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Psychiatric comorbidity of developmental trauma disorder and posttraumatic Stress disorder: findings from the DTD field trial replication (DTDFT-R)

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ABSTRACT
Background: Developmental Trauma Disorder (DTD) has extensive comorbidity with internalizing and externalizing disorders distinct from posttraumatic stress disorder (PTSD).
Objective: To replicate findings of DTD comorbidity and to determine whether this comorbidity is distinct from, and extends beyond, comorbidities of PTSD.
Method: DTD was assessed by structured interview, and probable *DSM-IV* psychiatric disorders were identified with KSADS-PL screening modules, in a multi-site sample of 271 children (ages 8–18 years old; 47% female) in outpatient or residential mental health treatment for multiple (*M* = 3.5 [SD = 2.4]) psychiatric diagnoses other than PTSD or DTD.
Results: DTD (*N* = 74, 27%) and PTSD (*N* = 107, 39%) were highly comorbid and shared several *DSM-IV* internalizing and externalizing disorder comorbidities. Children with DTD with or without PTSD had more comorbid diagnoses (*M* = 5.7 and 5.2 [SD = 2.4 and 1.7], respectively) than children with PTSD but not DTD (*M* = 3.8[SD = 2.1]) or neither PTSD nor DTD (*M* = 2.1 [SD = 1.9]), $F[3,267] = 55.49$, $p < .001$. Further, on a multivariate basis controlling for demographics and including all potential comorbid disorders, DTD was associated with separation anxiety disorder, depression, and oppositional defiant disorder after controlling for PTSD, while PTSD was associated only with separation anxiety disorder after controlling for DTD. Both DTD and PTSD were associated with suicidality.
Conclusions: DTD is associated with psychiatric comorbidity beyond that of PTSD, and DTD warrants assessment for treatment planning with children in intensive psychiatric services.

HIGHLIGHTS
• Replicating previous findings, Developmental Trauma Disorder (DTD) had extensive psychiatric disorder comorbidity, including with separation anxiety disorder, depression, and oppositional defiant disorder independent of PTSD.
• DTD represents a novel diagnosis for children with complex psychiatric comorbidities.

Comorbilidad psiquiátrica del trastorno de trauma del desarrollo y del trastorno de estrés postraumático: Hallazgos de la Replicación del ensayo de campo DTD (DTDFT-R, en sus siglas en inglés)

Antecedentes: El Trastorno por Trauma del Desarrollo (TTD) tiene una amplia comorbilidad con trastornos internalizantes y externalizantes distintos del trastorno de estrés postraumático (TEPT).
Objetivo: Replicar los hallazgos de la comorbilidad del TTD y determinar si esta comorbilidad es distinta y se extiende más allá de las comorbilidades del TEPT.
Método: Se evaluó el TTD mediante una entrevista estructurada, y se identificaron probables trastornos psiquiátricos del DSM-IV con módulos de detección KSADS-PL, en una muestra multicéntrica de 271 niños (de 8 a 18 años de edad; 47% mujeres) en tratamiento en salud mental ambulatorio o residencial por múltiples (*M* = 3,5 [SD = 2,4]) diagnósticos psiquiátricos distintos del TEPT o el TTD.
Resultados: El TTD (*N*=74, 27%) y el TEPT (*N*=107, 39%) fueron altamente comórbidos y compartían varias comorbilidades de trastornos internalizantes y externalizantes del DSM-IV. Los niños con TTD con o sin TEPT tenían más diagnósticos comórbidos (*M* = 5,7 y 5,2 [SD = 2,4 y 1,7], respectivamente) que los niños con TEPT pero sin TTD (*M* = 3,8 [SD = 2,1]) o sin TEPT ni TTD (*M* = 2,1 [SD = 1,9]), $F[3,267] = 55,49$, $p < .001$. Además, en una base multivariante que controlaba los datos demográficos e incluía todos los posibles trastornos comórbidos, el TTD se asoció con el trastorno de ansiedad por separación, la depresión y el trastorno oposicionista desafiante después de controlar el TEPT, mientras que el TEPT se asoció sólo con el trastorno de ansiedad por separación después de controlar el TTD. Tanto el TTD como el TEPT se asociaron con suicidalidad.
Conclusiones: El DTD se asocia con comorbilidad psiquiátrica más allá del TEPT, y el DTD justifica una evaluación para la planificación del tratamiento con niños en servicios psiquiátricos intensivos.

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Abbreviations: DSM: American Psychiatric Association Diagnostic and Statistical Manual; K-SADS-PL: Kiddie schedule for Affective disorders/Schizophrenia Present/Lifetime.

发育性创伤障碍和创伤后应激障碍的精神病并发症:DTD现场试验重复 (DTDFT-R) 的发现

背景: 发展性创伤性障碍 (DTD) 与创伤后应激障碍 (PTSD) 不同, 与内化和外化障碍广泛并发症。

目的:重复DTD并发症的发现, 确定该并发症是否有别于和更广泛于PTSD并发症。

方法: 在一个除PTSD或DTD以外有多种精神病学诊断 (*M* = 3.5 [SD = 2.4]), 在门诊或住院接受心理治疗的271名儿童患者的多地点样本 (8至18岁; 女性47%) 中, 使用结构化访谈评估DTD, 并通过KSADS-PL筛查模块确定可能的DSM-IV精神障碍。

结果: DTD (*N* = 74, 27%) 和PTSD (*N* = 107, 39%) 高度共病, 并共享一些DSM-IV内化和外化并发症。有或无PTSD的DTD患者儿童 (分别为*M* = 5.7和5.2 [SD = 2.4和1.7]) 比患有PTSD但无DTD的儿童 (*M* = 3.8 [SD = 2.1]) 或均无PTSD和DTD的儿童 (*M* = 2.1 [SD = 1.9]) 的并发症诊断率更高 (*F* [3,267] = 55.49, *p*<.001)。此外, 在控制人口统计学并纳入所有潜在并发症的多变量基础上, 控制PTSD后, DTD与分离焦虑障碍, 抑郁和对立反抗性障碍相关, 而控制DTD后, PTSD仅与分离焦虑障碍相关。DTD和PTSD都与自杀相关。

