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ORIGINAL ARTICLE

Is Irritability a Top Problem in Youth Mental Health Care? A Multi-informant, Multi-method Investigation

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Abstract

Irritability is often described as a common problem affecting youth referred for mental health services; however, little is known about the prevalence and nature of irritability as a focus of treatment. We examined assessment data from a diverse sample of youths ($N = 206$; ages 7–15; 52% male, 48% female; 33% White, 27% Black, 25% Latinx) referred for outpatient treatment of emotional and behavioral concerns. Caregivers and youths completed nomothetic (standardized checklist) and idiographic (free response) measures at intake. Irritability was identified as a top problem (TP) in 58% of cases, commonly reported by caregivers (38%), youths (42%), or both (23%)—rates that were significantly greater than those of other TP domains (depression, anxiety, ADHD, conduct, and defiance). Further analyses identified clinical correlates of irritability TPs, with results supporting the incremental utility of multiple informants and methods. Findings suggest that irritability is among the most common problems for which families seek youth treatment.

Keywords Irritability · Dysregulation · Idiographic assessment · Youth mental health

Introduction

Irritability, defined as an increased proneness to anger [1, 2], is a transdiagnostic phenomenon affecting children and adolescents (herein, "youth"). Although mild and transitory forms of irritability are normative, *severe irritability* is conceptualized as a problem of emotion dysregulation involving dysfunction of threat and reward systems [1]. Clinically, presentations of severe irritability may include aggressive outbursts, chronic irritable mood, and bouts of intense anger or severe distress, with variability across development and forms of psychopathology [3, 4]. Despite much progress in advancing the clinical science of youth irritability, more research is needed in order to better understand and address this important problem.

One key property of irritability is that it is transdiagnostic in psychiatric nosology, being present in over a dozen disorders affecting youth. Researchers have programmatically investigated youth irritability from several perspectives, including as a dimension of Oppositional Defiant Disorder (ODD) [4–6], as a syndrome/disorder of severe mood dysregulation [7, 8], and as a phenomenon of anger and reactive aggression [1, 2, 9]. Severe irritability is also common in—albeit not an essential feature of—conditions such as Attention-Deficit/Hyperactivity Disorder (ADHD) [10, 11], Autism Spectrum Disorder [12], depression, anxiety, traumatic stress, personality disorders, and sleep disturbance [1, 3]. Not surprisingly, conditions characterized by severe irritability are highly comorbid with other forms of psychopathology [13, 14]. Recently, chronic irritability has been incorporated into formal nosologies—as Disruptive Mood Dysregulation Disorder (DMDD) in the *Diagnostic and Statistical Manual* (DSM-5) [7], and as a subtype of ODD in the *International Classification of Disorders* (ICD-11) Mental and Behavioural Disorders [4]. There have also been special issues [15–18], books [19, 20], and scientific meetings—all part of a groundswell in the growing science of pediatric irritability.

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A familiar refrain in this burgeoning literature goes something like this: *Irritability is one of the most common concerns among clinically referred youths*. However, data to support this claim are surprisingly scarce. A review of relevant empirical studies (below) suggests that, although much knowledge has been gained, relatively little is known about how common severe irritability is in general clinical settings. Instead, statements in the literature (including in our own work) about the clinical prevalence of irritability tend to be extrapolated from research on related concerns (e.g., aggression, disruptive behavior) or inferred as a feature of many different problems and disorders. Relatively less is known about what irritability looks like in youth mental health care, including the fundamental question of how often it is a focus of treatment.

Prevalence of Irritability in Youth Mental Health Care

Most of the evidence relevant to the clinical prevalence of severe irritability can be broadly organized into two types of studies, largely distinguished by their recruitment and sampling strategies. First, research conducted with various community samples (e.g., [6, 21–24]) has shed light on the prevalence, phenomenology, course, and correlates of irritability *in the general population*. For example, Collishaw et al. [25] found that rates of adolescent-reported irritable mood symptoms increased substantially from 1986 to 2006 (from 12% to 21% for boys, and from 16% to 30% for girls) in nationally representative community samples in England. Although such findings are clearly valuable, these studies, by design, cannot speak to the rates and nature of irritability in clinical settings. Second, research conducted with specialized clinical samples has advanced knowledge of youth irritability from mechanistic, experimental, measurement, and case-controlled approaches. By necessity, these studies tend to use recruitment strategies and eligibility criteria *specifically targeted* at identifying youths with elevated irritability and mood problems [26–28], or with inclusion restricted to specified groups, like ADHD [11], bipolar disorder [29], or healthy controls. Thus, findings concerning the prevalence and nature of irritability from these studies may not generalize to everyday clinical settings. Research on youth irritability in general (i.e., nonspecialized) clinics is far more limited. Yet, this is precisely what is needed, as routine care settings are the context in which youth and families are mostly likely to seek treatment. We turn now to studies relevant to this question across various routine care contexts.

At the broad level, disruptive behavior problems (including irritability, anger, and aggression) are among the most common concerns for youth mental health treatment. Epidemiological data indicate that disruptive behavior disorders are not only one of the most prevalent problems in youth (20% lifetime prevalence for any ODD, CD, or ADHD) [30], they also have the highest rates of service utilization (60% for ADHD, and 45% for ODD or CD) [31]. These findings carry major implications for public health and systems of care. In the U.S., rates of youth outpatient visits for disruptive behavior disorder diagnoses far exceed those for other diagnostic areas (mood, anxiety, psychotic, etc.), accounting for up to 72% of child visits and 45% of adolescent visits [32]. In another study [33], outpatient records for 885 youth showed that externalizing problems were the most common *reason for referral* (rates of 35–45% for externalizing-only, as compared to 19–25% for internalizing-only), even though *diagnoses* suggested that internalizing conditions were more common. In addition to showing the centrality of externalizing problems, these findings suggest a discrepancy between the problems reported by families and the problems classified by clinicians. More research is needed to better understand externalizing problems and irritability as a focus of treatment. Research involving multiple assessment sources and methods may be particularly informative.

