	0.32 <sup>a</sup>	0.15	0.34 <sup>a</sup>	0.16	0.40 <sup>b</sup>	0.15
Diversity factor 1*	0.42 <sup>a</sup>	0.24	0.47 <sup>a</sup>	0.24	0.53 <sup>b</sup>	0.22
Diversity factor 2**	0.39 <sup>a</sup>	0.21	0.41 <sup>a</sup>	0.22	0.50 <sup>b</sup>	0.21
Diversity factor 3**	0.48 <sup>a</sup>	0.20	0.52 <sup>a</sup>	0.22	0.58 <sup>b</sup>	0.20
Dosage total**	11.04 <sup>a</sup>	5.69	11.73 <sup>a</sup>	6.91	14.11 <sup>b</sup>	7.51
Dosage factor 1	3.50 <sup>a</sup>	2.39	3.80 <sup>a</sup>	2.53	4.34 <sup>a</sup>	2.55
Dosage factor 2**	4.14 <sup>a</sup>	2.41	4.26 <sup>a</sup>	2.93	5.49 <sup>b</sup>	3.30
Dosage factor 3**	3.80 <sup>a</sup>	1.95	4.06 <sup>a</sup>	2.24	4.75 <sup>b</sup>	2.40

*Internalizing disorder* = Mood or anxiety disorder

Diversity total, factors 1, 2, and 3 score range: 0–1

Dosage total range: 0–51

Dosage factor 1 range: 0–15

Dosage factor 2 range: 0–19

Dosage factor 3 range: 0–13

Means that do not share superscript “a” differ in the Bonferroni post hoc comparison

Means with different subscripts differ using Bonferroni post hoc comparison

\*  $P < .05$ , \*\*  $P < .01$

the PEs included in the analyses (at least once within a completed treatment episode) and indicates which specific PEs were significantly more likely to be applied with multimorbid youth than pure/comorbid youth.

### Type of Comorbidity

The foregoing procedures were repeated on the eight measures of diversity and dosage to determine whether PE application differed as a function of comorbidity status (AD/HD or internalizing). A series of GLM analyses with categorical (gender; diagnostic group; DBD pure, DBD and AD/HD, DBD and an internalizing disorder) and continuous (age, length of treatment)<sup>1</sup> predictors were performed for the four diversity and four dosage variables for the smaller sample of youth ( $N = 444$ ). Individual PEs were examined via  $\chi^2$  analyses, both with and without modified Bonferroni procedures.

## Results

### Number of Diagnoses

#### Diversity of PEs

Pearson and point-biserial correlations were conducted for the four diversity composite variables and client

characteristics (i.e., gender, age at treatment start, length of treatment episode, total CAFAS score at treatment entry). Gender, age, and length of treatment were significantly correlated with each of the measures of diversity and were thus included as covariates in the model. In contrast, entry CAFAS score was not significantly related to the diversity measures and was subsequently left out of the statistical procedures.<sup>1</sup> A series of analyses utilizing a GLM approach were conducted to examine all possible covariate-predictor interaction effects on each of the diversity scores. None of these interactions were statistically significant. As such, GLM analyses with the main predictor variable (number of diagnoses) and relevant control variables (i.e. client characteristics significantly related to the criterion variable) were computed. Analyses yielded significant main effects on all measures of diversity: diversity total  $F(2,563) = 7.87$ ,  $P < .01$ , diversity factor 1,  $F(2,563) = 4.42$ ,  $P < .01$ , diversity factor 2,  $F(2,563) = 9.86$ ,  $P < .01$  and diversity factor 3,  $F(2,563) = 6.31$ ,  $P < .01$ . Post hoc pairwise comparisons with Bonferroni correction (Bonferroni 1935) revealed that individuals with a DBD plus two additional diagnoses (multimorbid) received significantly higher scores on all four measures of diversity than youth with only two diagnoses (comorbid) and youth with a pure DBD. Individuals with a DBD and only one additional disorder did not significantly differ from the pure DBD group on these four variables. Means and standard deviations are presented in Table 3.



