

Links Between Child and Adolescent Trauma Exposure and Service Use Histories in a National Clinic-Referred Sample

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The National Child Traumatic Stress Network (NCTSN) is a federally funded child mental health service initiative designed to raise the standard of care and increase access to evidence-based services for traumatized children and their families across the United States. As part of the quality improvement goal, a Core Data Set (CDS) was established to standardize data collection and examine treatment outcomes across participating centers. This paper describes baseline demographic characteristics, prevalence of trauma exposure, and service use for children and adolescents served by a broad range of NCTSN service delivery centers. Data were collected from children 0–18 years (52% girls, 82% were 6–18 years old) who reported exposure to at least one trauma and who received trauma-related services ($n = 11,104$). Approximately half the sample was White; more than three quarters reported exposure to multiple types of trauma. Sixty-three percent were eligible for state- or federally funded insurance. The two most commonly reported traumatic events were traumatic loss/separation/bereavement and domestic violence. Number and type of trauma exposure varied by gender and age. Type and number of services utilized prior to entering an NCTSN center varied by number of trauma exposures. Systematically assessing children's trauma exposure provides clinically useful information, particularly for those exposed to multiple types of traumatic events. Identifying subgroups, and markers of risk for trauma-related sequelae, may inform policies, programs, and best practices to meet specific needs of children and families. Future research may clarify high-risk trauma profiles for coordinated utilization of systems of care.

Keywords: Child Traumatic Stress (CTS), traumatic events, service utilization, child-serving systems of care, National Child Traumatic Stress Network (NCTSN)

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Mounting evidence indicates that exposure—and in many cases, repeated exposure—to potentially traumatic events is a commonplace occurrence in childhood and adolescence nationwide (Fairbank, 2008). Traumatic events may include, but are not limited to, child physical and sexual abuse, violence in families and communities, natural disasters and terrorism, accidental or violent death of a loved one, refugee and war experiences, impaired caregiving, and life-threatening injury and illness. Epidemiological and community studies have estimated that between 25% to 61% of children and adolescents have histories of exposure to at least one potential trauma (Copeland, Keeler, Angold, & Costello, 2007; Costello & Angold, 2000; Finkelhor, Turner, Ormrod, & Hamby, 2009; McCloskey & Walker, 2000). Studies have also estimated high prevalence rates of exposure for specific types of trauma among subgroups of U.S. youth, with nearly a third experiencing repeated exposure or multiple types of events over their lifetime (Finkelhor, Turner et al., 2009; Copeland et al., 2007). For example, the National Survey of Adolescents estimates for exposure to physical assault and witnessing violence are 22% and 39% among 12 to 17 year-olds, respectively (Kilpatrick et al., 2000). Additional studies suggest that these rates of trauma exposure may be higher among urban, minority youth (Abram et al., 2004; Foster, Kuperminc, & Price, 2004).

These high prevalence rates are especially sobering in light of compelling evidence that trauma exposure can result in significant disruptions in child and adolescent functioning and development (Clark, Thatcher, & Martin, 2010; Ford, Elhai, Connor, & Frueh, 2010; Pynoos, Steinberg, & Piacentini, 1999). Exposure to traumatic events can alter psychobiological development and increase the risk of low academic performance, engagement in high-risk behaviors, difficulties in peer and family relationships, and long-term physical health problems (Carrion, Haas, Garrett, Song, & Reiss, 2010; Clark et al., 2010; Ethier, Lemelin, & Lacharite, 2004; Irish, Kobayashi, & Delahanty, 2010; Pynoos et al., 2009). Moreover, a growing number of studies are incorporating design features that discriminate between children and adolescents who have experienced multiple trauma exposures (i.e., four or more victimization types within the past year) compared to youth who have been both victims of a single trauma and nonvictims (Finkelhor, Turner et al., 2009). Justification for making such between-groups distinctions is found in growing evidence that, compared to singly traumatized youth, youth exposed to multiple traumas are at greater risk for subsequent trauma exposure and cumulative impairment (e.g., psychiatric and addictive disorders; chronic medical illness; legal, vocational, and family problems; Cook et al., 2005; Heim, Shugart, Craighead, & Nemeroff, 2010).

