



Disruptive Behavior Treatment Progress as a Function of Therapy Focus and Youth Diagnosis in a Community Mental Health Setting

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Abstract

Monthly disruptive behavior treatment progress for 613 youth ages 7–18 receiving intensive in-home services was examined. Multilevel modeling indicated carrying a depressive mood diagnosis predicted less disruptive behavior progress compared to youth with only externalizing diagnoses. Paradoxically, more monthly focus on disruptive behavior treatment targets predicted lower concurrent progress ratings, while greater focus on depressive mood targets predicted greater disruptive behavior progress for youth with a depressive mood diagnosis. Findings held when other predictors of disruptive behavior progress were included as covariates, including episode length, youth age, and functional impairment. Treatment and research implications are discussed.

Keywords Children's mental health · Disruptive behavior · Depression · Usual care · Treatment targets

Introduction

Usual care (UC) therapy is characterized by complexities and treatment modalities that differ from more highly controlled therapy reflected in process and outcome research. Further understanding of UC is needed because it can strengthen the bridge between research and practice (Baker-Ericzén et al. 2010; Garland et al. 2010a), and can illuminate patterns unlikely to be discovered in more controlled research (e.g., Garland et al. 2010b; Love et al. 2016). UC is often the comparison group in treatment effectiveness research, where effect sizes tend to be smaller than those found in efficacy studies, suggesting some active ingredients in UC (Kazdin 2015). More generally, there have been recent calls for a closer examination of UC to better understand what is done in such treatment and what predicts treatment outcomes (Bickman 2000; Kazdin 2015).

Disruptive behavior problems (DBP) are the most common reason for referral to child and adolescent UC practice, but youth with DBP often present with comorbid diagnoses, other sub-clinical symptoms, and/or other life challenges that add complexity to cases and can serve as additional targets of treatment (Garland et al. 2001; Mueller et al. 2010). Although many disruptive youth present with predominantly externalizing diagnoses (e.g., attention-deficit/hyperactivity disorder, oppositional defiant disorder (ODD), conduct disorder), DBP also frequently manifest with comorbid depressive mood disorders (Angold et al. 1999; Wilkie et al. 2016). Compared to purely externalizing youth, those with comorbid depressed mood show different associations in onset, course, and outcome, pointing to differences in underlying etiology (e.g., Moffitt et al. 2002; Boylan et al. 2012). These etiological differences suggest potential differences in response to treatment, and some efficacy research suggests that increased depressed mood symptoms predict more positive response in some evidence-based disruptive behavior treatment programs (e.g., Beauchaine et al. 2005; Jarrett et al. 2014).

Youth mental health problems can be viewed from two overlapping perspectives. First, such problems are symptoms or associated features of an underlying mental health challenge. From this perspective, problems describe youth characteristics and psychological status. A second perspective is grounded in how therapists and clients define what

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problems to target in treatment (Love et al. 2014). Most treatment research investigates changes in problem status (e.g., change in amount or extent of a problem or percent of youth still impaired). Examining specific ongoing targets of treatment and improvement on such targets can provide an alternative and nuanced lens to understand the complexities of UC treatment (Love et al. 2014, 2016; Milette-Winfrey and Mueller 2017). Across treatment settings and therapeutic orientations, negotiating treatment targets with clients is a universal aspect of mental health care (Nezu and Nezu 1993). The extent to which particular problems receive attention might play an important but overlooked role in the process and outcome of treatment, particularly for less structured and more variable treatment approaches often seen in UC systems (e.g., Garland et al. 2010b).

Disruptive Behavior Problems

Behavior problems that include oppositional behavior, noncompliance, aggression, and delinquency are the most commonly diagnosed psychiatric disorders in UC systems (Garland et al. 2001), and disruptive behavior patterns are responsible for the highest rate of referral for youth mental health services (Hinshaw and Lee 2003; Mueller et al. 2010). DBP are associated with negative societal impact, including harm to others, school truancy, legal issues, and public expenditures (e.g., Foster et al. 2005; Scott et al. 2001); and long-term sequelae, including poor interpersonal relationships, workplace problems, lower academic achievement, increased criminal behavior, and greater mortality rates (Burke et al. 2014; Kazdin 1997).

Youth with DBP are a diverse group with high rates of additional diagnoses, particularly in clinical samples (Hinshaw and Lee 2003). DBP are often associated with combined and primarily hyperactive/impulsive attention-deficit/hyperactivity disorder (ADHD). Approximately one-half of youth meeting criteria for ADHD carry a comorbid disruptive behavior disorder (i.e., ODD or conduct disorder), and approximately half of youth with a disruptive behavior disorder have comorbid ADHD (Newcorn and Halperin 2000). Youth with ADHD and disruptive behavior are often characterized as following an “externalizing” developmental pattern, cascading from ADHD into conduct disorder and potentially substance use problems and antisocial tendencies in adolescence and adulthood (e.g., Beauchaine et al. 2010; Loeber and Hay 1997; Stalk et al. 2015).