At higher levels of severity, irritability is a major reason for youth emergency department (ED) visits and inpatient stays. Several studies show that aggressive behavior, agitation, and disruptive behavior problems are among the most common diagnoses and problems contributing to ED visits [34–36], sometimes exceeding other problems such as suicide attempts and substance use. One chart review study found that 65% of inpatient-admitted 3- to 16-year-olds had a disruptive behavior disorder, far higher than other diagnoses like anxiety, depressive, and adjustment disorders (all < 30%) [37]. Similarly, national trends reveal that about 1 in every 5–6 youths discharged from community inpatient care had a principal diagnosis of a behavioral disorder, second only to depressive disorders [38].[1]

Only a few studies to our knowledge have specifically examined chronic irritability prevalence in general outpatient care settings. First, Drabick and Gadow [43] investigated ODD symptom subgroups in a large and diverse sample of youths ages 6–18 seeking services at an outpatient psychiatric center. They found that approximately 20–30% could be classified as having ODD-angry/irritable symptoms, 13–19% as having ODD-noncompliant-symptoms,

[1] Accuracy of clinical diagnoses warrants some attention here. Chronic irritability as a referral problem relates to the much-discussed increase in pediatric mood disorder diagnoses—especially pediatric bipolar disorder—seen in administrative data in the 1990s and 2000s [38–40]. Although more recent meta-analyses have confirmed that the true epidemiologic prevalence of pediatric bipolar disorder is not increasing [41], it is now commonly accepted that a major contributor to local upticks in pediatric bipolar disorder diagnoses was the convention of diagnosing severe irritability and outbursts in children and adolescents as bipolar disorder [4, 42].

and the remainder (53–67%) as non-ODD clinic controls with various other diagnoses. Second, Freeman and colleagues [44] analyzed intake assessment data drawn from 597 consecutive cases (ages 6–18) referred to a community outpatient clinic and found that 31% met criteria for DMDD and 50% for ODD. Lastly, although not an outpatient sample, Martin et al. found that 45% of young children (ages 4–6) referred to a hospital day treatment program would meet criteria for DMDD with relaxed age criteria [45]. Clearly, data suggest that irritability is a prevalent problem affecting youths referred for treatment, highlighting the need for more research.

Irritability as a Focus of Treatment

One question warranting closer investigation is this: *To what extent is irritability a focal problem for treatment*? Here, the perspective of youths and caregivers is important; only they can report what they are seeking treatment for. The identification of the focal problem is critical in part because comorbidity is the rule, not the exception [46]. Severely irritable youths typically have 3–4 diagnoses, cutting across the internalizing, externalizing, and neurodevelopmental domains [4, 47]. For the clinician, the mere presence of Problem X does not indicate that X should be the focus of treatment. Rather, there is likely a constellation of Problems X, Y, and Z, cutting across social, emotional, behavioral, academic, and physical health domains. One objective of the initial clinical assessment is to work with the family and develop specific goals and plans for treatment. Unfortunately, there is little evidence to inform this clinical decision-making process in the domain of irritability. The present study seeks to fill this gap.

To date, much of the research on youth irritability has used ad hoc item scales applied to existing data. Although strong measures of irritability exist [28, 48, 49], most are relatively new and not widely used in general clinical settings. But irritability maps onto dimensions of psychopathology that are routinely assessed, facilitating measurement via instruments including diagnostic tools for ODD [5, 6] and the Child Behavior Checklist and Youth Self-Report (CBCL/YSR) [50, 51]. Of relevance here, the three-item CBCL/YSR scales for *irritability* (stubborn/sullen/irritable, mood changes, tantrums/temper) and *defiance* (argues, disobeys-home, disobeys-school) show adequate psychometric properties in clinically referred youth [52].

In the present analysis, the CBCL/YSR irritability scale was one piece of the puzzle. However, as many clinical scientists have lamented [53], nomothetic measures offer only one perspective. Their chief limitation is that they provide the words and ask the patient to evaluate their experiences in relation to those standardized words; they do not ask the patient about what problems are their priority for treatment. To understand irritability *as a concern for treatment*, idiographic approaches are needed. In clinical work with youths and their parents or primary caregivers (hereafter, "caregivers"), one idiographic approach is to simply to ask (e.g., "What brings you in today?"). Translating this question into measurement-based care form, Weisz et al. [54] developed the Top Problems (TP) measure for identifying the top three concerns youths and caregivers would like to have addressed in treatment. A clinician can administer the TP first in a brief semi-structured interview format, to obtain the family's goals for treatment in their own words. The family's TPs can then be re-assessed repeatedly throughout treatment in a rating scale format measuring each TP's current severity. This scale has shown evidence of convergent, discriminant, and test–retest reliability, with incremental utility beyond nomothetic measures [54]. Several studies have used it to track change in treatment [55–57].

Of special interest here, caregivers' and youths' verbatim TP responses can be re-coded for research. The large majority of family-reported TPs map onto nomothetic items for internalizing, externalizing, and other problems in the CBCL/YSR [58]. Baseline assessment TP data can therefore be leveraged to gain a richer understanding of why caregivers and youths are seeking treatment. Such strategies have already contributed valuable knowledge to the clinical evidence base, demonstrating that in most instances there is an overwhelming lack of agreement among parent-child dyads [59] and parent-child-therapist triads [60] as to why they are seeking treatment. These findings map onto a larger body of evidence and clinical practices for using idiographic assessment to plan and monitor treatment of individualized target problems. Moreover, this approach could be especially promising in the area of youth irritability, given evidence of clinical outcomes varying by informant [47, 52]

The Present Study

The literature review above reveals pressing questions regarding youth irritability as a focus of treatment in general clinical settings, as well as some promising assessment approaches for investigating these questions. Thus, this study adopts a multi-method (idiographic, nomothetic) and multi-informant (caregiver, youth) approach to investigate the extent and nature of irritability as a TP in treatment-referred youth. Four main questions were examined:

1. How common is irritability as a TP in outpatient youth mental health treatment?
2. How common are irritability TPs relative to TPs in other problem areas?
3. What are the clinical and demographic correlates of irritability as a TP?

4. Do caregiver and youth reports of irritability TPs convey different information?

We anticipated that irritability would be present in a large percentage of cases per both informants; however, we had little empirical basis for predicting its frequency as a TP. Recognizing that irritability is defined as a proneness toward anger, characterized by emotion dysregulation and intrinsically associated with externalizing problems, we hypothesized that irritability TPs would be associated with relevant variables in these domains (i.e., correlated with standard measures of irritability, externalizing problems, emotional lability/negativity, poor anger coping, and anger dysregulation). Associations with attention problems, trauma history, internalizing problems, and demographics were assessed on an exploratory basis given their potential clinical relevance. Hypotheses were parallel for caregiver and youth data, with attention to convergence or divergence of results across informants.

Method

The sample included 206 youths ($M_{age} = 10.73$ years, $SD = 2.40$, range: 7–15; 52% male; 48% female) referred for treatment of various emotional and behavioral problems. Data were collected from four community outpatient mental health clinics serving a combination of urban, rural, and suburban communities in Connecticut. Baseline clinical assessments were conducted as part of a randomized effectiveness trial [57] evaluating implementation strategies for a modular, transdiagnostic, cognitive-behavioral therapy intervention [61]. Eligibility requirements included being 6–15 years of age and referred for mental health treatment. Some 210 youths were eligible, completed assessments, and provided informed parental consent and youth assent to participate. Specific inclusion criteria for the trial included having at least one elevated CBCL/YSR scale in areas related to anxiety, depression, trauma, or externalizing problems. Four cases (2%) with any missing TP or CBCL/YSR irritability data were removed for this analysis, yielding a final sample of $N = 206$.