The study of youth exposed to multiple traumas is directly relevant to the study of child service system utilization rates in light of findings that trauma exposure in childhood or adolescence is associated with increased utilization of services across multiple systems. These systems consist of health services, mental health services (including substance abuse treatment), child welfare, and juvenile justice (Abram et al., 2004; Felitti et al., 1998; Hawk, Ford, Kaminer, & Burke, 2009; Jaycox, Ebener, Damesk, & Becker, 2004; Keller, Salazar, & Courtney, 2010; Kisiel, Fehrenbach, Small, & Lyons, 2009; Ko et al., 2008). Findings from these studies provide compelling preliminary evidence of the high prevalence of trauma exposure among children in specific child-serving systems.

Differences in the epidemiology of trauma exposure have also been observed across demographic groups. In studies of adults, gender, race, and age have been identified as risk markers for trauma exposure. Lifetime exposure has been found to be higher among Whites and men than among Blacks and women; past-year exposure has been found to be highest among younger adults (Norris, 1992). Among adolescents, demographic risk markers for trauma exposure include low parental socioeconomic status (SES; Cox, Kotch, & Everson, 2003), being male (for exposure to physical assault and witnessing violence in the community), and being female (for experiencing sexual victimization; Foster et al., 2004; Hanson et al., 2008). Many of these demographic characteristics are also identified as risk markers for the development of post-traumatic stress disorder (PTSD). Being female, a member of a minority group, younger, of low SES, and lacking education are potent markers of risk for PTSD among adults (Brewin, Andrews, & Valentine, 2000). Among adolescents, being female is a risk marker for the development of PTSD (Hanson et al., 2008; Hunt, Martens, & Belcher, 2011). Identifying such risk markers and exploring their implications for service use is an important step in preparing to assess and treat the diverse needs of youth across the U.S. exposed to various types of traumatic events.

The National Child Traumatic Stress Network (NCTSN)

In 2000, Congress authorized the Donald J. Cohen National Child Traumatic Stress Initiative under the Children's Health Act (Public Law 106–310). This initiative is administered by the Center for Mental Health Services (CMHS) of the Substance Abuse and Mental Health Services Administration (SAMHSA) in recognition of the extensive and often unmet needs of children and families exposed to trauma. The National Child Traumatic Stress Network (NCTSN) and its coordinating center, the UCLA-Duke University National Center for Child Traumatic Stress (NCCTS), were established to collaboratively meet the needs of traumatized children, their families, and their communities. The appointed mission of the NCTSN is to raise the standard of care and improve access to services for traumatized children and families throughout the United States. The need for a national resource for these services was underscored by the September 11, 2001 terrorist attacks on the United States, which took place only months after the Network's inception.

The NCTSN is an interdisciplinary network comprised of community-, university-, and hospital-based practice and research centers. The configuration of the Network is intended to facilitate close collaboration among its diverse constituent sites, thereby interlinking centers involved in the scientific development of new interventions with community-based mental health centers, other child-serving systems, and families. In meeting its mission, the NCTSN addresses a broad range of trauma types and serves all age groups, ranging from early childhood to early adulthood (0 to 21 years). As part of raising the standard of care nationwide, a primary objective of the NCTSN is to document the frequency, distribution, and pattern of trauma exposure among children receiving mental health and other services (Pynoos et al., 2008).

Accordingly, we conducted descriptive analyses of Core Data Set (CDS) variables gathered at baseline (i.e., start of treatment) from a large clinic-referred national sample of traumatized chil-

dren and adolescents who received services from NCTSN centers. A primary goal of our study design was to take a “snapshot” view of child and adolescent trauma as it manifests in diverse community-based settings located across the U.S. An additional goal was to delineate the types and range of trauma exposure and service utilization histories across a broad range of child-serving systems of care. Our study questions included:

- (1) What are the sociodemographic characteristics of children and adolescents who are referred to NCTSN centers for trauma-focused services?
- (2) What types of traumatic events do these children and adolescents report at entry into NCTSN programs?
- (3) What types of services have been recently used by these children and adolescents entering treatment for traumatic stress exposure at an NCTSN center?
- (4) What variables (including demographic characteristics and number of types of trauma exposures) best identify those children and adolescents who have a history of recent involvement in multiple child service systems?