Disruptive Behavior and Depressed Mood

DBP might also manifest in youth with depressive mood, and such co-occurrence seems to represent a disruptive behavior developmental track distinct from an “externalizing” developmental cascade. Irritability might play a key

role in the relationship between depressive symptoms and certain forms of DBP in youth. Both *DSM-IV-TR* and *DSM-5* include a criterion for irritable mood in the diagnosis of multiple depressive disorders for children and adolescents (American Psychiatric Association 2013; American Psychiatric Association 2000), and *DSM-5* now describes a distinct disruptive mood dysregulation disorder. Irritability is characterized by a low threshold for annoyance and the expression of anger, and is listed as a symptom across multiple diagnoses, including ODD (Stringaris 2011). ODD is a significant predictor of a later diagnosis of depression in youth, with evidence suggesting that ODD might be the strongest diagnostic predictor of young adult depression, even above a diagnosis of childhood depression (Burke et al. 2005; Copeland et al. 2009). In particular, the ODD factor dimension labeled variously as “negative affect” or “irritability” is predictive of a later diagnosis of depression (Burke et al. 2010; Loeber et al. 2009). These findings, taken together, suggest a developmental track of disruptive behavior issues that leads into adolescent and adult depressive mood problems, possibly due to different underlying mechanisms such as irritability.

Youth with comorbid depressive mood difficulties might respond differently to disruptive behavior treatment. In a reanalysis of six randomized controlled trials of disruptive behavior treatment for early-onset conduct problems, Beauchaine et al. (2005) found that youth above the sample mean on anxiety/depression symptoms showed greater symptom improvement on the “externalizing” broadband factor of the Child Behavior Checklist (a measure of DBP) over the course of therapy, but began treatment with more disruptive behavior symptoms and continued to display more behavior problems at termination. A recent study by Jarrett et al. (2014) that examined an aggression treatment program focused on cognitive processes found that elevated youth depression symptoms, distinct from youth anxiety symptoms, predicted greater symptom improvement on a composite measure of aggressive behavior, conduct problems, and hyperactivity. It is unclear whether this improved treatment response relates to a focus on targeting cognitive processes rather than behavioral targets, or whether focusing on depressive mood targets can increase treatment effectiveness for comorbid youth.

Treatment Targeting

With its inherent variability across cases, UC provides a valuable avenue to examine if and how differences in treatment focus might predict treatment outcomes. Examining treatment targets that align with DSM criteria for disruptive behavior and mood disorders would provide insight on how treatment foci and diagnoses alone or in interaction might predict outcome. Focusing on targets of treatment

and their corresponding outcomes allows for a more flexible and nuanced account of the range of client factors and treatment approaches seen in UC. Targets focused upon in treatment change more rapidly than diagnoses, which presents an opportunity to examine more immediate progress in response to coinciding patterns of treatment targeting. Fortunately, treatment targets in UC reliably relate to corresponding diagnoses (Daleiden et al. 2004), organize into meaningful categories (Love et al. 2016), and can be coded into diagnostic categories (Love et al. 2014). Specifically, in the Love et al. (2014) study, independent raters reliably coded targets as uniquely representing one of four common child mental health disorders, including DBP (*DSM-IV-TR* ODD and/or CD) and *DSM-IV-TR* mood disorders (see “treatment target diagnostic category alignment” in Method section below).

Current Study

Using archival data from the first 6 months of intensive in-home UC mental health treatment, we examined whether youth with both DBP and at least one depressive mood disorder showed differential progress on disruptive behavior treatment targets compared to youth with only externalizing disorder diagnoses. We also examined whether a relative focus on disruptive behavior or depressive mood-related treatment targets predicted progress in these two groups. Three primary study questions were addressed: In a sample of youth for whom DBP are part of the focus of their treatment, (1) Is the presence of a mood disorder diagnosis associated with more or less disruptive behavior progress compared to youth with externalizing-only diagnoses? (2) Does relative monthly focus on disruptive behavior targets and/or depressed mood targets predict concurrent disruptive behavior treatment progress? (3) Does the degree of focus on disruptive behavior and/or mood target groups interact with diagnostic category to predict disruptive behavior progress?