All assessments were conducted separately with the treatment-referred youths and their caregivers, administered via phone by trained bachelor's-level research assistants (RAs). Caregivers completed a questionnaire covering demographic and background variables. Regarding racial/ethnic background, one-third (33%) of youths were identified by their caregivers as White, 27% were Black or African American, 25% were Hispanic or Latinx, 1% were Asian or Asian American, 13% were multiracial, and 1% were identified as other. About one-third (35%) reported an annual household income of $0-19k, followed by $20-39k (29%), $40-79k (19%), and $80k+ (12%); 5% did not respond. This study was approved by the institutional review boards of Harvard University and the Department of Children and Families of the State of Connecticut.

Measures

CBCL/YSR Irritability Scales

The CBCL and YSR [58] are parallel caregiver- and youth-report forms measuring youth emotional and behavioral problems at narrowband and broadband levels. In the present analysis, the CBCL/YSR were the basis of the coding system for caregiver- and youth-rated TPs, described below. Additionally, the CBCL and YSR were used to derive previously established irritability scales, comprised of three items: (86) stubborn/sullen/irritable, (87) mood changes, and (95) tantrums/temper. This three-item CBCL/YSR irritability scale has shown evidence of univariate structure, internal consistency, test–retest reliability, convergent and discriminant validity with scales, and criterion validity with diagnoses [50–52, 62]. Comparatively less work has been done with the YSR irritability, but available evidence suggests its properties are adequate but less robust than the CBCL [52]. Theoretically, these items are consistent with the prevailing conceptualization of irritability as a problem of emotion dysregulation, characterized by a heightened proneness to anger, with varied manifestations across development [42]. Accordingly, we used CBCL and YSR irritability items to examine prevalence of nomothetic irritability problems as endorsed by caregivers and youths (Aims 1–2); however, we focus only on CBCL irritability in analyses concerning correlates and outcomes of irritability (Aims 3–4). Internal consistency for CBCL/YSR irritability was within the acceptable range [63] for caregiver report ($\alpha = 0.64$) and youth report ($\alpha = 0.63$). Brief scales tend to have lower alphas simply as a result of having fewer items [64, 65].

Top Problems (TP)

The TP measure [54] provides an idiographic assessment of caregivers' and youths' biggest concerns for treatment. Trained bachelor's-level RAs interviewed caregivers and youths separately, asking them to identify their "top three" problems they would like to have addressed in treatment, to be used later for progress-monitoring. Baseline TP data from treatment-referred families were coded by two bachelor's-level raters using a system designed to translate TPs (idiographic, verbatim) into the items and scales of the CBCL/YSR (nomothetic, standardized). This coding system, described previously [54, 59, 60] reliably matches the large majority of caregiver- and youth-identified TPs into CBCL/YSR items. Each TP (e.g., "She can't control her anger") is

Table 1 Examples of Caregiver- and Youth-Reported Irritability Top Problems

CBCL/YSR irritability item code applied	Irritability-related top problems	
	Caregiver-report examples	Youth-report examples
86. Stubborn, sullen, irritable	"He is irritable at home and at school." "He doesn't accept 'no' for an answer."	"It's hard for me to be flexible." "I pout when I don't get my way."
87. Sudden mood changes	"He can't handle change." "She has emotional meltdowns."	"I can't control my sad feelings." "I get frustrated easily."
95. Tantrums or hot temper	"When she feels angry, she shuts down." "She throws temper tantrums when things don't go her way."	"I feel angry." "I have a temper with my dad."
Combination: 86, 87, or 89 plus other item code(s)	"He becomes aggressive when he's angry." (95 + 16 [cruelty, bullying, or meanness]) "She gets so upset and anxious she can't control her emotions." (87 + 50 [fearful or anxious] + 103 [unhappy, sad, or depressed])	"I get mad when my parents argue." (95 + 175 [relational code]) "I get annoyed and yell when people talk to me a lot." (86 + 68 [screams a lot])

Note. Examples are of top problems that were coded as matching one or more of the CBCL/YSR irritability item codes listed in the left column

coded to a CBCL/YSR item (e.g., [item 95] tantrums/temper) and any narrowband (e.g. Aggressive Behavior), broadband (e.g., Externalizing), and DSM-oriented (e.g., Oppositional-Defiant) scales to which that item belongs [58]. The protocol also accommodates TPs that embody multiple items (e.g., feels sad and angry) and those that do not match any items (e.g., parental divorce, bereavement). Here, we applied the coding to capture the entire breadth of families' reported TPs, with a special interest in **irritability TPs**—i.e., those TPs that mapped onto the three CBCL/YSR irritability items [52] noted above. Table 1 presents some examples of irritability TPs drawn from this sample. For comparison (Aim 2), we also examined TPs in clinically relevant CBCL/YSR DSM-oriented scales: Depression (13 items), Anxiety (9 items), Conduct (17 items), Attention-Deficit/Hyperactivity (7 items), and Defiance [52] (3 items). Due to the idiographic content of TP items, Cronbach's alpha is not appropriate; instead, kappa was used to quantify intercoder reliability of item content. Based on double coding of a randomly selected 49 cases, reliability was excellent for all TP codes at the general (caregiver/youth $\kappa = 0.87/0.91$), narrowband ($\kappa = 0.87/0.94$), and broadband ($\kappa = 0.86/0.94$) levels, including for irritability specifically ($\kappa = 0.95/0.98$).

Brief Problem Monitor (BPM)

The BPM [66] was administered to youths and caregivers as a focused measure of internalizing, externalizing, and attention problems. Derived from the larger CBCL/YSR item sets via item response theory and factor analyses, the BPM includes 6 or 7 of the highest-loading and most effective items in each problem area across informants. As such, the BPM functions well as a brief measure of internalizing, externalizing, and attention problems. Although less exhaustive than the CBCL/YSR, the BPM retains comparable psychometric properties and taps key facets of internalizing (anxiety, depression), externalizing (aggression, rule-breaking), and attention (inattention, hyperactivity-impulsivity). Because two of the BPM items (stubborn/sullen/irritable and tantrums/temper) overlap with CBCL/YSR irritability and externalizing item sets, all analyses with BPM externalizing data were conducted with and without those items included in scoring. Internal consistency was good for all BPM scales, with Cronbach's αs (caregiver/youth) as follows: six-item internalizing problems = 0.81/0.85, seven-item externalizing problems = 0.82/0.80, five-item externalizing problems = 0.76/0.75 (irritability items removed), and six-item attention problems = 0.81/0.74.