Method

NCTSN Centers

The NCTSN is comprised of centers located throughout the United States that provide trauma-informed mental health services, including evidence-based treatment, to children in diverse settings. Data for this paper were provided by 56 SAMHSA-funded NCTSN community-based treatment services (89%) and treatment development (11%) centers. The centers are located across diverse regions of the United States; coming from urban, rural, and frontier areas, large and small states, the four Census Regions (e.g., Northeast), and the nine Census Divisions (e.g., Middle Atlantic). The centers work directly (e.g., provide assessment/treatment services) with the systems—health care, juvenile justice, law enforcement, child welfare/foster care, education, and mental health—that have the greatest impact on the lives of children.

Core Data Set

Following its inception, the NCCTS developed a quality improvement initiative to collect data useful for trauma assessment and treatment across participating NCTSN centers (Pynoos et al., 2008). This initiative, termed the Core Data Set (CDS), was the first of its kind to establish a web-based data collection tool (*InForm*) for collecting standardized client data (e.g., demographics, trauma histories, service utilization, treatment types, impairments in functioning, comorbid conditions, and standardized psychosocial measures) from trauma-exposed children, their caregivers, and other collateral sources. Data extracted from the CDS for this article were collected over a 6-year period, from spring 2004 to fall 2010, and included baseline (i.e., treatment entry) information, demographic and service utilization data, and trauma exposure/history. Data were analyzed using SPSS 18.0. A variety of descriptive and inferential statistics were used in the

analyses, including frequencies, chi-square tests, independent samples *t* tests, and logistic regression.

Participants

The full CDS includes data on 14,088 children and adolescents between the ages of birth to 21 years. For the purposes of this study, we selected for the final analysis sample ($n = 11,104$) all children who had (1) both baseline and trauma history data ($n = 12,462$), (2) a report of having experienced at least one trauma exposure ($n = 11,139$), and (3) were between birth and 18 years of age. Missing data were handled with listwise deletion. Our final analysis sample ($n = 11,104$) represents 78.8% of the full CDS, having deleted 2,984 cases based on the criteria above. All aspects of this quality improvement initiative complied with the Institutional Review Board of Duke University Health System and all federal regulations for human subject protection.

Measures

Information was obtained from multiple sources, including children, caregivers, and collaterals for all measures used in this study.

Demographic variables. Demographic variables included gender, age group, race (White, African American, Indian, Asian, Hawaiian, Unknown), ethnicity (Hispanic and non-Hispanic), current legal guardians (parents, state, other adult relative(s), emancipated, other, unknown), and eligibility for public insurance (which served as a proxy for socioeconomic status).

Service utilization. Service utilization variables included a variety of child services and systems. These variables reflect services that were received by the children and adolescents 30 days prior to treatment entry at an NCTSN clinic. Six service utilization composite variables were computed from the individual service variables. These variables included: (1) School-Based Services: working with a school counselor; attending special classes or school; (2) Juvenile Justice Services: probation/court counselor; detention center/jail/prison; (3) Mental Health Services: outpatient therapy; outpatient psychiatry; case management; therapeutic recreation; (4) Intensive Mental Health Services: residential treatment center; group home; day treatment; inpatient psychiatric unit; (5) Child Welfare Services: foster care; treatment foster care; Child Welfare or department of social services; and (6) Health Services: hospital/ER, primary care physician/pediatrician. All service utilization variables were coded dichotomously (no/yes). We also calculated a service utilization composite score by summing the individual composite variables (Range: 0 to 6).