Method

System of Care

In the public mental health system of care under study, the least intensive services are provided by the Department of Education through their school-based behavioral health program and are not part of this study. The intensive-in-home (IIH) services examined here represent the most common and least restrictive service level within the service array provided by the Department of Health Child and Adolescent Mental Health Division, or CAMHD. Roughly speaking, IIH services are delivered more frequently than typical clinic-based services, generally but not always involve families,

crisis management and care coordination, and are provided in the youth’s home or community, rather than in mental health clinics. IIH treatment is focused on improving youth and families’ functioning in their present environment and avoiding the need for placement in more restrictive care settings (e.g., residential care). IIH treatment intensity can vary considerably, with therapists initially authorized for up to 24 hours of services per month, and youth often receiving services more than once per week. Qualification for IIH services depends on youth exhibiting emotional and/or behavioral problems in the home and/or community, carrying a DSM diagnosis, and displaying significant impairment across multiple domains of functioning (CAMHD 2012). IIH clients are not selected on the basis of specific diagnoses or specific psychological problems, nor are specific practices or target(s) of therapy prescribed. As such, this level of care is amenable to the present study questions while also representing the service closest to outpatient community treatment and the vast majority of clinical efficacy and effectiveness treatment research studies.

Youth Participants

Six hundred thirteen participants between ages 7–18 ($M = 14.1$, $SD = 2.8$) who received services between July 1, 2006 and September 30, 2012 and completed at least 90 days of IIH treatment served as the study sample. Youth sample characteristics can be seen in Table 1. Mean treatment episode length was 263.2 days ($SD = 189.5$). This study examined only the first 180 days of treatment to allow sufficient time for treatment response to emerge (Jackson et al. 2017), while also reducing the impact that extended episode lengths might have as a confounding variable.

All youth cases had at least one of three disruptive behavior treatment targets (i.e., “aggression,” “anger,” “oppositional or non-compliant behavior”) endorsed for at least two reporting months within the first 6 months of treatment. For this reason, the entire sample is conceptualized as exhibiting DBP. *DSM-IV-TR* diagnoses were determined via mental health evaluations conducted by CAMHD staff or contracted providers (CAMHD 2012), and the diagnoses nearest to IIH episode start date were used in analyses. Youth with any diagnosis related to psychosis, mania (including bipolar disorder and mood disorder, NOS), posttraumatic stress, anxiety, mental retardation, borderline intellectual functioning, ADHD predominantly inattentive, or pervasive developmental disorder were excluded from the study. All youth in the sample met criteria for one of two diagnostic groups:

- (1) Externalizing-only behavior group ($n = 449$): Youth with a disruptive behavior disorder diagnosis (i.e., conduct disorder; ODD; adjustment disorder with disturbance of conduct; or disruptive behavior disorder,

Table 1 Youth demographic and clinical information by diagnostic group and total sample (N = 613)

Variable	Externalizing-only group	Depressive mood group	Total sample
Sample size ^a	449 (73.2%)	164 (26.8%)	613 (100%)
Age	13.8 (3.0)	14.8 (2.1)	14.1 (2.8)
Gender (male) ^a	350 (78.0%)	104 (63.4%)	454 (74.1%)
Comorbid diagnosis ^a	247 (55.0%)	83 (50.6%)	330 (53.8%)
Length of IHH episode (180 or more days) ^a	263 (58.6%)	99 (60.3%)	362 (59.1%)
Race ^a	–	–	–
Asian	35 (7.8%)	15 (9.1%)	50 (8.2%)
Black	9 (2.0%)	1 (0.6%)	10 (1.6%)
Multiracial	306 (68.2%)	103 (62.8%)	409 (66.7%)
Native Hawaiian or Other Pacific Islander	42 (9.4%)	23 (14.0%)	65 (10.6%)
White	42 (9.4%)	15 (9.1%)	57 (9.3%)
Other	5 (0.9%)	1 (0.6%)	5 (0.8%)
Not available	11 (2.4%)	6 (3.7%)	17 (2.8%)
Impairment at entry (CAFAS)	92.0 (29.0)	88.8 (32.3)	91.1 (29.9)
Diagnosis at entry (any) ^a	–	–	–
ADHD-C/ADHD-PH	193 (43.0%)	0	193 (31.5%)
Conduct disorder	150 (33.4%)	32 (19.8%)	182 (29.7%)
ODD	176 (39.2%)	27 (16.5%)	203 (33.1%)
Other DBD (NOS, adjustment)	82 (18.3%)	16 (9.8%)	98 (16.0%)
MDD	0	55 (33.5%)	55 (9.0%)
Dysthymia	0	66 (40.2%)	66 (10.8%)
Other mood (NOS, adjustment)	0	50 (30.5%)	50 (8.2%)
Substance use	107 (23.8%)	40 (24.4%)	147 (24.0%)
Other	42 (9.4%)	12 (7.3%)	54 (8.8%)
Predictor disruptive behavior targets/month	1.83 (0.89)	1.67 (0.87)	1.79 (0.89)
Disruptive behavior progress rating targets/month	1.61 (0.58)	1.56 (0.61)	1.59 (0.59)
Depressed mood targets/month	0.99 (0.83)	1.37 (0.83)	1.09 (0.88)
Clinician degree (Ph.D./Psy.D.) ^a	22 (4.9%)	10 (6.1%)	32 (5.2%)
Clinician licensure (yes) ^a	74 (16.5%)	26 (15.9%)	100 (16.3%)

^aRepresents frequencies and percentages. All other variables represent means and standard deviations

NOS), and/or with a diagnosis of attention-deficit/hyperactivity disorder, primarily hyperactive/impulsive or combined type (i.e., ADHD-PH or ADHD-C), and no depressive mood diagnosis. Youth with ADHD-PH and ADHD-C were included in this group due to the association between ADHD and the “externalizing” developmental cascade of DBP.