**Table 4** Means and standard deviations for all practice element diversity and dosage scores as a function of type of comorbidity ( $N = 444$ )

Source	DBD only $n = 165$		DBD and an attentional disorder $n = 164$		DBD and an internalizing disorder $n = 115$	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Diversity total	0.32	0.15	0.36	0.17	0.33	0.16
Diversity factor 1	0.42	0.24	0.49	0.24	0.43	0.24
Diversity factor 2	0.39	0.21	0.42	0.23	0.40	0.22
Diversity factor 3	0.48	0.20	0.53	0.22	0.51	0.22
Dosage total	11.04	5.69	12.14	7.09	11.14	6.65
Dosage factor 1	3.50	2.39	4.04	2.56	3.46	2.47
Dosage factor 2	4.14	2.42	4.28	2.95	4.23	2.92
Dosage factor 3	3.80	1.95	4.15	2.23	3.91	2.26

*Internalizing disorder* = Mood or anxiety disorder

Diversity total, factors 1, 2, and 3 score range: 0–1

Dosage total range: 0–51

Dosage factor 1 range: 0–15

Dosage factor 2 range: 0–19

Dosage factor 3 range: 0–13

No mean differences across diagnostic groups,  $P < .05$

With regard to individual PEs, 24 of the 51  $\chi^2$  analyses without the modified Bonferroni procedures were significant.<sup>2</sup> Of these 24, 5 were from factor 1 (or 33 % of all factor 1 PEs, 11 were from factor 2 (58 % of all factor 2 PEs), and 4 were from factor 3 (31 % of all factor 3 PEs) (2 PEs were from both factors 1 and 3 or factors 3 and 2). Only 6 PE-related  $\chi^2$ s were significant when using Holm to adjust for alpha levels. Specifically, the percentage of youth that received crisis management,  $X^2(1, N = 569) = 16.67$ ,  $P = .000$ , relaxation,  $X^2(1, N = 569) = 14.56$ ,  $P = .000$ , exposure,  $X^2(1, N = 569) = 12.26$ ,  $P = .000$ , medication and pharmacotherapy,  $X^2(1, N = 569) = 11.46$ ,  $P = .000$ , parent coping,  $X^2(1, N = 569) = 11.13$ ,  $P = .001$ , and assertiveness training,  $X^2(1, N = 569) = 10.80$ ,  $P = .001$ , differed based on number of diagnoses. Relevant PEs are indicated in Table 2.

#### *Dosage of PEs*

The foregoing analyses were repeated to evaluate differences between groups on the four dosage variables as a function of number of diagnoses. Age and length of treatment were included as covariates because they were significantly correlated with the composite dosage scores.

<sup>2</sup> Only 51 of the possible 63 PEs were examined via  $\chi^2$ , as 12 of the PEs had an insufficient sample size for adequate analyses.

A series of GLM analyses were conducted to examine all possible covariate-predictor interaction effects on each of the measures of dosage. Since none of these interactions were statistically significant, additional GLM analyses with number of diagnoses and the two significant control variables (age and length of treatment) were calculated. Results generated significant main effects for three of the measures of dosage: dosage total,  $F(2,564) = 6.87$ ,  $P < .01$ ; dosage factor 2,  $F(2,564) = 8.86$ ,  $P < .05$ ; dosage factor 3,  $F(2,565) = 6.22$ ,  $P < .01$ . Post hoc pairwise comparisons with Bonferroni correction (Bonferroni 1935) indicated that individuals with three or more diagnoses received significantly higher scores than youth with two diagnoses or youth with DBD alone for all dosage measures except dosage factor 1. Although there was no main effect for dosage factor 1, it should be noted that there was a non-significant trend ( $P < .06$ ) indicating a similar pattern of higher scores for multimorbid youth. Means and standard deviations are given in Table 3. Taken as a whole, the dosage of reported PEs differed as a function of number of diagnoses such that youth with a DBD and two or more diagnoses received higher dosage of practices throughout treatment than youth with pure DBD and youth with a DBD and one additional disorder, even after controlling for client age and length of treatment.