Trauma history. Trauma history variables in the CDS include 20 different types of trauma exposure derived from the Trauma History Profile (THP) section of the UCLA PTSD Reaction Index (Pynoos & Steinberg, 2006). The THP is completed by the interviewing clinician and includes reports from both the child and his or her caregiver. These include: (1) Traumatic loss/separation/bereavement: death or separation of a primary caregiver or sibling; the unexpected, premature death of a close relative or close friend; separation due to parental incarceration, parental hospitalization, or foster care placement; (2) Domestic violence: exposure to physical, sexual, and/or emotional abuse directed at adult caregiver(s) in the home; (3) Impaired caregiver: history of exposure to caretaker depression/mental health problems, other

medical illness, or alcohol/drug abuse; (4) Emotional abuse: emotional abuse, verbal abuse, excessive demands, emotional neglect; (5) Neglect: physical, medical, or educational neglect; (6) Physical abuse: actual or attempted infliction of physical pain or bodily injury by a caregiver; (7) Sexual abuse: actual or attempted sexual molestation, exploitation, or coercion by a caregiver; (8) Community violence: gang-related violence, neighborhood violence; (9) Sexual assault/rape: actual or attempted sexual molestation, exploitation, or coercion not by a caregiver and not recorded as sexual abuse; (10) School violence: school shooting, bullying, classmate suicide; (11) Serious injury/accident: unintentional accident or injury; (12) Physical assault: actual or attempted infliction of physical pain or bodily injury not by a caregiver and recorded as physical abuse; (13) Illness/Medical trauma: life-threatening or extremely painful illness or medical procedure; (14) Extreme interpersonal violence: homicide, suicide; (15) Natural disaster: major accident or disaster that is the result of a natural event; (16) Kidnapping: unlawful seizure or detention against the child's will; (17) Forced displacement: forced relocation due to political reasons; (18) War/Terrorism/Political violence inside U.S.: exposure to acts of war/terrorism/political violence on U.S. soil, includes actions of individuals acting in isolation (e.g., sniper attacks, OK bombing); (19) War/Terrorism/Political violence outside U.S.: exposure to acts of war/terrorism/political violence, including living in a region affected by bombing, shooting, or looting; accidents that are a result of terrorist activity outside the U.S.; (20) Other trauma: not reported elsewhere. Based on preliminary analyses, we chose to aggregate both confirmed and suspected trauma into one category (coded 1), thereby creating a dichotomous dummy variable (no exposure = 0; at least 1 suspected or confirmed exposure within that category = 1). We also created a new summative variable (Total Number of Trauma Types) for each case by summing the dummy variables for each of the different types of trauma exposures (possible range = 1 to 20). Given the exploratory nature of this study, we then partitioned this Total Trauma Type variable into categories (1–2, 3–4, or 5 + total types of trauma) to facilitate contrasts relating to general dose–response effects for multiple trauma exposures.

Results

Question 1: Sociodemographic Characteristics of Clinic-Referred Children and Adolescents

Of the 11,104 cases, 52% were female. The mean age was 10.6 years ($SD = 4.3$ years, range = 0 to 18 years). Across identified age groups, 17% of the children were between 0 and 5 years, 41% were between 6 and 11 years, and 41% were between 12 and 18 years. Approximately half of the children and adolescents were White/Caucasian (54%) and 28% were African American. Thirty-two percent of the children and adolescents were identified as Hispanic or Latino. With respect to legal guardianship, parents were the most common category (68%). Sixty-three percent of the children and adolescents were eligible for public insurance, including state- or federally funded insurance (e.g., Medicaid) (see Table 1).

Table 1
Participant Characteristics ($N = 11,104$)

Variable	M (SD)/%
Age (in years)	10.6 (4.3)
Age group	16.8
0 to 5 years	
6 to 11 years	41.6
12 to 18 years	41.6
Gender	
Male	47.6
Female	52.4
Race	
White/Caucasian	53.5
Black/African American	27.8
Multiracial	4.9
American Indian	1.9
Asian	0.9
Hawaiian	0.2
Ethnicity	
Hispanic	32.1
Child insurance—Public	62.9
Child's legal guardian	
Parent	68.0
State	15.0
Other adult relative	9.9
Emancipated/Other/Unknown	7.0
Number of trauma exposures	3.6 (2.4)
Number of services used 30 days prior to entering treatment	2.3 (2.3)

Question 2: Prevalence of Different Types of Trauma Exposure as a Function of Gender and Age

Frequencies of specific trauma types. To address Study Question 2, we first calculated the frequencies for the 20 trauma types assessed with the Trauma History Profile (see Table 2).