结论: DTD与除PTSD的精神病并发症外的精神障碍相关, 并且需要对重症精神病儿童的治疗计划进行DTD评估。

Children who experience both traumatic victimization (e.g. maltreatment, exploitation, violence) and fundamental disruptions in their attachment relationships with primary caregivers are at risk for psychiatric (internalizing) and behavioural (externalizing) disorders that extend beyond, posttraumatic stress disorder (PTSD) (Bremness & Polzin, 2014; Ford, Spinazzola, van der Kolk, & Grasso, 2018; Hansen, Hyland, Armour, Shevlin, & Elklit, 2015; Khamis, 2019; Lyons-Ruth & Brumariu, 2020; Ma & Li, 2014; McLaughlin, Sheridan, & Lambert, 2014; Murphy, Elklit, Dokkedahl, & Shevlin, 2016; Spinazzola, van der Kolk, & Ford, 2018; Stolbach et al., 2013; van der Kolk, Ford, & Spinazzola, 2019; Villalta, Smith, Hickin, & Stringaris, 2018; Zhang, Zhang, & Ding, 2019). As a result, a transdiagnostic framework that includes but extends beyond PTSD has been advocated to identify the psychopathological sequelae and mechanisms associated with childhood adversity (Aldao, Gee, De Los Reyes, & Seager, 2016; Beauchaine & Cicchetti, 2019; Conway, Raposa, Hammen, & Brennan, 2018; Heleniak, Jenness, Stoep, McCauley, & McLaughlin, 2016; McLaughlin, Colich, Rodman, & Weissman, 2020; Wade, Zeanah, Fox, & Nelson, 2020; Weissman et al., 2019, 2020).

Dimensional methods of measurement have been recommended for transdiagnostic research assessment of psychopathology (Stanton, McDonnell, Hayden, & Watson, 2020). However, a transdiagnostic approach also can provide a framework for the development of a categorical psychiatric diagnosis. Based on research with victimized children and adolescents who otherwise are subject to complex and burdensome diagnostic comorbidity (D'Andrea, Ford, Stolbach, Spinazzola, & van der Kolk, 2012, the goal of the current study was to test the replicability of previous findings (van der Kolk, Ford, & Spinazzola, 2019) that a transdiagnostically derived posttraumatic syndrome, Developmental Trauma Disorder (DTD), can account for psychiatric comorbidity and is associated with the presence of multiple psychiatric disorders independent of the effects of PTSD among children receiving mental health treatment for multiple psychiatric disorders. Although DTD is a categorical diagnosis, it was designed using a transdiagnostic approach in which symptoms representing or paralleling those from a wide range of internalizing and externalizing psychopathology of childhood were consolidated into a single syndrome based on evidence that they share the common feature of being childhood sequelae of exposure to interpersonal traumatic stressors (D'Andrea et al., 2012). The need for a transdiagnostic approach to assessing and treating traumatized children is highlighted by a study that found that when PTSD was diagnosed in childhood, there was a 5–7 times increased risk of developing a depressive, anxiety, or disruptive behaviour disorder within the next six years (Basu et al., 2020). Children who develop such psychiatric comorbidities are at risk in childhood and across the lifespan for suicidality (Vuijk et al., 2019), death from all causes (Sun et al., 2019), somatic illnesses (Agnafors, Norman Kjellstrom, Torgerson, & Rusner, 2019), and substance use disorders (Conway, Swendsen, Husky, He, & Merikangas, 2016). Children who experience traumatic victimization and psychiatric comorbidity (with or without a diagnosis of PTSD) are at risk for re-victimization (Cuevas, Finkelhor, Clifford, Ormrod, & Turner, 2010) and substance use disorders (Carliner et al., 2016; Conway et al., 2016). Moreover, traumatized children with psychiatric comorbidities who as adults develop PTSD (Gekker et al., 2018a), or depression symptoms and negative memory bias (Cancino et al., 2018; Vrijsen et al., 2017), are at risk for additional lifetime psychiatric comorbidity.

The importance of developing trauma-informed transdiagnostic approaches to identifying and treating children who are at highest risk is further underscored by evidence of the economic costs of traumatic victimization and psychiatric comorbidity, including premature mortality and reduced quality of life due to

pain and suffering, as well as the costs of treatment. Adolescents and adults diagnosed with psychiatric comorbidity have an almost threefold excess mortality (Davies et al., 2019). The estimated annual cost of childhood fatal and nonfatal maltreatment in the USA in 2015 was 2.0 USD trillion, and this does not include the quality of life costs in pain and suffering experienced by maltreated children before they reach adulthood (Peterson, Florence, & Klevens, 2018). With the high risk of adult re-victimization experienced by children who are victimized and have mental health problems (Lee, 2015; Papalia et al., 2017; Ports, Ford, & Merrick, 2015; Scrafford, Grein, & Miller-Graff, 2018), the lifetime economic burden may be severe: the estimated annual cost of rape in the USA in 2014 was 3.1 USD trillion (Peterson, DeGue, Florence, & Lokey, 2017) and the cost of intimate partner violence in 2015 was 3.6 USD trillion (Peterson et al., 2018), 50–60% of which was due to medical costs.

Children with complex psychiatric comorbidity including emotional, interpersonal, and behavioural problems often are refractory to psychotherapy and may receive costly and fragmented multiple-component treatments (Comer, Olfson, & Mojtabai, 2010; Grella & Joshi, 2003; Lau & Weisz, 2003; Mojtabai & Olfson, 2010; Mueser & Taub, 2008; Saldana et al., 2014). Poly-pharmacological and/or poly–psychotherapeutic treatment tends to be only partially and temporarily effective with chronic and severe psychiatric disorders (Grella & Joshi, 2003; Holtmann et al., 2011; Jacobs et al., 2008; Jucksch et al., 2011) and may lead to severe adverse reactions (Barbui et al., 2007; Luo, Cappelleri, & Frush, 2007; Schorr, Loonen, Brouwers, & Taxis, 2008). Alternatively, treatment that is based on a thorough but efficient assessment of transdiagnostic symptoms could provide a more integrated and parsimonious approach for traumatically victimized and poly-diagnosed children and adolescents (D'Andrea et al., 2012).

Developmental Trauma Disorder (DTD) therefore was designed as a transdiagnostic trauma-related syndrome distinct from PTSD in terms of its core symptoms, trauma antecedents, and, of particular relevance to the current study, psychiatric comorbidities. DTD was initially validated in a field trial study conducted with a semi-structured interview for DTD (DTD-SI) (van der Kolk et al., 2019). Additionally, the symptoms comprising DTD have been judged to be distinct from those of PTSD and other psychiatric disorders in international surveys of practicing clinicians and by expert clinicians in published commentaries (DePierro et al., 2019; Ford et al., 2013; Metzner et al., 2019; Rahim, 2014; Schmid, Petermann, & Fegert, 2013). DTD was designed to be of particular relevance for children with multiple psychiatric disorders (Feenstra, Busschbach, Verheul, & Hutsebaut, 2011; McGuire et al., 2016).