- (2) Depressive mood group ($n = 164$): Youth with a depressive mood diagnosis (i.e., major depressive disorder; dysthymia; adjustment disorder with depressed mood; or depressive mood disorder, NOS) and no ADHD diagnosis. A disruptive behavior diagnosis is allowed but not required. However all youth in this group did receive multiple months of disruptive behavior treatment focus (as did the externalizing only group). Youth with ADHD and a mood disorder were excluded from this study group to better distinguish it from the “exter-

nalizing” developmental cascade of disruptive behavior.

As can be seen in Table 1, the sample was predominantly male (74.1%), multiracial (66.7%) and comorbid (53.8%). Youth in the externalizing-only group were more likely to be male than youth in the depressive mood group, $\chi^2(1, n = 613) = 13.21, p < .001$. There were no other significant demographic differences across groups. By study inclusion and exclusion rules, there were pre-determined group differences in diagnoses (e.g. no mood diagnosis in the externalizing-only group). In addition, the externalizing-only group was significantly more likely to carry a diagnosis of conduct or ODD (both $p < .05$). Slightly less than one-half of youth in the depressed mood group (45.1%) carried a comorbid disruptive behavior disorder diagnosis. The groups did not significantly differ on rates of substance use disorder or

number of comorbid diagnoses. Diagnostic groups did not significantly differ on average number of disruptive behavior targets endorsed per month, but youth in the depressed mood group received significantly more depressed mood targets per month than did youth with externalizing-only diagnoses; $t(611) = 4.91, p < .001$ (see [Measures](#) section for description of how targets were operationalized).

Therapist Participants

Clinical data were provided by 172 therapists. When multiple therapists worked on the same case the one who most frequently completed the monthly therapy data was considered the lead therapist for analyses. When two or more therapists completed the same number of forms, the first therapist was chosen for all analyses, in part because previous research in this system of care indicated that youth typically see more rapid improvement earlier in treatment (Jackson et al. 2017). Relevant therapist data were examined including therapist's degree (i.e., mental health doctorate vs. master's or lower clinical degree) and licensure status. The majority of therapists were unlicensed (83.1%) and were trained to the Master's degree level (91.9%). Two therapists were Master's level therapists for some clients and obtained a doctorate degree before treating other clients. One therapist was unlicensed for some clients and obtained licensure before the treatment of other clients. Therapist licensure and degree did not significantly vary by diagnostic group.

Measures

Monthly Treatment and Progress Summary (MTPS; CAMHD 2005)

The MTPS is a clinician report form designed to measure service format and setting, therapist practices utilized in treatment, problem areas targeted by the therapist ("treatment targets"), and client progress on each selected treatment target. Clinicians indicated up to ten targets (from a list of 53 predefined targets and two blank "write-in" targets) that were the focus of treatment for that month and provided a subjective rating of progress for each individual target. Progress ratings were scored for each treatment target endorsed that month on a 7-point scale, ranging from 0 = ≤ 0% improvement (Deterioration) to 6 = 91–100% improvement (Complete Improvement). When possible, progress ratings were to be informed by objective measures available to the therapist, such as assessments administered and behavioral observation data. Progress ratings were scored from an initial baseline, so that each monthly progress rating is scored relative to initial problem level for each target behavior (CAMHD 2008).

Each MTPS was completed on a monthly basis, and completion of the MTPS for each client became mandatory for reimbursement in July 1, 2006 (Nakamura et al. 2007). Previous validity data indicated MTPS treatment targets were associated with relevant primary diagnostic categories (Love et al. 2014), hold a reasonable factor structure (Love et al. 2016), and exhibit moderate temporal stability after one ($k = .66$) and three ($k = .52$) months of treatment (Daleiden et al. 2004). Change in MTPS progress ratings showed significant relationships to change in youth functional status as measured by two standardized measures of clinical functioning, and demonstrated temporal patterns of improvement that mirror other treatment outcome measures (Jackson et al. 2017; Nakamura et al. 2007).