Number of types of trauma exposure. Seventy-seven percent of the sample reported experiencing more than one type of trauma exposure, with 27% experiencing three to four types of trauma exposure, and 31% experiencing five or more types. The observed total number of reported trauma types ranged from 1 to 20 ($M = 3.62$ total types of trauma, $SD = 2.43$).

Distribution of number of trauma types by gender. We examined the potential link between gender and trauma exposure by examining the total number of types of trauma exposure reported for boys versus girls. An independent samples t test revealed a small but statistically significant between-groups difference, in that girls reported a slightly higher mean number of total trauma types ($M = 3.76$, $SD = 2.52$, Range = 1–15) than boys ($M = 3.46$, $SD = 2.31$, Range = 1–20), $t(11,101) = -6.35$, $p < .001$.

Distribution of specific trauma types by gender. We then examined potential links between gender and specific types of trauma exposure in clinic-referred children and adolescents (see Table 2). Because these analyses involved conducting a series of independent chi-square analyses for each of the 20 trauma types, we used a “familywise” Bonferroni correction. We divided the original .05 p value by 20 and used this new value ($p = .003$) to assess the significance level of each test. These Bonferroni-corrected analyses revealed that significantly more girls than boys reported exposures to traumatic loss/separation/bereavement, sexual abuse, and sexual assault.

Distribution of number of trauma types by age group. We then examined a potential link between age and trauma exposure

Table 2
Frequency of Trauma Types Overall and by Gender and Age (N = 11,104)

Variable	Total sample	Girls	Boys	χ^2	0 to 5 years	6 to 11 years	12 to 18 years	χ^2
	%	%	%		%	%	%	
Traumatic Loss/Separation/Bereavement	49.4	50.7	49.3	11.61*	13.8	40.0	46.2	117.18*
Domestic Violence	49.1	52.2	47.8	.08+	17.7	42.5	39.8	16.25*
Impaired Caregiver	39.8	53.7	46.3	4.97+	18.7	39.2	42.1	24.80*
Emotional Abuse	37.6	53.6	46.4	4.05+	14.9	39.1	46.0	55.17*
Neglect	30.9	52.9	47.1	.50+	22.2	41.3	36.5	116.18*
Physical Abuse	30.6	51.4	48.6	1.63+	15.4	40.0	44.6	19.39*
Sexual Abuse	24.4	70.0	30.0	426.18*	16.6	40.8	42.7	1.67+
Community Violence	15.9	52.4	47.6	.00+	5.6	32.1	62.3	422.00*
Sexual Assault/Rape	15.1	74.0	26.0	383.41*	10.0	30.4	59.6	268.14*
School Violence	11.6	51.9	48.1	.14+	2.3	31.0	66.6	439.24*
Serious Injury/Accident	10.7	48.7	51.3	6.99+	10.9	34.0	55.1	104.3*
Physical Assault	10.2	52.0	48.0	.07+	7.9	26.7	65.4	298.51*
Illness/Medical Trauma	9.6	51.2	48.8	.61+	15.2	36.6	48.2	20.95*
Extreme Interpersonal Violence	5.1	56.3	43.7	3.78+	7.4	26.8	65.8	147.62*
Natural Disaster	5.0	50.2	49.8	1.12+	5.2	38.4	58.5	79.73*
Kidnapping	2.2	61.7	38.3	8.53+	14.6	37.9	47.5	3.56+
Forced Displacement	1.7	59.3	40.7	3.79+	6.7	43.3	50.0	15.50*
War/Terrorism/Political violence outside US	1.1	56.0	44.0	.67+	8.0	30.4	61.6	21.77*
War/Terrorism/Political violence inside US	0.9	67.0	33.0	8.68+	2.0	35.0	63.0	25.31*
Other Trauma	10.7	50.4	49.6	2.09+	16.3	39.7	44.0	3.12+

Note. Trauma exposure categories are not mutually exclusive. Bold values are significant results.

