

Research Paper

Childhood Trauma and Psychiatric Co-occurrence: A DSM-5 Cross Cutting Measure based Study

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ABSTRACT

Childhood trauma has tremendous adverse effects and increases the risk of full range of psychiatric disorders. Categorical diagnoses can then miss out significant aspects of symptomatology, when diagnostic co-occurrence is a norm rather than an exception. This study examines the psychopathology in children and adolescents exposed to traumatic events using cross cutting measures. Data were collected from 50 children and adolescents, aged 8-16 years, at a tertiary psychiatric hospital in eastern part of India. MINI-KID interview and TESI-C were used to assess presence of significant trauma and psychopathology type. The Cross-Cutting Symptom Measure (based on DSM-5), consisting of 13 psychiatric domains was used. Results reveal that children and adolescents had moderate level of dysfunction with regard to symptomatology of depression, anger, anxiety, somatic, sleep problem and memory/inattention, whether or not they meet the diagnostic criteria. A vast majority had more than 5 cross cutting symptoms in moderate to severe intensity, regardless of the gender. The study highlights the need for comprehensive assessment of children and adolescents exposed to traumatic events. This shall enable clinicians to individualize therapies for better healing of children/adolescents. Implications and directions for future research are discussed.

Keywords: *Childhood trauma, Co-occurrence, Cross cutting measure, DSM-5*

Abuse of a child is a lifelong evil. Childhood trauma is defined by National Institute of Mental Health (NIMH, 2018) as ‘the experience of an event by a child or adolescent that is emotionally painful or distressful, which often results in lasting mental and physical effect’. Sufficient evidence documents that childhood trauma increases the risk of the full range of psychiatric disorders, including mood disorders (Collin et al. 2011; Lieberman et al. 2011), dissociative disorders (Scott, 2020) substance use disorders (Lieberman et al., 2011) and psychosis (Misiak et al., 2017; Ross & Stoppelbein, 2012). The impact of early trauma is additionally profound because it occurs during those critical periods when the brain is most rapidly developing and organizing (Heim et al., 2010). Because the experiences of early life determine the organization and function of the mature brain, going through adverse events in childhood can have a tremendously negative impact on early development, including social and emotional development (Meaney, 2001; Nelson

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& Gabard-Durnam, 2020; Sharma et al., 2022). In fact, Varese et al. (2012) had reported in a study that child abuse is a predictor of future psychotic symptoms or psychotic diagnoses after reporting a substantial connection between child abuse and mental illnesses (odds ratio, 2.95; 95% confidence interval [95% CI], 2.25-3.88). Physical abuse has been significantly linked to psychiatric illness, in an Indian study which involved children ages 4 to 16 years (Srinath et al., 2005). Depressive disorder (up to 35%) and stress-related disorders (25%) including post-traumatic stress disorder (20%), acute stress disorder (5%), and adjustment disorder (17.5%) have been reported as the most frequent diagnoses among children with a history of sexual abuse (Brown et al., 1999; Putnam, 2003; Sowmya, 2016) Some studies point towards more prevalence of psychiatric disorders due to abuse in certain age groups. 12–14 years old who have suffered physical abuse, emotional abuse, and/or neglect, are more susceptible to specific phobia, social phobia, separation anxiety, and motor tics (Pandey et al., 2020).

Such categorical approach has a limitation to tap diverse presentation of psychopathology in children and adolescents exposed to traumatic events. Childhood trauma impacts an individual in varied ways. Hence even if the clinical presentation of symptoms may be similar, the population remains in fact, heterogenous. Categorical diagnoses can then fail or miss out significant aspects of symptomatology, when diagnostic comorbidity and co-occurrence is a norm rather than an exception (Lau & Weisz, 2003).

In a shift away from concrete defined categories, DSM-5 talked about cross cutting measures (Narrow & Kuhl, 2011). This enables clinicians to monitor the child's overall psychiatric symptomatology over time across diagnoses, even in areas that are unrelated to their primary diagnosis. Additionally, this makes it possible to recognise the heterogeneity within diagnoses, which is critical for advancing our knowledge of mental diseases and for future study in understanding childhood trauma. There may be additional clinical value by identifying children who are psychiatrically impaired but do not meet the criteria for trauma related disorders but could benefit from trauma-focused treatment if cross-cutting measures can indicate psychiatric comorbidities distinct from or independent of just one trauma related pathology. The present study aimed to explore psychopathology in children and adolescents exposed to traumatic events who visited the outpatient setting in a tertiary care centre. The novelty of the study is that it used the cross cutting measures, so it provides detailed evidence on individual symptomatology, than can be used to inform future interventions.