DTD assesses symptoms in three domains associated with traumatic victimization and adversity in childhood (D'Andrea et al., 2012). The first DTD domain is affective/somatic dysregulation (Criterion B), based on research and theory demonstrating that maladaptive emotion processing and emotion dysregulation are a potential transdiagnositic mechanism linking childhood adversity and psychopathology (Aldao et al., 2016; Beauchaine & Cicchetti, 2019; Conway et al., 2018; Heleniak et al., 2016; McLaughlin et al., 2020; Weissman et al., 2019). Somatic dysregulation also was included in light of evidence that children often express distress indirectly through somatic complaints and somatoform symptoms (Agnafors et al., 2019). The second DTD domain, cognitive/behavioural dysregulation (Criterion C), includes symptoms referencing cognitive/attentional preoccupation with threat (McLaughlin et al., 2020; Weissman et al., 2020) and behavioural disinhibition/dyscontrol associated with impaired executive functions and effortful control (Beauchaine & Cicchetti, 2019; Hankin et al., 2017; Huang-Pollock, Shapiro, Galloway-Long, & Weigard, 2017; Santens, Claes, Dierckx, & Dom, 2020; Snyder, Friedman, & Hankin, 2019; Wade et al., 2020). The third DTD domain, relational/identity dysregulation (Criterion D), includes avoidant and aggressive modes of relational engagement and social information processing (McLaughlin et al., 2020; Schweizer, Snyder, Young, & Hankin, 2020), disorganized attachment working models and rejection sensitivity (Foxhall, Hamilton-Giachritsis, & Button, 2019; Snyder et al., 2019), and extreme self-devaluation and self-ideal discrepancy (Mason et al., 2019; Schweizer et al., 2020).

This study was designed to determine whether prior evidence that DTD and PTSD have distinct patterns of psychiatric comorbidity (Ford, Spinazzola, van der Kolk, & Grasso, 2018) can be replicated. If DTD has psychiatric comorbidities different from or independent of PTSD's comorbidities, DTD might have incremental clinical utility by identifying psychiatrically impaired children who do not meet criteria for PTSD but could benefit from trauma-focused treatment. On the other hand, if DTD has no unique psychiatric comorbidities independent from those associated with PTSD, this would suggest that PTSD is sufficient as a means of identifying traumatized psychiatrically impaired children. That would be consistent with a view that children's complex posttraumatic symptoms are adequately accounted for by PTSD plus psychiatric comorbidities.

1. Method

1.1. Participants and procedure

A convenience sample of 271 children ages 8–18 years old (M = 12.1, SD = 2.9; 47% female) from varied ethnocultural backgrounds (51% White non-Hispanic, 31% Black or biracial, 10% Latino/Hispanic; 5% Asian American or Other) was recruited between October 2014 and November 2016 at 3 northeastern and 3 west coast U.S. sites, including urban, suburban, and rural communities. Parent/guardian consent and child assent were obtained following an Institutional Review Board approved protocol. Interviews were conducted with 152 parent–child dyads conjointly, 113 parents alone, and alone with six youths age 13 years or older. All children were in mental health treatment, primarily at outpatient clinics (N = 226, 84%). One-third (N = 92, 34%) lived with both birth parents, and one-third lived either with step (N = 39, 14%) or foster/adoptive families (N = 51, 19%). Other children lived with other relatives or non-relative families (N = 44, 17%) or in residential treatment centres (N = 45, 17%).

Based on the KSADS-PL (see below), all participants met criteria for at least one probable psychiatric diagnosis other than PTSD (Median = 4): major depression (N = 168; 62%); generalized anxiety disorder (N = 157; 58%); ADHD (N = 144; 53%); oppositional defiant disorder, ODD (N = 135; 50%); separation anxiety disorder (N = 121; 45%); conduct disorder (N = 65; 24%); phobia (N = 64; 24%); bipolar disorder (N = 41; 15%); obsessive compulsive disorder (N = 27; 10%), psychotic disorder (N = 26; 10%), and eating disorder (N = 15; 6%).

Interviewers (N = 25) viewed simulated interviews conducted by expert assessors, then independently rated videotaped interviews until achieving >80% agreement with expert ratings and conducted and rated videotaped role-play interviews with >90% agreement with an expert's review. Interviewers' first two study interview tapes were reviewed by an expert with >90% agreement required for calibration. Subsequently, a randomly selected 31 interviews with a parent or adult guardian and 15 with a child were independently rated for reliability.

1.1.1. Measures
1.1.1.1. Developmental Trauma Disorder Semi-Structured Interview (DTD-SI). DTD-SI items were designed by a work group from the National Child Traumatic Stress Network, and showed evidence of reliability and criterion, discriminant, and construct validity (Ford et al., 2018) (see Table 1). In the current study, DTD-SI version 10.6 was used, demonstrating good inter-rater agreement for all items (M = 93.0% for child interviews; 93.5% for parent/guardian interviews).

1.1.1.2. Traumatic Experiences Screening Instrument (TESI). This semi-structured interview assesses lifetime history of non-interpersonal trauma (accidents, disaster, illness, loss, separation) and traumatic interpersonal victimization (maltreatment, caregiver impairment, witnessed or directly experienced family or community violence), which are converted to 10 composite trauma types (see Table 2). TESI items have retest reliability over a 2–4 month period (Kappa [K] = .50-.70) and criterion and predictive validity (Daviss, Mooney, et al., 2000, Daviss, Racusin, et al., 2000). Inter-rater agreement for TESI trauma types was M = 97.7% for child interviews and 97.4% for parent/guardian interviews.

1.1.1.3. Kiddie Schedule for Affective Disorders and Schizophrenia, Present/Lifetime Version (KSADS/PL). This semi-structured interview is a validated (Jarbin, Andersson, Rastam, & Ivarsson, 2017)

Table 1. Developmental Trauma Disorder (DTD) criteria.