Child and Adolescent Functional Assessment Scale (CAFAS; Hodges 2000)

The CAFAS is a 200-item functional impairment measure completed quarterly by care coordinators in the system under study. The child is scored based on his or her highest level of impairment over the past 3 months (i.e., no/minimal = 0, mild = 10, moderate = 20, severe = 30) within each of eight domains. Domain scores were summed to calculate the youth's total CAFAS score (range 0–240). The CAFAS has demonstrated adequate internal consistency, convergent and concurrent validity, and good inter-rater reliability (Hodges and Gust 1995; Hodges and Wong 1996; Mueller et al. 2010; Nakamura et al. 2007). Total CAFAS score that was completed closest to each youth's episode start date was included in the current analyses.

Procedure

After receiving University of Hawaii Institutional Review Board approval, a minimally-necessary data-limited data set was electronically extracted from the Child and Adolescent Mental Health Management Information System at CAMHD. Clinical documentation of all registered clients within the CAMHD system is recorded and stored in accordance with performance standards (CAMHD 2012).

Disruptive Behavior Target Progress Ratings

DBP progress ratings were calculated for each month by averaging any included progress ratings of the "anger," "aggression," and "oppositional or non-compliant behavior" targets on the MTPS. These three disruptive behavior targets were selected as an aggregate measure of DBP given they are relatively frequently endorsed (Love et al. 2016; Milette-Winfrey and Mueller 2017), loaded together in a factor analysis (Love et al. 2016), were among seven targets reliably coded to reflect DSM disruptive behavior symptoms

(Love et al. 2014), and demonstrated similar patterns in rate and level of progress over IHH treatment (Love et al. 2014).

Treatment Target Diagnostic Category Alignment

Previous research has found that seven of the 53 pre-defined MTPS targets were reliably coded to be uniquely associated with disruptive behavior diagnoses (ODD and CD) but with none of the other three common childhood disorders (ADHD, anxiety, or mood). These targets are anger, aggression, oppositional or non-compliant behavior, peer/sibling conflict, runaway, school refusal/truancy, and willful misconduct. Six targets were found to be reliability coded to be uniquely associated with mood disorders: activity involvement, contentment/happiness, depressed mood, low self-esteem, positive thinking/attitude, and suicidality (Love et al. 2014). Thus, these target categories were aggregated and used as treatment target predictors representative of disruptive behavior targeting and depressive mood targeting during treatment, respectively.¹

Data Preparation

During the process of cleaning the MTPS data, 220 out of 4724 (4.65%) MTPS entries were identified as having at least one additional MTPS filled out for the same youth during that same month. None of these duplicate or triplicate MTPS entries contained identical MTPS data, and many were completed by different therapists, suggesting that these multiple MTPS month entries reflected real clinical data. As such, such MTPS entries were aggregated to preserve clinical data, with all endorsements of treatment targets maintained and all progress ratings averaged. MTPS completion rates were very high, with 37 MTPSs (1.1% of the total sample of 3408) considered missing (some of which likely reflect the absence of a billable service during a given month of treatment). Only two cases had no CAFAS data completed at any point during their CAMHD treatment services. To address this missing data, a multiple imputation was used to calculate a CAFAS value using relevant variables that occurred in the same level (i.e., level-two variables; youth gender, youth age, diagnostic group, length of treatment) as the CAFAS Total Score. Five imputations were performed per missing CAFAS, and the median imputation value for each youth was selected.

¹ The disruptive behavior target predictor variable included all seven targets while the outcome progress rating criterion variable was based on only three of these targets (see justification earlier). To assure this choice did not affect results, all analyses were replicated using only the subset of three disruptive behavior targets as predictors with no change in results. Data available from author.

Data Analytic Strategy

Due to the nested nature of the data, MLM techniques were employed. The aggregate of disruptive behavior progress ratings on the targets anger, aggression, and oppositional or non-compliant behavior served as the outcome variable. SPSS version 23 was utilized to analyze the three-level mixed-effects model, where time, as measured by MTPS month, was nested within youth or case, which was nested within therapists. Quadratic time was included in the model due to the trend of growth curve shape (Singer and Willett 2003). Level-one included linear and quadratic time in months, number of disruptive behavior targets endorsed each month, and number of depressive mood targets endorsed each month. Level-two included youth diagnostic category, the interaction between diagnostic category and both mood targeting and disruptive behavior targeting, and other time invariant youth or case characteristics (i.e., gender, age, presence of substance use disorder, level of impairment at episode start, length of episode). Level-three predictors included therapist characteristics (i.e., therapist highest degree, therapist licensure) as covariates. Client age and total CAFAS scores were mean-centered to maximize data interpretation and the impact these variables had on the end of treatment progress rating (Heck et al. 2013).