METHODS

Participants and sampling

We carried out a cross-sectional descriptive study of 68 children and adolescents aged 8-16 years, in the out-patient and in-patient department of a tertiary psychiatric hospital in eastern part of India, between December 2019 and December 2020. Purposive sampling was used. 18 participants did not complete the assessment. Data from 50 participants was included the study. The selection criteria included having a significant trauma event prior to onset of symptoms after a trauma screening interview. Informed consent and assent were taken from participants and their caretakers (parents/ guardians). Other selection criteria included being between the ages of 8-16 years, no previous physical illness or psychiatric disorder diagnosed prior to exposure to traumatic event(s), no previous history of treatment, and willing to participate in the present study.

Measures

For the present study, a socio-demographic data sheet was created that included socio-demographic and clinical factors (age, gender, education, place of residence, history of physical or psychiatric illness, family history, duration of illness, age of onset, and diagnosis). As screening tools, the Mini-International Neuropsychiatric Interview for Children and Adolescents (*M.I.N.I.- KID.*; Sheehan et al., 2010) and Traumatic Events Screening Inventory for Children (*TESI-C*; Ford et al., 2022) were used to assess presence of significant trauma and psychopathology type. The *TESI-C* has excellent associations with other trauma events screening measures, according to Basharpour et al. (2011). *M.I.N.I.- KID* also has acceptably high validation and reliability scores (Duncan, L., et al., 2018). This scale is administered to rule out any other comorbid psychiatric illness in the participants.

For the aim of the present study, the Cross-Cutting Symptom Measure in *M.I.N.I.- KID* (based on DSM-5) was used. The measure consists of 13 psychiatric domains, including *depression, anger, mania, anxiety, somatic symptoms, suicidal ideation/attempt, psychosis, sleep disturbance, memory/ inattention, repetitive thoughts and behaviours, dissociation, functionality* and *substance use*. Each domain is rated by clinician or parent/guardian in terms of how much (or how frequently) the particular symptom has disturbed their child during the previous two weeks. Cross-Cutting Symptom Measure can be finished in less time, and thanks to its design, it provides a thorough assessment of the functioning across many bio-psychosocial contexts.

Statistical Analysis

The Statistical Package for the Social Sciences (SPSS) version 25 SPSS 25.0v, (IBM, Chicago, IL) was used for statistical analysis. Descriptive statistics were done to compare the socio-demographic and clinical variables across male and female participants. For comparing categorical data, the Chi-square test was used. For comparing continuous data, independent sample t-test was used. The level of significance was considered <0.05 . Descriptive statistics was also used to obtain data on type of traumatic event reported by participant, the distribution of psychiatric disorder across sample and the cross cutting measure domains for each severity rating.

RESULTS

The total study sample constituted of 50 participants, 25 males and 25 females, with mean age of 13.86 (S.D.= ± 2.42) years, having average education of 7 years (7.04 ± 2.55), mostly residing in urban (36%) and semi urban (36%) domicile, with lower (44%) to middle (44%) socio economic status. The participants averagely had history of a year with symptomatology (13.08 ± 7.54 months) with a mean age of onset of illness at 12.80 (S.D. = ± 2.10) years.

Socio-demographic and clinical variables of participants and respective scores with respect to male and female participants are described in Table 1. There was no significant difference between males and females with regard to age, level of education, age of onset of illness and duration of illness symptoms [Table 1]. Female participants were significantly more from urban areas, belonging from middle socio economic class as compared to male participants who were mostly from rural domicile and lower socio economic class.