#### Type of Comorbidity

##### *Diversity of PEs*

Gender, age and treatment length were entered as covariates in the analyses comparing diagnostic groups. Results from the GLM analyses revealed that comorbidity status had no significant main effect on any of the four measures of diversity (regarding main effects, total diversity,  $F(2,438) = .51$ ,  $P = .60$ ; diversity factor 1,  $F(2,438) = .68$ ,  $P = .51$ ; diversity factor 2,  $F(2,438) = .468$ ,  $P = .63$ ; diversity factor 3,  $F(2,438) = .83$ ,  $P = .44$ ). Means and standard deviations for overall and factor scores are reported by diagnostic group in Table 4. These findings held true both when covariates were ignored and when controlling for all higher-level predictor and covariate interactions (i.e., all 2-, 3-, and 4-way). Similarly, no between group differences were found for any of the specific PE  $\chi^2$  analyses, regardless of whether Type I error was controlled or left to accumulate. Overall, findings indicated that the total diversity of PEs endorsed over the course of completed treatment episodes did not differ according to type of diagnostic comorbidity.

##### *Dosage of PEs*

Comparable GLM analyses were conducted to examine differences in dosage of PEs between groups as function of

comorbidity status. Age and length of treatment were significantly related to some measures of dosage and were included as covariates in the analyses. GLM results revealed no main effects for the four dosage variables for type of comorbidity (regarding main effects, dosage total,  $F(2,439) = .32, P = .73$ ; dosage factor 1,  $F(2,439) = .61, P = .88$ ; dosage factor 2,  $F(2,440) = .02, P = .99$ ; dosage factor 3,  $F(2,440) = .84, P = .43$ ) even when examined without relevant covariates or after controlling for higher level interactions between covariates and the criterion variable. Table 4 provides means and standard deviations for all factor scores.

## Discussion

The current study examined whether community therapists' treatment approaches differed as a function of type of comorbidity and number of diagnoses in a sample of youth with a DBD. Results indicated that therapists treated youth with a DBD and one additional disorder (i.e., attentional or internalizing) with roughly the same breadth and average number of practices per month with which they treated youth with a single DBD. Furthermore, even taking a very liberal approach to Type I error, there were no significant differences in the use any of the 51 specific practices as a function of carrying an attentional or internalizing disorder diagnosis. In contrast, youth with a DBD and two or more additional diagnoses were provided a significantly more diverse (larger variety) and greater dosage (higher mean number of PEs applied per month) of PEs than youth with one or two diagnoses. These findings held even after for controlling for potential confounding variables such as age, length of treatment episode, and gender. With regard to particular techniques, multimorbid youth were more likely to receive an eclectic array of practices overall (non-specific and from all three factors), with an emphasis on coping and self-control PEs (factor 2; particularly exposure, relaxation and assertiveness training) and non-specific PEs related to intensive behavioral problems (e.g., crisis management, parent coping, medication).

These findings provide important clues about what occurs in the "black box" (Bickman 2000) of youth treatment in community mental health settings. Therapists have long been skeptical of evidence-based approaches because of their reported lack of fit with the complex, co- and multimorbid clients served in usual care (Chambliss and Ollendick 2001). In this study alone, 71 % of all participants met criteria for multiple diagnoses. That said, comorbidity—narrowly defined as the presence of two disorders (e.g., Mueller et al. 2011)—did not have a significant effect on the amount, diversity, or specific techniques utilized by therapists.