* $p < .003$. ** $p < .000$. +n. s.

by using the Cochran-Mantel-Haenszel test to test the degree of association between age group and number of total trauma types. This test revealed that older children reported experiencing a significantly greater total number of trauma types compared to younger children ($p < .001$).

Distribution of specific trauma types by age group. We next examined potential links between age and specific types of trauma exposure by comparing associations between the different age groups and different trauma types (see Table 2). As with gender, we used a “familywise” Bonferroni correction for the age by trauma type comparisons ($p = .003$) to assess the significance of the chi-square tests. We found differential rates of exposure as a function of age, in that adolescents were significantly more likely to report exposure to 15 of the trauma types examined (e.g., traumatic loss/separation/bereavement, impaired caregiver, emotional abuse, physical abuse), whereas school-age children (6 to 11 years) were significantly more likely to report exposure to domestic violence and neglect.

Question 3: Clinic Referred Children’s and Adolescents’ Recent Service Utilization

To address Study Question 3, we examined the diverse array of ancillary services children and adolescents used in the month prior to entering an NCTSN center for assessment and treatment. Notably, many of the services children and adolescents received in these settings are not necessarily designed to address the youths’ trauma exposures. The total number of services used during the past month ranged from 0 to 19 ($M = 2.29$, $SD = 2.29$).

Recent utilization of specific types of child-serving systems. Recent use of social services (65%) was quite prevalent, as was recent use of general mental health services (48%). The latter

category included outpatient therapy (29%), case management (28%), and treatment from a psychiatrist (13%). Eleven percent received intensive mental health services, including in-home counseling (10%), residential treatment (5%), inpatient treatment (4%), or day treatment (4%). Almost 40% of the children and adolescents received some form of school-based service, including seeing a school counselor, psychologist, or social worker (27%), or attending a special class or school (19%). Twenty-one percent of the children and adolescents received health services, which included treatment from their primary care physician/pediatrician (18%) or treatment at a hospital/ER (6%). Approximately 8% of the sample was involved with the juvenile justice system, which included having a probation officer or court counselor (7%), or detention center, jail, or prison (3%).

Question 4: Predictors of Recent Service Utilization

Distribution of service use by number of trauma types. Pearson’s chi-square test revealed a significant association between number of trauma types experienced and number of services used, $\chi^2(6, n = 8,020) = 978.14, p = .0001$. Our analysis showed evidence of a strong dose-response relation, such that youth with a history of five or more traumatic experiences were more likely to have received four or more services in the preceding 30 days compared to youth with a history of fewer types of traumatic experiences (i.e., one to two trauma types and three to four trauma types).

Prediction of service utilization as a function of number of trauma types. Six separate direct logistic regression analyses were performed on the service utilization outcome variables with number of trauma types (possible range = 1 to 20) experienced as a predictor for each model. Table 3 shows regression coefficients,

Table 3
Direct Logistic Regression Analyses of Service Utilization as a Function of Number of Trauma Types Experienced (N = 11,104)

Variables	b	Odds Ratio	95% Confidence interval for odds ratio	
			Upper	Lower
Juvenile Justice Services	0.14	1.15	1.12	1.19
(Constant)	-3.08			
School Based Services	0.11	1.12	1.10	1.14
(Constant)	-1.02			
Mental Health Services	0.24	1.27	1.25	1.29
(Constant)	-1.02			
Child Welfare Services	0.26	1.29	1.27	1.32
(Constant)	-1.40			
Health Services	0.07	1.08	1.06	1.10
(Constant)	-1.61			
Intensive Mental Health Services	0.24	1.27	1.24	1.30
(Constant)	-3.10			

odds ratios, and 95% confidence intervals for the odds ratios for the number of trauma types experienced for each of the six models. Prior to running the direct logistic regression models with a continuous independent variable (# of trauma types), we first confirmed that there was a linear association between number of trauma types and each of the service utilization outcome variables.