Emotion (Dys)regulation Measures

First, the Emotion Regulation Checklist (ERC) [67, 68] **Emotional Lability/Negativity** scale was used to measure difficulties regulating negative emotions. The ERC is a 24-item caregiver-report rating measure with two scales: emotion regulation and emotional lability/negativity. Caregivers respond on a 4-point scale (1 = *never* to 4 = *always*). Although the full ERC was given, only the 15-item emotional lability/negativity subscale showed acceptable internal consistency in this sample ($\alpha = 0.83$), with items such as "Is prone to anger outbursts" and "Exhibits wide mood swings." The 8-item emotion regulation subscale had less than adequate internal consistency ($\alpha = 0.55$) and was therefore excluded from analyses. Second, the **Anger Coping** and **Anger Dysregulation** scales from the Children's Emotion Management Scales (CEMS) were given as youth-report measures of emotion (dys)regulation. These scales are part of the larger CEMS suite measuring three regulation strategies (inhibition, dysregulation, coping) with respect to three unpleasant emotions (anger, sadness, worry) [69, 70].

Youths report how often they use different strategies to manage the given emotion, using a 3-point scale (1 = *hardly ever* to 3 = *often*). Anger coping and dysregulation were of special interest given that irritability is defined as an elevated proneness to anger [1, 2]. Example items include, "When I am mad, I can control my temper" (coping) and "I say mean things to others when I'm mad" (dysregulation). Internal consistency was acceptable for the four-item anger coping scale (α = 0.73) and satisfactory for the three-item anger dysregulation scale (α = 0.63).

Traumatic Stress Screen

The Trauma History Screen, already in use by partnering clinics, was used to form a variable representing whether the youth had experienced traumatic/stressful events [71]. A caregiver- and a youth-report version were administered, each listing 18 stressful events (e.g., "experienced a really bad accident," "was made to do something sexual," "someone physically hurt them"). Follow-up questions asked how often it occurred, and how much it affected them at the time and at present. For the present analyses, a **positive traumatic stress screen** was defined as the informant reporting that the youth experienced at least one stressful/traumatic event *and* reporting that it currently affects them at least *moderately* (3) on a 5-point scale (1 = *not at all* to 5 = *extremely*).

Analyses

To investigate the clinical prevalence of irritability-related TPs overall (Aim 1) and relative to other TP areas (Aim 2), we estimated their case-level frequency in the total sample ($N = 206$). Results report the number/percentage of youths for whom a particular item/problem was endorsed, both within each informant and in different informant combinations (both/and, either/or). Key results are reported with 95% confidence intervals [CIs] to serve as an index of estimate uncertainty and as a basis for comparison across groups and variables. Associations of irritability TPs with clinical and demographic variables (Aim 3) were evaluated through *t*-tests with Cohen's *d* effect sizes for continuous variables and χ^2 tests with Cramer's *V* effect sizes for categorical variables. Lastly, targeted convergent associations were probed more closely in a multivariate general linear model (Aim 4). Controlling for covariates, this model tested caregiver-, youth-, and caregiver- × youth-reported irritability TPs as predictors of CBCL irritability, ERC emotion lability/negativity, BPM externalizing problems, and CEMS anger coping and dysregulation, to evaluate the incremental utility of each informant's irritability TPs.

Results

How Common is Irritability as a Top Problem?

Irritability frequency data are presented in Table 2. Overall, 38.3% [95% CI: 31.7, 45.4] of caregivers and 42.2% [35.4, 49.3] of youths identified an idiographic TP related to irritability as one of their top three concerns. In other words, whether one is asking the caregivers or the youths, about 2 in 5 identified irritability as a focal concern for treatment according to idiographic methods. Nomothetically, a different story emerged. Using the CBCL/YSR, 62.1% [55.1, 68.8] of caregivers and 42.2% [35.4, 49.3] of youths endorsed at least one CBCL/YSR irritability item as 2 = *very/often true*.[2]

To better understand multi-*informant* patterns, we examined how often either informant reported irritability problems (either/or), or if both agreed on the positive result (both/and). Idiographically, irritability was identified as a TP by at least one informant in 57.8% [50.7, 64.6] of cases, and it was identified as a TP by both informants in 22.8% [17.3, 29.2]. Nomothetically, 72.8% [66.2, 78.8] of cases endorsed a CBCL/YSR irritability item per at least one informant, and 31.6% [25.3, 38.4] per both informants. Inter-informant agreement was modest for both idiographic irritability TPs (κ = 0.28) and for nomothetic CBCL/YSR irritability (κ = 0.21).

To better understand multi-*method* patterns, we examined how often irritability problems were identified via the TP approach or the CBCL/YSR approach (either/or), or by both methods (both/and). Among caregivers, irritability was identified via at least one method in 72.8% [66.2, 78.8] of cases and by both methods in 27.7% [21.7, 34.3]. Among youths, irritability was identified by at least one method in 59.2% [52.2, 66.0] of cases and by both methods in 25.2% [19.5, 31.7] of cases. Cross-method (nomothetic-idiographic) agreement was low for caregivers (κ = 0.15) and higher for youths (κ = 0.30).

Aggregating across *informants* and *methods* via the most liberal either/or approach (i.e., any informant, any method), irritability rates were as high as 83.0% [77.2, 87.9]. By the most conservative method (both informants, both methods) this rate dropped to 11.7% [7.6, 16.8]. The more moderate

[2] Various approaches have been used to consolidate 0–1-2 response scales. One alternative approach is to treat any non-zero response as a positive result, collapsing 1 (*sometimes*) and 2 (*very/often*) into the same category. However, because we were interested in problems considered severe and relevant for treatment, we focused on the highest response category. To use the non-zero response approach would result in irritability items being considered endorsed in a large majority of cases: 98.1% [95.1, 99.5] of cases endorsed a CBCL/YSR irritability item at 1 or 2 per either informant, and 77.7% [71.4, 83.2] per both informants.