- Criterion A: lifetime contemporaneous exposure to both types of developmental trauma
  - A1: interpersonal victimization: victim of or witness to physical or sexual assault or abuse, or witness to domestic/adult intimate partner violence;
  - A2: primary caregiver attachment disruption: prolonged separation from or neglect or verbal/emotional abuse by a primary caregiver.
- Criterion B (current emotion or somatic dysregulation, 4 items; 1 required for DTD)
  - B1: Emotion dysregulation (either B1.a. extreme negative affect states; or B1.b. impaired recovery from negative affect states)
  - B2: Somatic dysregulation (either B2.a. aversion to touch; or B2.b. aversion to sounds; or B2.c. somatic distress/illness that cannot be medically explained/resolved)
  - B3: Impaired access to emotion or somatic feelings (either B3.a. absence of emotion; or B3.b. physical anaesthesia that cannot be medically explained/resolved)
  - B4: Impaired Emotion or Somatic Verbal Mediation/Expression (either B4.a. alexithymia; or B4.b. impaired ability to recognize/express somatic feelings/states)
- Criterion C (current attentional or behavioural dysregulation, 5 items; 2 required for DTD)
  - C1: Attention bias towards or away from threat (either C1.a. threat-related rumination; or C1.b. hyper- or hypo-vigilance to actual or potential danger)
  - C 2: Impaired self-protection (either C2.a. extreme risk-taking or recklessness; or, C2.b. intentional provocation of conflict or violence)
  - C 3: Maladaptive self-soothing
  - C4: Non-suicidal self-injury
  - C5: Impaired ability to initiate or sustain goal-directed behaviour
- Criterion D (current relational- or self-dysregulation, 5 items; 2 required for DTD)
  - D1: Self-loathing, including view of self as irreparably damaged and defective
  - D 2: Attachment insecurity and disorganization (either D2.a. parentified over-protection of caregivers; or D2.b. difficulty tolerating reunion following separation from primary caregiver(s))
  - D 3: Betrayal-based relational schemas (either D3.a. expectation of betrayal; or D3.b. oppositional-defiance based on expectation of coercion or exploitation)
  - D4: Reactive verbal or physical aggression (including proactive instrumental aggression that is motivated primarily by preventing/responding to harm/injury)
  - D5: Impaired psychological boundaries (either D.5a. promiscuous enmeshment; or D5.b. craving for reassurance)
  - D6: Impaired interpersonal empathy (either D6.a. lacks empathy for, or intolerant of, others' distress; or D6.b. excessive responsiveness to the distress of others

Table 2. Demographic correlates of DTD, PTSD, and positive screens for probable child psychiatric disorders.

Variable	DTD	PTSD	Depression	Bipolar Disorder	Psychosis	Panic Disorder	SAD
Full Sample	27%	39%	62%	15%	9.5%	10%	44.5%
Age (Pre-teen)	26%	36%	53*%	12%	7.5%	6.5%*	49%
Age (Teen)	29%	43%	73%*	19%	12%	15%*	39%
Gender (Female)	25%	44%	59.5%	20%	11%	12%	44.5%
Gender (Male)	30%	36%	55%	11%	8%	8.5%	45%
Ethnicity (Black, Latino/Hispanic)	24%	40%	57%	16%	13%	11%	47%
Ethnicity (White)	32%	40%	65%	15%	8%	10%	44%
Non-Birth Family	31%	43.5%	64%	18.5%*	11%	11%	47.5%
Birth Family	21%	31.5%	59%	8.5%*	6.5%	8.5%	39%

Variable	Phobia	OCD	Eating Disorder	ADHD	ODD	Conduct Disorder	SI
Full Sample	23.5%	10%	5.5%	54%	50%	24%	26.5%
Age (Pre-teen)	26%	4.5%*	1%	48%	52%	22%	21.5%*
Age (Teen)	21%	16.5%*	11%	59%	48%	26%	33%*
Gender (Female)	24%	10%	6%	44%*	43%*	24%	27%
Gender (Male)	18%	10%	5%	62%*	57%*	210%	25%
Ethnicity (Black, Latino/Hispanic)	21.5%	10%	5%	53%	43%	22.5%	21.5%
Ethnicity (White)	25%	10%	6%	54.5%	55%	24.5%	29%
Non-Birth Family	24%	9%	5.5%	60%*	55%*	28.5%*	27%
Birth Family	23%	12%	5.5%	39%*	40%*	15%*	26%

DTD = Developmental Trauma Disorder; PTSD = Posttraumatic Stress Disorder; SAD = Separation Anxiety Disorder; OCD = Obsessive Compulsive Disorder; SUD = Substance Use Disorder; ADHD = attention deficit hyperactivity disorder; ODD = oppositional defiant disorder; SI = Suicidality. * $p < .05$.

measure of *DSM*-IV child psychiatric disorders, with child and parent versions (Kaufman et al., 1996). The PTSD diagnostic module was used, and internalizing and externalizing disorders were identified as probable vs. absent using KSADS screening questions. Inter-rater agreement for K-SADS PTSD items was 81–100% (M = 85.7% for child interviews, 89.4% for parent/guardian interviews). Inter-rater agreement for probable K-SADS diagnoses was M = 88.8% with child interviewees and 89.6% with parent/guardians. A 3-item internally consistent (α = .79) impairment index was calculated with K-SADS questions dichotomously scoring family, school, and peer functioning as impaired or functional: 95% (N = 258) of the sample were impaired in 1+ domain; 84% (N = 228) were impaired in all domains.

1.2. Statistical analyses

Descriptive statistics were used to characterize the sample and key study variables, followed by bivariate cross-tabulation analyses with odds ratios (OR) and 95% confidence intervals (CI) to examine unadjusted associations age, gender, ethnicity, and family status with DTD, PTSD, and the trauma history variables. Unadjusted ORs and 95% CIs were calculated for DTD and PTSD with K-SADS diagnoses. One-way analysis of variance (ANOVA) compared the number of comorbid diagnoses for children with both PTSD and DTD versus DTD only versus PTSD only versus neither PTSD nor DTD. Multivariate logistic regression analyses were used to test the association of all K-SADS probable diagnoses with DTD and PTSD, controlling for demographics and for PTSD with DTD as the outcome or DTD with PTSD as the outcome.

2. Results

2.1. Descriptive statistics for DTD and K-SADS probable diagnoses

One in three participating children (N = 87, 32%) met DTD symptom criteria, and 39% (N = 107) met criteria for PTSD. One in six children met criteria for PTSD but not for DTD (N = 57, 21%), one in 11 for DTD but not PTSD (N = 24, 9%), and 18% met criteria for both PTSD and DTD (N = 50). Age, gender, ethnicity, and whether the child lived with both birth parents, were unrelated to the likelihood of either DTD or PTSD (see Table 2).