These results contradict arguments by community providers who resist evidence-based services (e.g., Addis and Krasnow 2000; Borntrager et al. 2009; Nelson et al. 2006) and run counter to our original study hypothesis. Clinicians did not seem to systematically treat differently those with only a DBD and those with the additional complexity of one comorbid disorder. This was observed even when comparing youth with a DBD to youth with a DBD and an internalizing disorder: a situation in which practice differences might be particularly pronounced (e.g., Chorpita and Daleiden 2009; Evidence Based Services Committee 2009). Contrary to our hypotheses, youth with an internalizing disorder did not receive more coping or self-control practices than their peers with a single DBD or a DBD and an attentional disorder. Usual care practices seemed to span a variety of theoretical approaches and did not appear acutely sensitive to diagnostic profiles.

This does not imply that evidence-based services training should ignore comorbidity. Rather it suggests that, while community clients may well be complex, the standard usual care response is not particularly focused. A more nuanced approach would be to systematically incorporate practices derived from extant literature, which apply to each disorder. For example, there are some emerging models for treatment of comorbid conditions, primarily from research on adults with comorbid severe mental illness (e.g. schizophrenia) and substance abuse disorders. Standards for such dual diagnosis clients suggest (1) employing practices that treat each disorder simultaneously but distinctly or (2) targeting disorders in a simultaneous and integrated fashion (Drake et al. 1998; Horsfall et al. 2009). Clinicians could also utilize a thoughtful clinical decision-making model to help determine when and what to treat when working with comorbid youth (e.g., Chorpita et al. 2005). Modular treatment is one such promising approach for applying the evidence-based service literature with a highly-comorbid, clinical population. In this approach, therapists are trained in applying specific practices that are commonly identified in the research for each disorder. When treating a youth with comorbid problems, therapists can then employ techniques for specific problems in an organized and integrated manner (PracticeWise LLC 2012; Weisz et al. 2012).

Multimorbidity—the presence of more than two disorders—does appear to significantly increase the diversity and dosage of PEs. DBD youth with two or more additional disorders are provided more practices per month and more distinct practices over the course of their treatment. This is consistent with our original hypothesis, as greater eclecticism or diversity of practices is somewhat expected when treating complex cases with many diagnoses. At the same time, we still know far too little about multimorbid youth treatments to determine whether employing such a wide range and amount of PEs is truly beneficial to outcomes.

In some ways, the finding of increased dose and diversity after controlling for length of treatment is heartening. While clinicians seemingly do not respond to diagnostic profiles for youth with comorbid disorders, they do appear sensitive to the complexity of their multimorbid clients. An increased breadth of PEs might reflect a thoughtful and strategic attempt to continue to try new things when faced with significant treatment challenges. For example, the current study found that therapists were more likely to utilize certain cognitive and self-coping practices—as opposed to behavioral management or family interventions—with multimorbid youth than with pure or comorbid youth. This may be due to their deliberate decisions to apply PEs that boot strap youth clients to improve their emotional and behavioral functioning on their own (e.g., problem solving; Barkley et al. 2001). Perhaps more average PEs per month actually are key in effectively addressing youths' multifaceted diagnostic profiles, and community therapists must therefore be trained to apply a vast spectrum of therapeutic techniques (both evidence-based and non-evidence-based).

On the other hand, these findings might reflect therapist desperation. Multimorbid youth were more likely to receive crisis management, parent coping, and medication PEs when compared to their non-multimorbid peers. Kelley et al. (2010) have found that therapists address a great number of topics in sessions when dealing with a crisis. Thus it is conceivable that providers of multimorbid clients might cover a large array of practices following an emergency, in order to reestablish focus or gather information (Kelley et al. 2010). It is also possible that youth with multimorbidity are more prone to crises or less able to commit to the consistent and structured nature of the common techniques reflected in the evidence-base (i.e., parent management training).