Given the nature of the progress rating scale (improvement from baseline) and that data are available only after the first full or partial month of treatment, the intercept was defined as ending status (i.e., the predicted level of the criterion variable at the end of the 6-month study window, adjusted for the other variables in the model). By recoding the time variable in this manner, the intercept could be interpreted as each youth's final average improvement rating on MTPS DBP treatment targets after at most 6 months of treatment. To define the intercept as ending status, the time variable was coded such that the last month of treatment for each youth was 0, with previous months coded consecutively as negative numbers in increments of -0.2 (up to -1 for 6 month episodes). As such, the value assigned to the first month of treatment for each youth varied, with youth receiving 6 months of treatment coded between -1 (at first month) and 0 (at end of treatment), and youth receiving 3 months of treatment coded between -0.4 (at first month) and 0 (at end of treatment). Additionally, given the intention to define intercept as ending status after at most 6 months of treatment, as well as the quadratic growth curve of progress ratings that shows more rapid increases early in treatment that then diminish over time, quadratic time was coded negatively, such that linear time was squared and then multiplied by negative one, maintaining the structure of time as coded between -1 and 0.

Results

Before conducting an MLM, a preliminary step is often to partition the variance in the outcome into the proportion present at each level (i.e., calculating the ICC). For longitudinal models like the one in this study, it is typically recommended to use an unconditional growth model that includes a variable for time in the null model (Heck et al. 2013). It was estimated that time-varying level (i.e., level one) accounted for 67.80% of the variance, client-level (i.e., level two) variables accounted for 7.34% of the variance, and therapist-level (i.e., level three) variables accounted for 24.86% of the variance in the analysis. Predictors in the model were entered as fixed effects, and quadratic time was found to be a significant fixed effect, $F(1, 2022.39) = 27.463$, $p < .001$, resulting in the retention of both linear and quadratic time in the model (Heck et al. 2013). When investigating the covariance parameters of this model, there was significant variability in the intercept within youth (Wald $Z = 19.31$, $p < .001$), between youth (Wald $Z = 2.25$, $p < .05$), and between therapists (Wald $Z = 5.70$, $p < .001$).

Variables at each level were added to the model sequentially from level one to level three, and significant covariates were maintained in the model while non-significant covariates were removed. All predictors in the level one model were significant and maintained in the final model. Non-significant level two predictors ($p > .05$) of disruptive behavior progress that were tested and removed prior to the final model included youth gender, youth ethnicity, and the presence of a substance use disorder. Additionally, the interaction between youth diagnostic category and disruptive behavior targeting was non-significant ($t = 0.13$, $p = .896$) and therefore not maintained in the final model. Both level three predictors, therapist licensure status and therapist highest degree obtained, were not significant and removed from the final model.

As can be seen in Table 2, predictors of greater disruptive behavior progress included quadratic time ($t = 5.33$, $p < .001$), and fewer disruptive behavior targets per month ($t = -3.75$, $p < .001$). Several youth characteristics predicted higher disruptive behavior progress, including the absence of a mood diagnosis ($t = -3.19$, $p = .001$), older age ($t = 3.15$, $p = .002$), treatment duration greater than 180 days ($t = 3.50$, $p = .001$), and lower impairment as measured by the CAFAS ($t = -3.33$, $p = .001$). The interaction between youth diagnostic category and depressive mood targeting was significant ($t = 2.01$, $p = .045$). Follow-up analyses indicated depressive mood targeting significantly predicted higher progress ratings for the depressive mood group ($\beta = .174$, $t = 3.47$, $p = .001$), but not for the externalizing-only group ($\beta = .052$, $t = 1.66$, $p = .097$).

Table 2 Parameter estimates based on monthly disruptive behavior progress rating (N = 613)

	Final model
Fixed effects	
Final average progress rating	
Intercept	3.075*** (SE = 0.106)
Time (quadratic)	1.103*** (SE = 0.207)
Time (linear)	-0.048 (SE = 0.208)
Depressive mood group	-0.325** (SE = 0.102)
Depression targets by month	0.052 [~] (SE = 0.031)
Disruptive behavior targets by month	-0.096*** (SE = 0.026)
Depressive mood group*depression targets by month	0.107* (SE = 0.053)
Treatment duration (> 180 days)	0.247** (SE = 0.071)
Age in years (grand mean centered)	0.039** (SE = 0.012)
CAFAS (grand mean centered)	-0.004** (SE = 0.001)
Variance components	
Level-1	1.198***
Level-2	0.075
Level-3	0.452***
Error variance	0.411***

[~] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$

Discussion

The primary aim of this study was to determine whether and to what extent the presence of a mood disorder and differential treatment targeting patterns predicted monthly and total DBP improvement within the first 6 months of IHH treatment. Contrary to prior research, youth with a depressive mood diagnosis showed less disruptive behavior progress than youth in the externalizing-only diagnostic group. The diagnostic group by depressive mood targeting interaction was significant, and follow-up simple main effects indicated that greater monthly depressive mood treatment targeting significantly predicted higher monthly disruptive behavior progress for youth with a mood diagnosis, but not for youth with externalizing-only diagnoses. Furthermore, older age, longer length of treatment, and lower total CAFAS impairment scores significantly predicted higher average DBP progress ratings.