Participants screened positive on average for more than three diagnoses other than PTSD (M = 3.51, SD = 2.44; range = 0–9), including: attention deficit hyperactivity disorder (N = 154, 46%), major depression (N = 168, 62%), oppositional defiant disorder (N = 135, 50%), separation anxiety disorder (N = 95, 35%), conduct disorder (N = 65, 24%), phobia (N = 64, 23.5%), bipolar disorder (N = 41, 15%), panic disorder (N = 27, 10%), OCD (N = 26, 10%), and eating disorder (N = 17, 5.5%). One in four participants were at risk for suicidality (N = 70, 26.5%).

Children with DTD with or without PTSD had more comorbid diagnoses (M = 5.7 and 5.2 [SD = 2.4 and 1.7], respectively) than children with PTSD but not DTD (M = 3.8[SD = 2.1]) or neither PTSD nor DTD (M = 2.1[SD = 1.9]), F[3,267] = 55.49, $p < .001$. Psychiatric diagnosis was largely unrelated to age (pre-teen versus adolescent), gender, and ethnicity (Black/Latinx versus White). Exceptions included (see Supplemental Table): boys and children not living with both birth parents more likely to meet criteria for disruptive behaviour disorders, and teenagers were more likely to meet criteria for depression, panic disorder, OCD, and to be at risk for suicide.

2.2. Relationship of DTD and PTSD with K-SADS probable diagnoses

Children meeting criteria for DTD were approximately three to nine times more likely than others to screen positive for every *DSM-IV* psychiatric disorder assessed except eating disorders, and to be at risk for suicide (see Table 3). Similarly, PTSD was related all disorders except eating disorders and OCD, with somewhat lower odds ratios than for DTD (i.e. approximately two to five times greater likelihood).

2.3. Multivariate relationship of DTD and PTSD to K-SADS diagnoses

In a multivariate logistic regression analysis (see Table 4), after controlling for age, gender, race/ethnicity, and living in an intact family, when *DSM-IV* psychiatric disorders (and DTD) were entered simultaneously into a regression analysis, children with PTSD were more 3.7 times likely than others to meet criteria for separation anxiety disorder ($X^2(16) = 91.25$, Log Likelihood = 260.75, Nagelkerke R^2 = .40). With the same demographic control variables and the *DSM-IV*

Table 3. Unadjusted relationship of DTD and PTSD with probable psychiatric diagnoses.

Comorbid Diagnosis	DTD	PTSD
	OR [95% CI]	
Major Depression	**9.05 [4.03–19.13]**	**4.86 [2.72–8.71]**
Bipolar Disorder	**4.80 [2.39–5.23]**	**4.71 [2.28–9.73]**
Psychosis	**3.28 [1.44–7.48]**	**3.94 [1.65–9.44]**
Panic Disorder	**3.23 [1.45–7.17]**	**2.23 [1.01–4.92]**
Separation Anxiety Disorder	**5.25 [3.01–9.18]**	**5.19 [3.06–8.80]**
Phobia	**3.29 [1.84–5.89]**	**2.19 [1.09–3.37]**
Eating Disorder	1.06 [0.35–3.20]	2.42 [0.84–7.00]
Obsessive Compulsive Disorder	**2.99 [1.33–6.70]**	1.75 [0.79–3.88]
Attention Deficit Hyperactivity Disorder	**5.09 [2.83–9.15]**	**2.63 [1.58–4.37]**
Oppositional Defiant disorder	**9.00 [4.78–16.96]**	**3.00 [1.81–5.00]**
Conduct Disorder	**4.12 [2.30–7.40]**	**2.17 [1.23–382]**
Suicidal Ideation	**4.04 [2.29–7.14]**	**4.36 [2.46–7.72]**

OR = Odds Ratio; CI = Confidence Interval; $p < .05$ indicated in **bold format**.

Table 4. Multivariate logistic regression analyses.

Outcome: PTSD	Beta	S.E.	Wald F	df	p	OR	95%	CI
Age	.088	.060	2.129	1	.145	1.092	.970	1.229
Gender	−.621	.331	3.523	1	.061	.537	.281	1.028
White	−.175	.328	.286	1	.593	.839	.442	1.595
Intact Family	−.291	.342	.727	1	.394	.747	.383	1.460
Depression	.689	.395	3.035	1	.081	1.992	.917	4.323
Bipolar Disorder	.595	.467	1.626	1	.202	1.813	.727	4.525
Psychosis	.597	.562	1.127	1	.288	1.816	.603	5.465
Panic Disorder	−.699	.545	1.649	1	.199	.497	.171	1.445
Separation Anxiety	**1.320**	**.339**	**15.115**	**1**	**.000**	**3.742**	**1.924**	**7.279**
Phobia	−.303	.385	.618	1	.432	.739	.347	1.572
ADHD	.071	.378	.035	1	.852	1.073	.511	2.254
ODD	.293	.394	.553	1	.457	1.340	.620	2.899
Conduct disorder	−.187	.397	.223	1	.637	.829	.381	1.804
OCD	−.261	.537	.237	1	.626	.770	.269	2.205
Eating Disorder	.821	.665	1.524	1	.217	2.273	.617	8.370
DTD	**1.340**	**.379**	**12.470**	**1**	**.000**	**3.818**	**1.815**	**8.033**
Outcome: DTD	**Beta**	**S.E.**	**Wald F**	**df**	**p**	**OR**	**95%**	**CI**
Age	.033	.070	.218	1	.641	1.033	.900	1.186
Gender	.403	.383	1.111	1	.292	1.497	.707	3.168
White	.477	.393	1.472	1	.225	1.612	.745	3.484
Intact Family	−.038	.390	.009	1	.923	.963	.448	2.070
Depression	**1.056**	**.516**	**4.189**	**1**	**.041**	**2.875**	**1.046**	**7.902**
Bipolar Disorder	.343	.495	.481	1	.488	1.410	.534	3.720
Psychosis	−.078	.624	.016	1	.901	.925	.273	3.141
Panic Disorder	.837	.590	2.011	1	.156	2.310	.726	7.346
Separation Anxiety	**.835**	**.395**	**4.477**	**1**	**.034**	**2.305**	**1.063**	**4.997**
Phobia	.674	.411	2.691	1	.101	1.963	.877	4.394
ADHD	.425	.424	1.005	1	.316	1.529	.666	3.509
ODD	**1.245**	**.444**	**7.861**	**1**	**.005**	**3.473**	**1.455**	**8.293**
Conduct disorder	.649	.419	2.403	1	.121	1.914	.842	4.349
OCD	.864	.594	2.111	1	.146	2.371	.740	7.601
Eating Disorder	−.354	.772	.211	1	.646	.702	.155	3.185
PTSD	**1.443**	**.383**	**14.193**	**1**	**.000**	**4.232**	**1.998**	**8.965**