Though our results did not indicate that clients' level of impairment (as measured by the CAFAS) was predictive of therapist behavior, other studies have found significant correlations between number of diagnoses, high levels of severity, and life course (e.g., Angst et al. 2002; Kessler et al. 2012). Perhaps multimorbid youth in this study were impaired or disadvantaged in ways that were not captured by the current data set. Community clients tend to live in impoverished neighborhoods (Burns et al. 1995) and are often exposed to ongoing psychosocial stressors (e.g., domestic violence, parental mental illness; Harman et al. 2000; Farmer et al. 1999, respectively). These social and environmental factors might not have been reflected in this study's measure of functional impairment, but might have influenced therapists' practices. Future research should seek to examine whether other measures of case complexity such as environment are related to the application of specific techniques.

Most clinicians are familiar with the changing diagnoses and adding of new medication trials when an ongoing intervention is not adequately successful. While this might be justified when administering psychotropic medications, the same justification regarding psychosocial interventions is less clear. Therapists might be alternating between techniques too quickly, without providing an adequate dose or efficiently evaluating progress related to those particular techniques. Perhaps clinicians attempt every method in their skill set with complex youth, in the absence of clear direction from single diagnosis, evidence-based manuals.

### Limitations

These findings should be interpreted within the context of several limitations. First, the main variables of interest were type and number of diagnoses, which necessarily rely on accurate diagnosis. While the standards for the system of care used in the present study expect reliable and valid semi-structured interviews, diagnoses in treatment as usual are not likely to meet the psychometric properties of similar assessments found in tightly controlled research settings. (Daleiden et al. 2004; Rettew et al. 2009). There are two paths that suggest themselves for future research in this regard. First, the examination of carefully designed randomized control trials of interventions specifically designed for co- and multimorbid youth will advance knowledge about efficacy of treatment for such disorder profiles. Second, future research on comorbidity and usual care may wish to consider more dimensional measures of diagnoses, such as symptom counts, actual treatment targets (e.g., Love et al. 2011) or scores on tests of emotional and behavioral functioning (e.g., Child Behavior Checklist; Achenbach 1992).

The use of therapists' self-report of treatment techniques is a simple and cost-effective method of assessing treatment as usual. At the same time, the MTPS requires providers to retrospectively give an account of the past 30 days of clinical service, potentially decreasing the validity of the measure. Furthermore, several studies indicate discrepancies between direct observations of therapist behaviors and their self-reports (e.g., Hurlburt et al. 2009). Future research on the statistical viability of such instruments is needed to both understand and control for the aforementioned discrepancies. Nonetheless, clinician-report measures including the MTPS have many desirable psychometric qualities and have demonstrated both feasibility and adaptability (Nakamura et al. 2011; Schoenwald et al. 2011). As an example, the MTPS has become a routinized component of a large system of care for almost a decade and has been adapted for use by providers in Australia (Bearsley-Smith et al. 2008).

While the present study was able to evaluate the quantity of practices reported over time it was not able to focus on the exact intensity or quality with which the PEs were applied during sessions. Furthermore due to the nature of the data set, we were unable to examine the number of clinical sessions per month. These limitations are particularly pertinent, as upcoming research on community mental health seeks to go beyond the description of practices to evaluating the specific factors in treatment success. While the study of actual therapist behaviors is vital, the use of self-report in this study also provides some advantages. Many community therapists claim that they are sensitive to the nuances of comorbidity and adjust their practices accordingly—whether those approaches are supported by the research literature or not. Although this claim is challenged by the fact that clinicians do not report changing their practices as a function of comorbidity, it is also supported by our finding that multimorbidity influences therapist-reported treatment strategies.

## Conclusions

Findings of the current study, focused on mostly moderately to highly impaired adolescents, add to the work done by others on treatment as usual for DBDs (Garland et al. 2008). They also inform efforts to disseminate and implement evidence-based practices and add to the larger debate about what supports community practitioners need from the scientific field. Clearly, results highlight the lack of studies distinguishing comorbidity from multimorbidity, pointing to the need for more nuanced investigations about the mental health treatment of such youth clients (e.g., sequence of practices, treatment targets, outcomes).

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