Total Trauma Types emerged as a significant predictor of each of the specific types of services that were modeled (see Table 3). Tests of the full models versus the constant-only models yielded significant effects for Total Trauma Types for juvenile justice services, $\chi^2(1, N = 9,366) = 93.92, p < .001$, school-based services, $\chi^2(1, N = 8,930) = 160.00, p < .001$, mental health services, $\chi^2(1, N = 8,936) = 673.06, p < .001$, child welfare services, $\chi^2(1, N = 9,161) = 802.16, p < .001$, health services, $\chi^2(1, N = 8,928) = 50.90, p < .001$, and intensive mental health services, $\chi^2(1, N = 10,125) = 412.89, p < .001$. Interpretation of the odds ratios revealed that each one-unit increase in the total types of trauma exposure was associated with an increased likelihood of receiving each type of service, namely 15% for juvenile justice services, 12% for school-based services, 27% for mental health services, 29% for child welfare services, 8% for health services, and 27% for intensive health services (see Table 3).

To add further context to the odds ratios linking total trauma types and service utilization, we divided the total number of trauma types for each case by the value 3 (the approximate average total number of trauma types experienced by the sample). Results from the logistic regression models showed that for every three additional trauma types experienced, the sample was 53% more likely to have been involved with the juvenile justice system, 41% more likely to have received school-based services, 204% more likely to have received mental health services, 216% more likely to have received child welfare services, 25% more likely to have received health services, and 206% more likely to have received intensive mental health services.

Discussion

This study utilized a national web-based database of clinic-referred children and adolescents served by NCTSN centers across the United States. Consistent with prior findings that the majority

of children in community samples (e.g., Copeland et al., 2007) are exposed to at least one traumatic event by late adolescence, nearly 80% of children referred for screening and evaluation reported experiencing at least one type of traumatic event, 59% reported experiencing three or more types of traumatic events, and 31% reported experiencing five or more types of traumatic events. Although a higher prevalence of lifetime trauma may be expected in clinic-based samples compared to representative community samples, the frequency and diversity in types of trauma exposures is nevertheless striking and carries direct implications relating to the physical and mental health, development, and treatment of these at-risk youth.

These findings highlight the prevalence and strong links between multiple trauma exposures and polyservice utilization in clinic-referred children and adolescents. In addition, these findings underscore the need for comprehensive trauma history assessment tools and procedures that systematically address the types, number, developmental periods, and density of trauma exposures as an essential part of clinical assessment and treatment planning in such high-risk populations (Layne, Ostrowski, Greeson, Briggs-King, & Olsen, 2010; Ostrowski et al., 2010). In addition, obtaining information about the various systems involved with the child and family will assist in the coordination of care and development of a more comprehensive and integrated treatment model. In this study, children who experienced at least one type of traumatic event were involved with many different kinds of child-serving systems, including social services (65%) and school-based services (36%). Consistent with other studies of health care utilization in trauma-exposed populations (e.g., Smith, Thompson, Johnson, Nitsche, & Kaslow, 2009; Felitti et al., 1998), total trauma types emerged as a significant predictor of all child-serving systems evaluated in this study, including juvenile justice, school, health, mental health, and child welfare. This finding was particularly robust for children involved with the child welfare system and those who experienced multiple types of trauma.

These findings hold direct relevance for shaping service system programs (Ko et al., 2008). They may inform such activities as developing public policy, determining appropriate funding, and

highlighting the need for theory-building research focusing on the complex interplay between trauma exposure, other life adversities, and resilience-promoting processes (Layne et al., 2009). In particular, given the pervasiveness of trauma exposure reported across diverse child service systems (Abram et al., 2004; Ko et al., 2008), these findings underscore the critical need for all child service systems to become trauma informed (Huang, Macbeth, Dodge, & Jaccobstein, 2004; Singer, Anglin, Song, & Lunghofer, 1995) and to communicate and coordinate with each other through shared comprehensive screening and assessment for exposure to traumatic events and potential adverse consequences. This could be done, for example, through a “point of access” system whereby providers in a specific child-serving system, such as primary care, can identify and coordinate referrals for these vulnerable children, adolescents, and families (Smith et al., 2009). Becoming “trauma informed” is defined as ensuring that all staff who are involved in providing services have the knowledge and skills needed to identify traumatized children and families and to support individuals who need access to trauma specialists (Ko et al., 2008). Child-serving systems should recognize the possibility that children may have experienced multiple traumas, and that specific trauma exposure types may exert differential influences on youth’s adjustment, not only in relation to their overall degree of potency, but also by operating through different environmental, psychosocial, and neurobiological pathways (Layne et al., 2010).