Table 2 Rates of Irritability Problems Identified via Multiple Methods and Informants

	Item or item code	Idiographic (TP) problem frequency		Nomothetic (CBCL/YSR) problem frequency						Multiple methods: TP, CBCL/YSR[c]	
		Present (%)		Response category (%)				*M* (*SD*)	Range	Either/or (%)	Both/and (%)
		No	Yes	0	1	2	1 or 2				
Caregiver report											
	86. Stubborn	95.6	4.4	20.4	35.4	44.2	79.6	1.24 (0.77)	0–2	46.6	1.9
	87. Mood	86.9	13.1	20.4	47.1	32.5	79.6	1.12 (0.72)	0–2	40.8	4.9
	95. Temper	73.3	26.7	25.7	34.5	39.8	74.3	1.14 (0.80)	0–2	52.4	14.1
	Any irritability	61.7[a]	**38.3**[a]	7.3	66.5	**62.1**	92.7	3.50 (1.75)[b]	0–6[b]	**72.8**	**27.7**
Youth report											
	86. Stubborn	96.6	3.4	42.7	37.9	19.4	57.3	0.77 (0.75)	0–2	21.4	1.5
	87. Mood	94.7	5.3	39.3	39.8	20.9	60.7	0.82 (0.76)	0–2	25.7	0.5
	95. Temper	64.6	35.4	40.3	34.5	25.2	59.7	0.85 (0.80)	0–2	44.7	16.0
	Any irritability	57.8[a]	**42.2**[a]	17.0	67.5	**42.2**	83.0	2.43 (1.75)[b]	0–6[b]	**59.2**	**25.2**
Multiple informants: caregiver, youth											
	Either/or	42.2	**57.8**	22.3	88.8	**72.8**	98.1	–	–	**83.0**	**47.6**
	Both/and	77.2	**22.8**	1.9	45.1	**31.6**	77.7	–	–	**42.7**	**11.7**

Note. Figures in bold are interpreted as the main indicators of what percentage of cases positively identified irritability as a problem, broken down across different informants (caregiver, youth) and methods (idiographic, nomothetic), and different combinations thereof. Kappa coefficients and 95% confidence intervals for these estimates are reported in text

[a]Represents the caregiver- and youth-identified irritability TP groups used in subsequent analyses

[b]Scale *M* (*SD*) and range

[c]These columns represent the percentage of the sample reporting that the row variable is present by according to two criteria, TP = "Yes" and CBCL/YSR = "2," with the criteria combined in different ways (either/or, both/and)

combinatorial approaches produced similar estimates (both-methods, either-informant = 47.6% [40.6, 54.6]; both-informants, either-method = 42.7% [35.9, 49.8]), again coalescing at around 2 in 5.

How Does Irritability Compare to Other Top Problem Areas?

Next, we examined the frequency of irritability-related TPs identified via caregiver- and/or youth-report as compared to the rates of TPs in other clinical areas identified through corresponding methods. As shown in Fig. 1, rates of irritability-related TPs (57.8% "any") exceeded those identified in other TP areas, including defiance, depression, anxiety, ADHD, and conduct problems (35.4–43.7% "any"). This pattern was consistent across all informants and combinatorial methods, underscoring the high frequency of irritability-related concerns as an important focus for treatment. The 95% CIs for irritability TPs (reported above) did not overlap with any of the corresponding point estimates for other TP areas. Thus, irritability problems were clearly the most common TP, identified at a significantly greater rate than all other TP areas.

What are the Clinical Correlates of Irritability Top Problems?

As shown in Table 3, when caregivers *or* youths reported an irritability-related TP, this was generally linked to higher scores on standard scales for irritability, emotional lability/negativity, anger dysregulation, poor anger coping, and externalizing problems (ds = 0.31–1.26). Caregiver- and youth-reported attention problems were also linked to irritability TPs per youth-report (ds = 0.39–0.46) but not by caregiver-report (ds = 0.08–0.20). Across informants, irritability TPs were unassociated with internalizing problems, traumatic stress screen, race/ethnicity, age, gender, or family income. All significant group differences on measures remained robust when re-estimated controlling for demographic variables. Overall, irritability TPs were associated with hypothesized clinical correlates (irritability, externalizing problems, emotional lability/negativity, and anger coping and dysregulation), while also yielding other interesting patterns of significant and nonsignificant links with other variables.

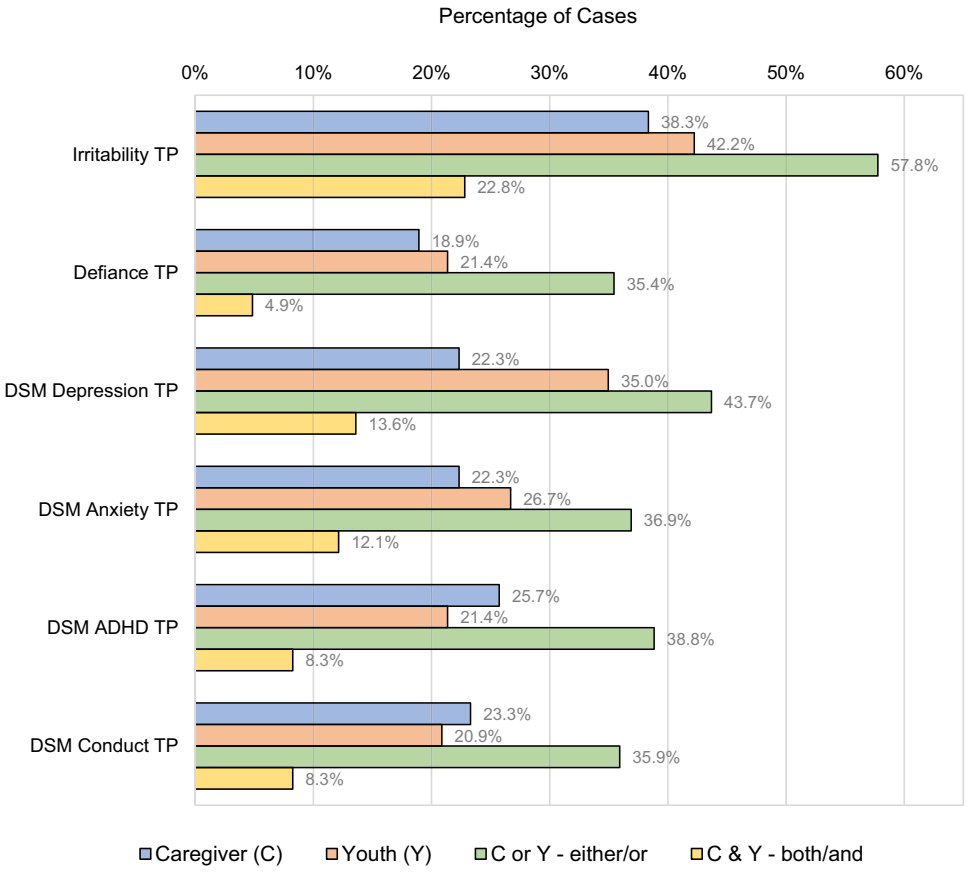

Fig. 1 Percentage of Cases Reporting a Top Problem for Treatment in Various Problem Areas. *Note.* Totals sum over 100% because participants could report multiple problems (up to 3) across different scale areas. TP = top problems. DSM = CBCL/YSR DSM Problem Scales

Do Caregiver and Youth Reports Convey Different Information?