Contrary to prior research (Beauchaine et al. 2005; Jarrett et al. 2014), youth with depressed mood showed significantly less disruptive behavior progress than youth with only externalizing diagnoses. The current study differed from the prior research in many ways, including the use of DSM diagnoses to define depressed mood (rather than elevated scores on continuous measures), a predominantly teenager and significantly impaired sample (rather than at-risk youth within a narrow and younger age band), treatment by predominantly masters-level therapists delivered at the IHH level (rather

than less intense outpatient therapy delivered under close supervision characteristic of efficacy studies), and being set in UC (rather than a structured, manualized treatment approach). That said, the findings more closely mirror the results from Beauchaine et al. (2005) which indicated final DBP level remained higher for youth with elevated internalizing symptoms.

At least in this setting, comorbid mood disorders look as though they can interfere with disruptive behavior treatment progress above and beyond that accounted for by differences in impairment, age, or even length of treatment (controlled for in the analyses). It might be that the youth with both DBP and mood disorders who reach this level of mental health services reflect a difficult-to-treat combination. Alternatively, or additionally, the less structured UC setting might lead therapists to diffuse efforts across multiple problem areas. Finally, and in light of prior research that indicates an advantage in treatment outcomes for doctoral level therapists regarding internalizing but not externalizing problems (Weisz et al. 1995), it seems possible that the presence of a mood disorder can become a particular challenge for mostly unlicensed masters-level therapists. Whether and to what extent youth impairment, therapist expertise, and/or treatment setting explain the differences in findings across studies requires further research, possibly focused on less intensive levels of care, or in disseminated evidence-based programs such as Multisystemic Therapy.

Regarding treatment targeting patterns, greater therapist endorsement of disruptive behavior targets on the MTPS predicted lower disruptive behavior progress ratings, a finding which on its face appears counter-intuitive. Importantly, treatment targeting measures were time-varying within the model, so effects of each month of targeting were measured and compared to progress ratings in that concurrent month. Disruptive behavior targeting in treatment might have increased during months in which disruptive behavior is particularly severe, with clinicians “putting out fires” during particularly challenging months. If true, it would follow that these months would also reflect correspondingly lower progress ratings. Months when a youth is displaying less severe DBP might allow therapists more opportunity to turn their attention away from those problems and toward other targets. While these and all other findings in this study are correlational, this month-to-month relationship between therapist focus and extent of problem manifestation provides a clue into community care and the demands placed on therapists in such setting. This finding might partly explain why community therapists are not fond of manualized treatment programs (Borntreger et al. 2009), which likely seem quite distant from what they currently do (or feel they need to do). Such findings have implications for dissemination and implementation efforts (e.g., “know your audience”) and provide ideas derived from practice than can advance future

research (e.g., what, if any, are the positive and negative effects of altering targets reactively throughout treatment?).

Notably, youth with depressive mood diagnoses (but not those with externalizing disorders only) showed significantly greater disruptive behavior progress during months when more mood targets were endorsed. Again, the correlational nature of the findings make definitive interpretation difficult and it is possible that, at least for depressed youth, months with less “acting out” allow the therapist to focus on the emotional and self-care problems associated with mood disorders. Clients who were able to work with therapists on alleviating the unpleasant symptoms of depressed mood, rather than decreasing the willful and irritable symptoms of disruptive behavior, might have exhibited less barriers towards treatment or had stronger therapeutic alliances with their therapists. Youth clients might also receive more benefit from a focus on mood goals, rather than a sole focus on managing and modifying disruptive behaviors, addressing the “underlying issues” (e.g., irritability) that might have served as a motivator for disruptive behavior. Indeed, the fact that months with more focus on depressed mood targets trended towards an association with higher disruptive behavior progress ratings for the externalizing-only group suggests the possibility of a more generalizable effect. The findings point to ways mood and disruptive problems might be related at least for youth with comorbidity. Behavioral problems might have a more irritable, reactive quality for youth with co-occurring mood problems. Treatment focused more on management of negative emotions, coping skills, and pleasant activities might be particularly useful for such youth. For youth with externalizing-only disorders, a greater focus on impulse control (when ADHD is present), contingency management and problem solving might be more promising. Future studies that measure and/or manipulate different components of treatment for different groups of youth with DBP would go a long way to answering such questions.

Youth in community mental health might differ in important ways from youth who participate in randomized control trial research, and direct work with youth on mood and positive behavioral goals might be more effective than engaging and working with parents in community mental health. Additionally, youth in community mental health might be less responsive to consequence-oriented treatment often seen in disruptive behavior treatment due to genetic vulnerabilities (e.g., increased rates of callous and unemotional traits) and family environment reasons (e.g., less parental structure and supervision), and a treatment approach focused on increasing positive mood might be effective in cases with such potential barriers. Community mental health treatment might see more success in focusing on positive mood goals directly with youth clients, bypassing barriers less commonly seen in randomized control trial samples.