All disorders other than PTSD and DTD are probable diagnoses based on K-SADS screeners. ADHD = Attention Deficit Hyperactivity Disorder; PTSD = posttraumatic stress disorder; DTD = Developmental Trauma Disorder; S.E. = standard error, OR = Odds Ratio; CI = Confidence Interval; $p < .05$ indicated in **bold format**.

psychiatric disorders and PTSD entered simultaneously into a logistic regression (see Table 3), children with DTD were 3.5, 2.9, and 2.3 times more likely than others to meet criteria for ODD, depression, and separation anxiety disorder, respectively ($X^2(16)$ = 128.58, Log Likelihood = 201.62, Nagelkerke R^2 = .54). Thus, DTD and PTSD were independently associated with separation anxiety disorder, but DTD also was independently associated with both affective (depression) and disruptive behaviour (ODD) diagnosis.

3. Discussion

Study findings replicate and extend results from the initial DTD field trial study (van der Kolk et al., 2019) by confirming that: (1) DTD and PTSD often co-occur and share several psychiatric comorbidities, but (2) DTD can occur separately from PTSD and has comorbidities that are not attributable to comorbidity with PTSD. DTD also is more likely than PTSD to occur comorbidly with psychiatric disorders that span the spectrum from internalizing to externalizing diagnoses. These findings indicate that DTD is both distinguishable from PTSD and likely to occur as a comorbidity of multiple psychiatric disorders among children in mental health treatment. The specific findings and their implications for research and clinical practice will be discussed.

Concerning the comorbidities of DTD and PTSD, findings from this study and the first DTD field trial are consistent with prior reports of internalizing and externalizing disorder comorbidity for both PTSD and complex PTSD among adults in mental health treatment (Moller, Augsburger, Elklit, Sogaard, & Simonsen, 2020), young adults (Ho et al., 2020) and adults (Hyland et al., 2020; Shevlin et al., 2018) in community samples, and children in foster care (Haselgruber, Solva, & Lueger-Schuster, 2020b). The DTD field trial results converge with and extend those studies' finding that complex PTSD has more extensive comorbidity than PTSD, showing that DTD had more extensive comorbidity than PTSD with both internalizing and externalizing disorders. Moreover, DTD's comorbidity with specific disorders was independent of the effects of PTSD. The importance of assessing impacts of developmental trauma that extend beyond PTSD is highlighted by the findings of a study with patients in mental health treatment for adult-onset PTSD which found that a history of childhood abuse was associated with both the prevalence and severity of psychiatric comorbidity (Gekker et al., 2018b).

Including DTD as well as PTSD as a potential comorbidity of children's psychiatric disorders thus may enhance both researchers' and clinicians' ability to recognize posttraumatic symptoms when other disorders are present, as well as to account for and address the impact of trauma-related symptoms that can contribute to the onset, chronicity, or severity of the core symptoms of other psychiatric disorders. Comorbidity may be better understood as a byproduct of the heterogeneity of psychiatric disorders that occurs because of the extensive variability of symptom presentations that can qualify for each diagnosis (intra-diagnostic heterogeneity) and the substantial overlap when the same or similar symptoms are included as criteria in multiple diagnoses (inter-diagnostic heterogeneity) (Allsopp, Read, Corcoran, & Kinderman, 2019). This heterogeneity is amplified by the impact that developmental trauma has on the aetiology, symptoms, and course of numerous psychiatric (Allsopp et al., 2019), addictive (Torchalla, Nosen, Rostam, & Allen, 2012), and personality disorders (Jowett, Karatzias, & Albert, 2020).

DTD's extensive comorbidity with childhood psychiatric disorders, therefore, provides a basis for clinicians and researchers to systematically assess trauma-related symptoms that extend beyond PTSD's symptoms, in order to understand how developmental trauma contributes to the core symptoms of those psychiatric disorders and how to adapt treatment to account for those effects. However, what might appear to be comorbidity could be an artefact of the presence of symptoms of DTD (or PTSD) that are shared with other psychiatric disorders or that the other psychiatric disorders share with one another. The likelihood of this occurring in the present study was reduced by using the K-SADS screening items to identify probable diagnoses rather than the full set of often overlapping symptoms for each of the potentially comorbid diagnoses. Each of the potential comorbid diagnoses was assessed based on symptoms that were distinct from those of the other potential comorbidities and those of PTSD (except for depression symptoms, which overlapped with PTSD Criterion D symptoms) and DTD. Therefore, in all likelihood, the comorbidities detected with DTD and PTSD in the current study were not an artefact of symptom overlap with the 'comorbid' disorder(s) and were distinctly related to co-variation between the core symptoms of each psychiatric disorder with those of DTD or PTSD. This line of reasoning raises the possibility of future research examining DTD and PTSD comorbidity using a finer-grained approach, with the symptom criterion sets for PTSD and DTD (i.e. Criteria B, C, and D) used as correlated but distinct entities. It is possible that comorbidity that appears due to the full DTD or PTSD diagnosis may actually be accounted for (or might emerge when previously not detected) when specific symptom subsets within each disorder are considered separately.

More specifically, the findings of the current and previous DTD field trial identify diagnoses for which assessment of DTD may add information beyond that

provided by PTSD. In the internalizing disorder domain, this includes anxiety disorders (separation anxiety disorder [SAD] and panic disorder), unipolar depression, and obsessive compulsive disorder (OCD). SAD and DTD were found to be comorbid in both DTD field trial studies, consistent with the hypothesized etiologic role of disrupted primary attachment bonds in DTD. SAD and panic disorder also are interrelated, (Kossowsky et al., 2013). DTD symptoms representing disorganized attachment reactions, impairments in empathy and psychological boundaries, and maladaptive self-soothing are consistent with separation anxiety reactions that could escalate into panic attacks. SAD and panic symptoms also could be related to the DTD symptoms of threat-related attention bias (Abend et al., 2018) and reactive aggression (Averdijk, Malti, Eisner, & Ribeaud, 2012).