Lastly, the associations of irritability TPs with clinically relevant correlates were further explored in a multivariate general linear model. Controlling for age, gender, race/ethnicity, and family income, this model tested direct and interacting effects of caregiver- and youth-identified irritability TPs on CBCL irritability, emotional lability/negativity, anger coping, anger dysregulation, and caregiver- and youth-reported externalizing problems. Results are presented in Fig. 2 as estimated mean scores (and 95% CIs) on each measure as a function of whether an irritability TP was identified by the youth (yes or no) and/or the caregiver (yes or no). This model accounted for a significant portion (14–20%) of the variance in all six correlates.

Three significant or marginal interactions (i.e., caregiver irritability TP × youth irritability TP) were detected: CBCL irritability ($F = 4.87$, $p < 0.05$), emotional lability/negativity ($F = 3.27$, $p < 0.10$) and BPM-C externalizing ($F = 2.69$, $p = 0.10$). As shown in Fig. 2 (see top left panels), these showed that when an irritability TP was identified by *anyone* (youth, caregiver, or both), this was associated with similarly high levels of the outcome variable, CBCL-irritability, emotional lability/negativity, and BPM-C externalizing. It was only when nobody endorsed irritability as a TP that these scores were relatively lower.[3]

For the other three outcomes (bottom right of Fig. 2), only main effects were detected. Caregiver-report ($F = 6.55$, $p < 0.05$) and youth-report ($F = 10.47$, $p < 0.01$) of irritability TPs both predicted BPM-Y externalizing problems, whereas only youth-report predicted anger coping ($F = 12.34$, $p < 0.001$; caregiver, *ns*) and anger dysregulation ($F = 13.62$, $p < 0.001$; caregiver, *ns*). In other words, the patterns of results on BPM-Y and CEMS were explained entirely by *additive* informant effects for BPM-Y externalizing problems and *youth-specific* informant effects for the anger variables on the CEMS. Taken together, this mixture of interactions and main effects suggests that no single informant's identification of irritability as a TP could replace the other's. Rather, both caregiver- and self-reported TPs each provide different and incrementally useful information about youth irritability, emotional lability/negativity, externalizing problems, anger coping, and anger dysregulation.

[3] Against this backdrop of interactions for the first three variables, informant-specific main effects for irritability TPs remained: caregiver ($F = 5.93$, $p < .05$) and youth ($F = 5.69$, $p < .05$) report played a role in predicting CBCL-irritability; caregiver marginally ($F = 3.22$, $p < .10$) and youth ($F = 7.15$, $p < .01$) reports predicted emotional lability/negativity; and caregiver ($F = 3.20$, $p < .10$) and youth ($F = 3.84$, $p < .10$) both marginally predicted BPM-C externalizing problems.

Table 3 Clinical and Demographic Correlates of Caregiver- and Youth-Identified Irritability Top Problems

Dependent variable	Caregiver-reported irritability top problem				Youth-reported irritability top problem			
	No ($n=127$)	Yes ($n=79$)	Group difference		No ($n=119$)	Yes ($n=87$)	Group difference	
	M (*SD*)	*M* (*SD*)	*t* (*df*=204)	*d*	*M* (*SD*)	*M* (*SD*)	*t* (*df*=204)	*d*
CBCL Irritability[a]	3.15 (1.80)	4.06 (1.51)	−3.76***	0.52	3.13 (1.80)	4.00 (1.55)	−3.61***	0.49
ERC-C Emotional Lability/Negativity[a]	31.54 (8.12)	34.63 (7.13)	−2.78**	0.85	30.81 (7.55)	35.36 (7.61)	−4.26***	1.26
CEMS-Y Anger Coping[a]	8.27 (2.11)	7.38 (2.32)	2.83**	0.40	8.51 (2.21)	7.13 (2.01)	4.62***	0.62
CEMS-Y Anger Dysregulation[a]	5.23 (1.66)	5.75 (1.66)	−2.18*	0.31	5.02 (1.55)	5.99 (1.69)	−4.28***	0.58
BPM-C Internalizing	4.08 (3.00)	3.68 (3.07)	0.91	0.13	3.97 (3.16)	3.86 (2.85)	0.26	0.04
BPM-C Externalizing[a,b]	5.21 (3.56)	6.62 (3.33)	−2.82**	0.40	5.05 (3.44)	6.71 (3.46)	−3.42***	0.47
BPM-C Attention	5.42 (3.41)	5.70 (3.29)	−0.58	0.08	4.97 (3.40)	6.29 (3.17)	−2.83**	0.39
BPM-Y Internalizing	3.38 (3.18)	3.01 (3.17)	0.80	0.12	3.19 (3.22)	3.30 (3.13)	−0.24	0.03
BPM-Y Externalizing[a,b]	3.43 (3.05)	5.05 (3.26)	−3.61***	0.50	3.23 (3.09)	5.18 (3.06)	−4.51***	0.61
BPM-Y Attention	4.69 (3.03)	5.28 (2.75)	−1.39	0.20	4.34 (2.99)	5.70 (2.69)	−3.36***	0.46
Age in years	10.95 (2.40)	10.38 (2.37)	1.67	0.02	10.82 (2.51)	10.61 (2.25)	0.63	0.09
	n (%)	*n* (%)	χ^2 (*df*)	*V*	*n* (%)	*n* (%)	χ^2 (*df*)	*V*
THS-P = positive[c] (else negative)	72 (56.7)	41 (51.9)	0.45 (1)	0.05	67 (56.3)	46 (52.9)	0.24 (1)	0.03
THS-Y = positive[c] (else negative)	52 (40.9)	40 (50.6)	1.85 (1)	0.09	52 (43.7)	40 (46.0)	0.11 (1)	0.02
Gender = male (else female)	56 (47.1)	52 (59.8)	2.36 (1)	0.05	56 (47.1)	52 (59.8)	3.26 (1)	0.13
Race/ethnicity			5.39 (3)	0.16			2.27 (3)	0.11
White	38 (29.9)	29 (36.7)			40 (33.6)	27 (31.0)		
Black/African American	33 (26.0)	23 (29.1)			29 (24.4)	27 (31.0)		
Latinx/Hispanic	39 (30.7)	13 (16.5)			29 (24.4)	23 (26.4)		
Asian/Asian American[d]	2 (1.6)	0 (0.0)			2 (1.7)	0 (0.0)		
Multiracial[d]	15 (11.8)	11 (13.9)			18 (15.1)	8 (9.2)		
Other[d]	0 (0.0)	3 (3.8)			1 (0.8)	2 (2.3)		
Family income (*n*, %):			0.99 (3)	0.07			1.92 (3)	0.09
$0-20k	47 (39.5)	26 (33.8)			39 (34.5)	34 (41.0)		
$20-39k	33 (27.7)	26 (33.8)			38 (33.6)	21 (25.3)		
$40-79k	24 (20.2)	15 (19.5)			21 (18.6)	18 (21.7)		
$80k+	15 (12.6)	10 (13.0)			15 (13.3)	10 (12.0)		