Additional significant predictors of greater DBP progress included older age, longer treatment, and lower impairment at or near episode initiation. This sample is characterized by significantly impaired youth, so it is likely that very few are in early stages of developing disruptive behaviors. In that context, younger clients in this sample might have achieved lower final average DBP progress ratings because they might reflect a higher rate of the early-onset and persistent form of disruptive behavior that is thought to be more difficult to treat (e.g., Beauchaine et al. 2010; Loeber and Hay 1997). Referral rate differences by age might also play a role. Youth referred to CAMHD services before adolescence might be exhibiting particularly acute and long standing DBP compared to older youth, who might qualify for services for additional or other concerns seen at lower rates in younger youth (e.g., legal difficulties, school refusal). Longer treatment episode length was also a significant predictor of final average progress rating on DBP targets. Youth who received < 180 days of treatment likely received fewer elements of the treatment service than did youth with at least 180 days of treatment, allowing them less time to learn skills in treatment and therefore less time to demonstrate treatment response. As expected more highly impaired youth were less responsive to treatment at least during the first 6 months of services. Preliminary analyses from this system of care suggest this pattern occurs across nearly all levels of care, from IHH services to hospitalization (Matro et al. 2017).

Limitations

There are several issues that might limit interpretation of these findings. This study utilized a community mental health sample of youth who received public mental health care from a single system, and findings might not generalize to other clinical populations. The diagnostic assessment process within the CAMHD system was not completely standardized, with both CAMHD doctoral staff and various contracted doctoral providers conducting the diagnostic assessments (CAMHD 2012). Youth in the depressed mood group who carried no disruptive behavior diagnosis might have differed in their patterns of symptom severity and improvement compared to youth in the same group with disruptive behavior disorder diagnoses. Data on the severity of disruptive behavior or other specific problem domains for each youth were not available, and future research might usefully track differential severity of problems across groups when examining how treatment focus is related to outcomes. Treatment process data were reported on a monthly basis, and the endorsement on a particular target does not exactly reflect the amount of time or focus that each target received over that time period. While the final analytic model included a measurement of treatment episode length that could account for some of the influence

of treatment quantity, it did not account for the number of treatment minutes or treatment sessions during that time, and more specific service data was not available. Youth ages in the sample were fairly broad, and treatment strategies for youth of different ages might have considerably varied. The regression model was intended to control for age effects even in context of the wide variety of ages in the sample. It is notable that only 136 youth out of the total sample of 613 (22.2%) were under the age of 12 at treatment episode start. Future research based in UC offers the opportunity to further examine age effects in therapy practice and outcomes, which can then help refine our models. Finally, self-report treatment process measures are always a risk. That said, the MTPS has shown excellent psychometrics and has facilitated meaning insights into community care practices and outcomes.

Nearly all of these limitations are inherent in “treatment as usual” or “community care” research. While such limitations make causal inferences impossible and results open to multiple interpretations, the need for understanding and learning from UC remains (Garland et al. 2010a; Kazdin 2015). Adding experimental control, while strengthening inferences, inherently alters UC. Having a way to describe UC and finding associations between clinical processes and client outcomes across large numbers of cases, even with all its limitations, adds a vital counter-voice to well-controlled research studies and strengthens the bridge between research and practice.

Future Directions

The most pressing need seems to be for research to reconcile the various findings related to mood problems and disruptive behavior treatment progress. Randomized controlled trials with highly impaired youth would be useful, as would community care studies utilizing disseminated and more routinized evidence-based packages. While transdiagnostic treatments are becoming more common (Barlow et al. 2011), there is a need to think critically about how best to treat youth with both internalizing and externalizing problems. Mood and DBP are highly comorbid (particularly in clinical samples), and determining the best way to help such youth is critical. We do know that in community care, there is a disproportionate focus on externalizing targets for comorbid youth, but we do not know whether and how this might affect outcomes (Milette-Winfrey and Mueller 2017). This study did not examine treatment progress on measures of depressed mood or more general internalizing problems, and future research might examine the effects of treatment focus on youth internalizing problems, ideally using valid and reliable measures of internalizing symptoms. It might also be useful to focus more on differential therapist effects in community-based services. Despite the notable variance

at this level, we were only able to examine two therapist variables, neither of which explained significant variance. Examining therapist treatment practices (e.g., specific treatment approaches), in addition to areas of treatment focus, might further explain outcome differences by diagnosis. Such findings could inform practice standards for potentially distinct manifestations of DBP. Lastly, and echoing the call by others, there is a need for much more systematic study of community care, both to better understand results from effectiveness trials and to generate new ideas suitable for experimental research. More careful and systematic examination of UC will bring a better balance to the research-practice bridge and will facilitate better practice, research, dissemination, and implementation.

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