Children meeting criteria for DTD were *nine* times more likely than other children in intensive mental health treatment to meet criteria for depression, almost twice the increased likelihood found for PTSD. Depression is the most consistent and prevalent comorbidity of PTSD (Horesh et al., 2017; Nichter, Norman, Haller, & Pietrzak, 2019), and several depression symptoms are included as symptoms of PTSD (e.g. anhedonia, emotional numbing, irritability). Network analyses have found evidence that depression, PTSD, and complex PTSD symptoms represent distinct subgroups, but that avoidance, worthlessness, and sleep symptoms may be central features linking the separate syndromes (Choi, Batchelder, Ehlinger, Safren, & O'Cleirigh, 2017; Gilbar, 2020; Saxe et al., 2016). The stronger association between a depression diagnosis with DTD than PTSD in the current study, despite the extensive symptom overlap between PTSD and depression, may reflect the strong association between depression and a history of childhood maltreatment (Humphreys et al., 2020; Zhang et al., 2020).

An association between DTD (but not PTSD) with OCD was identified for the first time in the current study. One possible reason for this association is that in the present study OCD occurred primarily (i.e. in 80% of cases) among adolescents rather than younger children. Therefore, the relationship between DTD and OCD may predominantly emerge in adolescence rather than earlier in childhood. Several symptoms of DTD, including emotion dysregulation, threat-related attention bias, impaired self-protection and psychological boundaries, and difficulty in initiating and sustaining goal-directed behaviour, could contribute to the impairments in inhibitory learning and contingency awareness that have been found to be characteristic of adolescents with OCD (McGuire et al., 2016). In addition, although OCD and PTSD may occur comorbidly, the types of trauma history that are most strongly associated with OCD diagnosis and symptom severity are interpersonal and developmental traumas (i.e. violence, sexual and emotional abuse, neglect) (Miller & Brock, 2017). Those traumas also are associated with compulsions but not obsessions, and several DTD symptoms that are distinct from PTSD might involve or contribute to compulsions (e.g. intentional provocation of violence; maladaptive self-soothing; over-protectiveness of caregivers; promiscuous enmeshment or craving for reassurance).

In the externalizing disorder domain, oppositional defiant disorder (ODD) was uniquely associated with DTD in the current study, with an odds ratio that was three times greater than the odds ratio of comorbidity with PTSD. In both field trials, ADHD was uniquely associated with DTD, with an odds ratio in the current study that was two times greater than the odds ratio of being associated with PTSD. In both field trial studies, conduct disorder (CD) also was significantly associated with DTD, with an odds ratio close to twice that for PTSD. ADHD is associated with PTSD, potentially constituting a somatoform sub-type (Fluegge, 2016) or risk factor for the development of PTSD (Biederman et al., 2014). However, ODD has been found to have a stronger relationship with PTSD than ADHD (Ford et al., 2000), as well as to be associated specifically with developmental trauma in children who are in mental health treatment (Ford et al., 1999). CD often co-occurs with ADHD and/or ODD, and adolescent onset CD also has been found to be associated with PTSD (Connor, Ford, Albert, & Doerfler, 2007). Moreover, developmental trauma in the form of interpersonal trauma involving significant interpersonal proximity has been found to be uniquely associated with ODD and CD (Price, Higa-mcmillan, Kim, & Frueh, 2013). Thus, DTD, which includes symptoms related to externalizing disorders (e.g. reactive aggression, impairment in goal directed behaviour) may provide a basis for assessing and better understanding the posttraumatic adaptations that contribute to otherwise often intractable externalizing disorders.

The extensive set of comorbidities associated with DTD suggest that DTD cannot be written off as a epiphenomenon of any single psychiatric disorder or set of disorders (Schmid et al., 2013). Instead, it appears that DTD may identify subgroup of children who present with a complex mix of internalizing and externalizing problems and whose trauma-related symptoms would likely be overlooked if only PTSD symptoms were assessed. DTD thus potentially could enable clinicians to identify children and adolescents who could benefit from complex trauma-focused treatment interventions who would be overlooked if only PTSD was considered as a basis for recommending that treatment. When a child experiences multiple psychiatric disorders and does not respond positively

to evidence-based treatment for those disorders, overlooking the impact of untreated traumatic stress symptoms could add to the emotional, economic and social costs borne by both the child and society, as well as adversely impacting the child's health and quality of life. Given the extreme costs to individuals and society of developmental trauma, research is warranted to test whether identifying and treating DTD can enhance the psychosocial outcomes and reduce the costs of treatment for DTD's comorbid psychiatric disorders. Therapies designed specifically for children experiencing DTD symptoms have been developed (Ford, Blaustein, Habib, & Kagan, 2013), have shown evidence of effectiveness in open and randomized clinical trials, (Ford, 2020), and are disseminated by the National Child Traumatic Stress Network.

The movement in the mental health (and many collaborating) fields to adopt trauma-informed approaches to assessment and treatment has emphasized the importance of not overlooking the potential impacts of traumatization beyond the symptoms of PTSD.(Baker et al., 2018; Bloomfield et al., 2020; Stenman et al., 2019). However, in the absence of a framework and validated measures to assess posttraumatic sequelae other than PTSD symptoms, clinicians and researchers have had no systematic way to identify the children who could benefit from trauma-focused services but who do not meet criteria for PTSD. The symptom complexity and burden introduced by extensive psychiatric comorbidity further complicates the challenge, often obscuring posttraumatic symptoms that do not fit the PTSD criteria but that transdiagnostic researchers and theorists have identified as crucial treatment targets due to serving as a link between childhood adversity and psychopathology (McLaughlin et al., 2020; Schweizer et al., 2020; Weissman et al., 2020). DTD provides an efficient yet systematic clinical framework and a validated measure (Stanton et al., 2020) to guide the provision of evidence-based trauma-focused treatment (Ford, Blaustein, Habib, & Kagan, 2013) or children and adolescents with complex developmental trauma histories and psychiatric comorbidities. This does not supplant evidence-based treatment for any psychiatric disorder but offers the option of integrating trauma-focused treatment into a multi-syndrome and multidisciplinary treatment plan (Schmid et al., 2013).