Note. *CBCL:* Child Behavior Checklist, *ERC:* Emotion Regulation Checklist, *CEMS:* Children's Emotion Management Scales, *BPM:* Brief Problem Monitor, *THS:* Trauma History Screen, *C:* caregiver report, *Y:* youth report

[a]Denotes hypothesized convergent validity variables for irritability TPs

[b]Tested with and without two irritability items included and results did not change; standard scoring is reported here

[c]Positive trauma history screen = a report of youth experiencing at least one stressful/traumatic event that currently affects them at least "moderately

[d]Groups were combined for chi square test due to small cell sizes

*$p<.05$

**$p<.01$

***$p<.001$

Discussion

This study investigated the prevalence and nature of severe irritability as a top problem (TP) among treatment-referred youths in community outpatient clinics. Irritability was identified as a TP for treatment in 58% of cases, commonly reported by caregivers (38%), youths (42%), or both (23%). Strikingly, the clinical prevalence of irritability, identified via the idiographic TP method, exceeded that of TPs in all other problem areas (e.g., anxiety, depression). Caregivers and youths provided incrementally useful information about irritability as a TP. These findings lend needed support and precision to statements that are routinely made in the literature [1, 3, 4] characterizing severe irritability as a common problem among clinically referred youth. Results also extend conclusions drawn from research samples into the

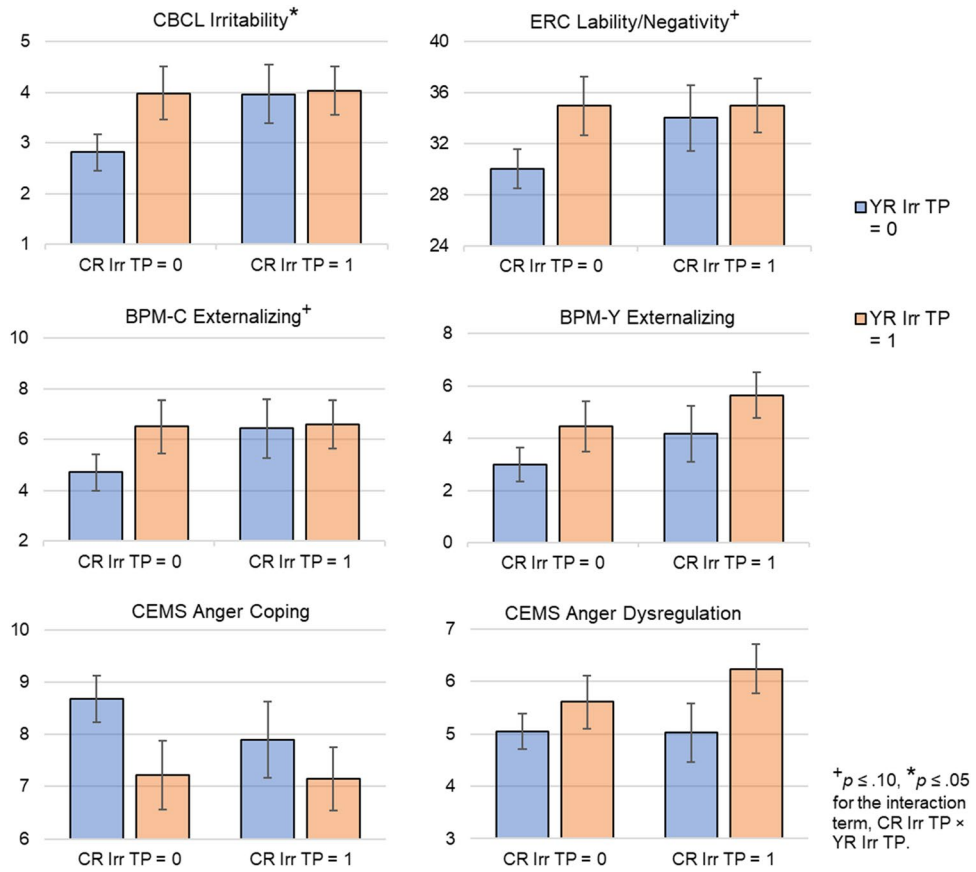

Fig. 2 Associations of Caregiver- and Youth-Reported Irritability TPs with Convergent Correlates. *Note.* Charts show associations of caregiver-reported irritability top problems (CR Irr TP; 1 = present, 0 = absent) and youth-reported irritability top problems (YR Irr TP; orange = present, blue = absent) with predicted mean scores on related variables. Error bars are 95% confidence intervals. Model controls for age, gender, race/ethnicity, and family income. Overall, when youths or caregivers report an irritability-related TP, this is linked to higher scores on standard measures of irritability, emotional lability/negativity, anger dysregulation, poor anger coping, and externalizing problems. However, the incremental utility of *youth*-reported irritability TPs in some of these associations may depend on whether a *caregiver*-reported irritability TP is present (and vice versa). Thus, each informant's report of irritability TPs seems to offer unique and useful information about these correlates, perhaps especially in the absence of irritability TPs from the other informant

more generalizable domain of community outpatient care. These findings carry those inferences one step further, showing that severe irritability is not just *a* common concern in treatment—it is quite often *the* focal concern.

Although the TP measure [54] and coding procedures [54, 59, 60] already stand on a great deal of empirical support, the overall pattern of results lends additional support for the reliability, validity, and incremental utility of this approach to assessing TPs generally and in the realm of irritability. The idiographic TP approach converged around estimates of ~ 40% for both caregivers and youths identifying irritability-related problems as their TPs. In contrast, the nomothetic CBCL/YSR approach yielded inconsistent estimates that diverged from the other informant (e.g., 62% caregiver-report vs. 42% youth-report) or the other method (e.g., 62% caregiver-nomothetic vs. 38% caregiver-idiographic). The finding irritability was identified as a TP by at least one informant in 3 of 5 cases aligns with past research showing the prominence of disruptive mood and behavior problems in outpatient service settings [31–33, 44]. However, a better understanding can be obtained by examining the variability behind these numbers.

Some of this variability is not surprising. For example, youths tend to report lower severity on nomothetic measures compared to caregivers [52]. However, our analyses revealed interesting findings about informants' contributions via idiographic measures. First, caregivers and youths often disagreed with one another about whether irritability was a top problem: in about 23% of cases they agreed yes, it was; in about 42% of cases they agreed no, it was not; and in the remaining 35% of cases they disagreed, with either the caregiver or the youth solely identifying irritability as a TP. This disagreement aligns with prior research showing modest parent–child agreement generally [72], and specifically

in agreeing upon a problem for treatment [59]. Our results suggest that this disagreement is meaningful; caregivers' and youths' identification of irritability TPs each contributed different and incrementally useful information about associations with irritability and other theoretically related constructs (e.g., anger dysregulation). Thus, assessments that allow the youth and caregiver to express problems in their own words seem especially valuable.