These study findings may also inform prevention and early intervention efforts. Adopting routine screening and clinical assessment procedures for gathering a systematic and comprehensive trauma history when children are initially seen for emotional and behavioral concerns—in any setting—is essential for identifying the nature and scope of a child’s trauma exposure. The benefits associated with adopting trauma-informed risk screening and triage procedures are underscored by recent advances in evidence-based interventions and results that show that trauma-related mental health sequelae are highly treatable (Silverman et al., 2008). A comprehensive trauma screening and history fosters the early identification and selection of appropriate evidence-based interventions.

Study limitations include the design of the CDS as a quality improvement initiative that consists of a large national sample of children and adolescents referred to clinics that provide trauma treatment services. The NCTSN sample is thus neither probability-based nor nationally representative, but rather a purposive sample of youth served by NCTSN centers. Accordingly, our results have limited generalizability to the general population of children and adolescents exposed to trauma. Nevertheless, the current findings build upon findings from prior studies by increasing our understanding of the characteristics of clinic-referred children and adolescents across the United States. Another limitation is that we did not review actual administrative case reports to evaluate services used. Rather, data on service utilization were collected exclusively using a self-report form administered to children, caregivers, and other collateral sources as part of a clinical evaluation and assessment session.

An additional limitation is that the study design did not use *DSM-IV* criteria for determining exposure to a traumatic event (i.e., PTSD criterion A) despite its availability in the dataset. Rather, a child’s history of trauma exposure was operationally defined for this study using a simple summation of different types

of potentially traumatic events, and should not be interpreted as total traumatic experiences. Accordingly, a child may have been serially sexually abused five times, but not exposed to any other types of trauma, and nevertheless received a “total trauma type” score of 1. Notwithstanding the potential information lost by this operational definition, the scope of trauma exposures elicited in the CDS is more inclusive than previous reports in the literature and our analyses produced compelling evidence of a dose–response relation between total number of trauma types and services utilization, and underscored the potency of exposure to multiple types of trauma exposure as a marker of risk for use of multiple services and its associated societal costs (Finkelhor, Ormrod et al., 2009).

Strengths of this study include the large number and diverse demographic represented by the study population. Findings point to the need to examine children’s and adolescents’ trauma exposure within a developmentally informed framework that can appreciate its complexity and interrelations with a broad array of child service systems. Our results underscore the need to approach issues related to risk screening, case identification, prevention, intervention, workforce development, and public policy with a clear appreciation for the prevalence, diversity, and density of trauma exposure in youth referred for evaluation and treatment for trauma exposure.

Future research efforts should build on the results of this study by further examining the association of individual characteristics, experiences, and the impact of trauma exposure to create profiles that inform and enhance clinical practice and our understanding of the complex pathways that interconnect various types of trauma exposure and posttraumatic adjustment (Layne et al., 2010). For example, research to determine if “trauma informed” systems of care leads to more frequent and coordinated cross-system interactions and improved quality of care is necessary. In addition, examining patterns of trauma exposure and service utilization by additional demographic characteristics, including race and ethnicity, is of utmost importance to identify those most at risk for disparate access to health/mental health care and other services. Identifying distinct at-risk subgroups, especially youth with histories of extensive trauma exposure histories, may also help inform efforts to design more accessible and coordinated services, interventions, and health care policies. Last, the large size of the NCTSN CDS will enable analyses to unpack specific types of trauma and determine if trauma types are differentially related to specific types of service use and to more or fewer specific psychological and functional problems (Layne et al., 2010). Findings from such analyses may inform policymakers who are responsible for developing and enacting public policies to protect the mental health and safety of children (Fairbank & Gerrity, 2007).

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