In light of the heterogeneity of response to evidence-based therapies for childhood PTSD (Gutermann et al., 2016; Uppendahl, Alozkan-Sever, Cuijpers, De Vries, & Sijbrandij, 2019) and other child and adolescent internalizing and externalizing disorders (Hartnett, Carr, Hamilton, & O'Reilly, 2017; Riise, Wergeland, Njardvik, & Ost, 2020; van der Pol et al., 2017; Wergeland, Riise, & Ost, 2020), research

also is needed to determine whether DTD may serve as a predictor or moderator of treatment retention and outcome for those interventions. Findings from research on outcomes of treatment, and predictors or moderators, for childhood psychiatric disorders show mixed evidence that might be clarified by the inclusion of DTD as a predictor. On the one hand, anxiety symptoms and disorders, which were comorbid with both PTSD and DTD in the current study, have been found to be predictive of *better* outcomes for both psychotherapy and pharmacotherapy with depressed adolescents (Meyer & Curry, 2020). However, abuse history moderated the effect of psychotherapy with depressed adolescents, such that a history of sexual abuse – which was associated with neither PTSD nor DTD in a prior study (Spinazzola et al., 2018) – was correlated with *poorer* depression outcomes with psychotherapy than with pharmacotherapy (Meyer & Curry, 2020). In the current study, DTD was associated with a probable depression diagnosis but PTSD was not. Therefore, the potential role that DTD may play in adolescents' response to psychotherapy and pharmacotherapy for depression, as distinct from the effects of other symptoms (e.g. anxiety) and trauma history (e.g. sexual abuse), warrants investigation. Adaptations of treatment for adolescent depression to address symptoms of DTD that covary with but differ from those of depression also warrant investigation.

Parental impairment due to mental health problems, which is associated with both PTSD and DTD (Spinazzola, van der Kolk, & Ford, 2018), is a consistent predictor of poorer outcomes in treatment for childhood anxiety disorders (Norris & Kendall, 2020) and obsessive-compulsive disorder (Kemp, Barker, Benito, Herren, & Freeman, 2020). Adolescents with co-occurring addictive and disruptive behaviour disorders have poorer outcomes in substance abuse treatment unless the treatment is intensive and involves parents as well as their youth (Bachrach & Chung, 2020). Thus, DTD could provide a basis for addressing the complex treatment-refractory combination of internalizing and externalizing symptoms that are associated with the developmental trauma history and comorbidity – in contrast to anxiety or depressive symptoms associated with PTSD that are more amenable to evidence-based therapy. Research is needed to determine whether treatment specifically designed for DTD (Ford, Blaustein et al., 2013) can enhance (or achieve better outcomes than) evidence-based therapies for childhood disorders that are comorbid with DTD and often occur in complex combinations. Currently, no such research exists, with the evidence limited to studies with adults who have symptoms related to *ICD*-11 Complex PTSD (Karatzias et al., 2019; Mahoney, Karatzias, & Hutton, 2019).

3.1. Limitations

Study limitations should be considered when interpreting its results. The convenience sample is not representative of community populations of children, with an over-representation of children with extensive trauma histories in mental health treatment. Therefore, comorbidity profiles documented here cannot be assumed to apply to other populations, and research is needed with samples that are representative of a range of clinical and community populations in order to determine more definitively the comorbidities of DTD. The Disturbances of Self Organization (DSO) symptoms of affect, self, and relational dysregulation in *ICD*-11 complex PTSD (CPTSD) represent a potential alternative or complement to DTD that were not assessed in the current study. Research testing the International Trauma Questionnaire (ITQ) with school-age children and adolescents support the structural validity of DSO/CPTSD (Haselgruber, Solva, & Lueger-Schuster, 2020a; Haselgruber et al., 2020b; Kazlauskas et al., 2020), and indicate that DSO and PTSD may be discriminable by their relationships with anxiety versus depression and dissociation, respectively (Haselgruber et al., 2020a). Comorbidity of DSO with other psychiatric disorders has not been investigated to date. Therefore, research with children and adolescents comparing the psychiatric comorbidities of PTSD, DSO, and DTD, using the DTD-SI and ITQ, could provide a further test of the validity and clinical utility of DTD.

In the current study, although psychiatric diagnoses were assessed with a well-validated and widely used semi-structured interview, only PTSD was definitively assessed, and positive screen findings were used for all other psychiatric diagnoses. The more recent *DSM*-5 and *ICD*-11 diagnostic criteria were not used and should be included in future studies. Also, the resultant estimates of diagnostic occurrence and comorbidity were likely to have good sensitivity but may have been inflated (i.e. reduced specificity) due to instances in which children were positive for a probable diagnosis despite not meeting full diagnostic criteria. The K-SADS screening items were found to correctly identify more than 85% of childhood cases of depression (Lauth et al., 2010) and ADHD (Rucklidge, 2008), but as many as one in four positive screens did not meet full diagnostic criteria. Replication of the current findings with full diagnostic ascertainment of comorbidities is an important future direction. *DSM-5* dysregulation disorder assessment required assessors to apply the criteria without the benefit of a semi-structured interview protocol, although they were assessed using the exact *DSM-5* diagnostic criteria.

Additionally, the traumatic victimization variable was assessed by retrospective self-report in a cross-sectional design without the prospective longitudinal data necessary to establish the timing and sequence of symptoms/ impairment and victimization (Schmid et al., 2013) or external corroboration – although a widely used and well-validated trauma history interview was utilized. Replication is thus needed with similar and different populations, trauma histories that are externally corroborated, and validated diagnoses including complex PTSD.

3.2. Conclusion

DTD warrants further research and clinical application as a developmentally sensitive diagnosis for traumatically victimized children and adolescents who have experienced disruption in attachment bonds with primary caregivers. Many of these children and youth are poly-diagnosed, paralleling the dilemma faced by adults with complex trauma histories and symptoms whom clinicians will be able to diagnose with CPTSD and disturbances in self-organization using the *ICD*-11. DTD's unique comorbidities provide a basis for trauma-informed treatment for children diagnosed with externalizing and internalizing disorders regardless of whether they meet criteria for PTSD. DTD thus offers an integrative clinical framework for assessing and treating poly-traumatized children based on enhancing cognitive, behavioural, relational, and arousal/affective self-regulation. The forms of dysregulation identified by DTD are risk factors for multiple child psychiatric diagnoses. Therefore, based on the replicated findings in the two DTD field trial studies, DTD warrants clinical application and testing because, as concluded by Appleyard and colleagues (p. 235), in 'comprehensive prevention and early intervention efforts with high-risk children, . . . every risk factor we can reduce matters' (Appleyard, Egeland, van Dulmen, & Sroufe, 2005). That dictum was cited in the first DTD field trial report (van der Kolk et al., 2019) and is even more apt in light of the replicated findings in the current study.

Data availability statement

The data is available in a repository on this link: https:// www.complextrauma.org/resources/other-resources/.

Disclosure statement

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