Indeed, this value of irritability TP data is evident in its associations with hypothesized correlates: As expected, irritability TPs were linked to emotional lability/negativity, anger dysregulation, poor anger coping, nomothetic irritability, and multi-informant externalizing problems. At the same time, irritability TPs were unassociated with essentially all variables not directly related to irritability. The lack of association with internalizing problems bears special mention given results supporting this association longitudinally and cross-sectionally [1, 4]. It may be that irritability *can occur as a symptom* associated with a host of problems and disorders; but it does not follow that irritability *does occur as the core problem* in most cases, with the possible exception of overt externalizing psychopathology. For example, the fact that irritable mood is one of the DSM-5 criteria for youth depression does not render irritable mood as necessary or sufficient for the diagnosis. However, chronic irritability and outbursts of anger/ aggression would most likely be considered part of the externalizing spectrum or DMDD. Similarly, the lack of association with traumatic stress suggests that irritability TPs are not necessarily linked to areas of psychopathology that are not essentially linked to irritability. Interestingly, attention problems were associated with irritability TPs by youth-report but not caregiver-report. This finding also points to the importance of multiple informants in clinical and research assessments of irritability and ADHD symptoms.

Importantly, there were no significant differences in irritability TP frequency across racial/ethnic, socio-economic, age, or gender groups in this diverse community-referred sample. Thus, it may be that the combination of irritability (as a problem) and the multi-informant TP (as a measure for assessing it) might be somewhat less susceptible to sociodemographic biases in mental health assessment data observed in other samples and via other methods. Additionally, irritability TPs were never associated with *lower* levels of symptoms or problems of any kind. This is notable because our focus on irritability TPs does not necessarily select for more severe cases. All participants were asked to identify three TPs, and in some cases one of those problems was irritability-related; when this was not the case, it could have been linked to anything else of any problem type or severity. Overall, groups formed based on irritability TPs tend to show the pattern of hypothesized differences where expected, and no associations with demographics or other problem areas, thus supporting specificity and convergent/ divergent validity.

Although we expected irritability TP prevalence to be high, its prevalence relative to other TP areas was striking. When identified via the idiographic TP method, the frequency of irritability consistently exceeded that of TPs in all other relevant problem areas (e.g., anxiety, depression, ADHD, conduct). These findings are even more notable because they stand counter to some key realities. First, considering that irritability had only three items (far fewer than other DSM areas, with 7–17 items), the high rate of irritability TPs cannot be attributed to simply having a higher number of indicators. Second, considering that the larger study and the original coding system were designed to capture broad youth emotional and behavioral problems (encompassing anxiety, depression, conduct/defiance, traumatic stress, and comorbidities) without a specific focus on irritability, the high rate of irritability TPs cannot be explained as a direct function of study design choices. For example, participants were not recruited, screened, or oversampled for irritability, or even other categories often seen in this literature (e.g., mood disorders specialty clinics, diagnostic subgroups). Finally, considering the pattern of results across caregivers, youths, as well as TP and CBCL/YSR, it is unlikely that the high rates of irritability TPs can be explained by informant or measure. These considerations address some potential concerns and are consistent with our central finding: Irritability is a common focal concern among youths referred for treatment.

Limitations and Future Directions

Some limitations should be noted. First, the sample was drawn from community outpatient clinics, so it would be important to replicate this study in other settings such as inpatient units and schools to determine the extent to which the findings are generalizable. Additionally, this is a secondary analysis of baseline data from an effectiveness trial. As a result, irritability was assessed broadly, without attention to different types or components of irritability, or other variables (e.g., diagnoses) of possible interest. Our approach to measuring CBCL/YSR irritability and irritability as a top problem is limited in that it relies on the item content from only three CBCL/YSR items (86, 87, 95) which were not originally designed to measure irritability. It will be important for future research to identify differences in the prevalence of various irritability-related presentations in youth, and how irritability may manifest in different populations. Evidence suggests the importance of considering teacher reports of irritability, in addition to parent and child [43, 73–75]. Other important avenues for future research include better differentiating phasic vs. tonic irritability [76–80] and

considering possible difference in irritability relating to race, ethnicity, and gender [81].

Overall, this study extends the clinical evidence base for youth irritability, demonstrating that irritability is a common TP identified by youths and caregivers. Put differently, many youths and caregivers in outpatient mental health settings express a wish that treatments and treatment plans should be designed to address irritability. Sensitivity to consumer concerns would argue for doing just that. However, more research is needed to advance the precision of assessment and to further our understanding of effective, personalized treatment for severe irritability [47, 82, 83]. The irritability TPs reported in this sample were not linked to internalizing problems or traumatic stress screens, but they were linked to measures of irritability, emotion dysregulation, and externalizing problems across multiple informants. Treatment research may benefit from including caregivers and youths and by incorporating a focus on emotion regulation and externalizing problems. Regarding assessment, these findings would not have been possible without multi-method and multi-informant approaches. Findings demonstrate the utility of including idiographic approaches alongside more standard nomothetic assessment methods, to gain a richer and more actionable understanding of families' concerns for treatment.

Summary

This study investigated the prevalence and nature of severe irritability as a focal problem in a diverse sample of treatment-referred youth. Data drawn from intake assessments using multi-informant (caregiver, youth) and multi-method (idiographic, nomothetic) approaches were coded and analyzed to understand what families were reporting as their top problems for treatment. Results showed that irritability was identified as a top problem for treatment in most clinical cases (58%), commonly reported by caregivers (38%) and youths (42%), if not both (23%). Per all informants and combinatorial approaches, irritability was identified significantly more often than problems in other areas—including depression, anxiety, ADHD, conduct, and defiance. In addition, caregivers' and youths' reports of irritability top problems showed evidence of convergent validity and incremental utility via their associations with hypothesized correlates (CBCL irritability, externalizing problems, and measures of emotion dysregulation); however, they were largely unassociated with demographic and clinical variables not directly related to irritability. Findings suggest that irritability may be among the most common youth problems for which families seek mental health services. To improve the accurate identification of irritability and other target problems for treatment, it is important for clinicians and researchers to conduct assessments using multiple informants and multiple methods, ideally including both nomothetic and idiographic approaches.

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Declarations

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

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

Research Involving Human Rights and Animal Participants Portions of this research were presented at the 3rd Meeting of the Congress on Pediatric Irritability and Dysregulation, Burlington, Vermont.

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

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