There was no significant difference between males and female in terms of all kinds of traumatic events. The most reported form of single trauma type was emotional abuse followed by physical abuse [Table 2]. The distribution of psychiatric disorders across the sample, as assessed on *M.I.N.I. - K.I.D.* interview, indicated presence of Dissociative

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Disorder (20%), Major Depressive Disorder (18%), Conduct Disorder (14%), Major Depressive episode (12%) and Social anxiety disorder (12%) majorly, along with Bipolar disorder (6%), Obsessive Compulsive Disorder (2%), Oppositional Defiant Disorder (8%), Panic Disorder (6%) and Substance use disorder (2%).

Table 3 demonstrates psychiatric domains of the cross cutting measure and percentage of participants obtaining respective severity score for each domain. A large number of participants were found to have moderate level of dysfunction with regard to symptoms of *depression, anger, anxiety, somatic, sleep problems* and *memory/inattention*. We also analysed the number of symptom (moderate- severe) reported by participants, as represented in Table 4. Vast majority reported more than five symptoms, irrespective of their gender (78%).

Table 1: Descriptive analysis of socio-demographic and clinical variables (Continuous) across male and female participants (N=50)

Variable	Male (n=25) Mean (S.D.)/ n(%)	Female (n=25) Mean (S.D.)/ n(%)	t/ χ^2	p
Age (in years)	13.92 (2.30)	13.80 (2.57)	.174	.863
Education (in years)	10.88 (2.51)	11.20 (2.65)	.439	.663
Domicile Rural Semi urban Urban	11 (22%) 8 (16%) 6 (12%)	3 (6%) 10 (20%) 12 (24%)	6.79	0.033*
Socio-economic status Lower Middle Upper	17 (34%) 6 (12%) 2 (4%)	5 (10%) 16 (32%) 4 (8%)	11.75	0.003**
Duration of illness (in months)	13.16 (7.62)	13.00 (7.61)	.074	.941
Age of onset (in years)	12.80 (1.98)	12.80 (2.27)	.000	1.00

*P<0.05, **p<0.01

Table 2: Distribution of type of trauma events reported by participants (N=50)

Trauma type		Males (n=25) n (%)	Females (n=25) n (%)	χ^2	p
Physical abuse	Present	8 (32%)	9 (36%)	0.89	.765
	Absent	17 (68%)	16 (64%)		
Sexual abuse	Present	4 (16%)	3 (12%)	0.17	.684
	Absent	21 (84%)	22 (88%)		
Emotional abuse	Present	13 (52%)	19 (76%)	3.12	.077
	Absent	12 (48%)	6 (24%)		
Neglect	Present	8 (32%)	4 (16%)	1.75	.185
	Absent	17 (68%)	21 (84%)		
All type of trauma event	Only one	17 (68%)	14 (56%)	0.76	.382
	More than one	8 (32%)	11 (44%)		

Table 3: Distribution of Cross Cutting Measures in participants (N=50)

Variable	Mild [Score of 0-3] n (%)	Moderate [Score of 4-6] n (%)	Severe- Extreme [Score of 7-10] n (%)	Total
Depression	3 (6%)	38 (76%)	6 (12%)	47
Anger	15 (30%)	27 (54%)	6 (12%)	48
Mania	14 (28%)	3 (6%)	0	17
Anxiety	9 (18%)	33 (66%)	8 (16%)	50
Somatic	12 (24%)	33 (66%)	0	45
Suicide	18 (36%)	7 (14%)	0	25
Psychosis	10 (20%)	0	0	10
Sleep	1 (2%)	43 (86%)	6 (12%)	50
Inattention/ Memory	13 (26%)	31 (62%)	6 (12%)	50
Repetitive thoughts	4 (8%)	0	2 (4%)	6
Dissociation	9 (18%)	9 (18%)	3 (6%)	21
Functionality	4 (8%)	44 (88%)	2 (4%)	50
Substance use	1 (2%)	4 (8%)	0	5

Table 4: Number of symptoms (Moderate- Extreme) noted on Cross cutting measures, among male and female participants.

Number of symptoms	Total (n=50) n (%)	Male (n=25) n (%)	Female (n=25) n (%)	χ^2	<i>p</i>
>5	39 (78%)	19 (76%)	20 (80%)	.834	.107
≤5	11 (22%)	6 (24%)	5 (20%)	.769	.264

DISCUSSION

The present study analysed psychopathology in form of cross cutting measures (based on DSM-5), in children and adolescents exposed to traumatic events, to demonstrate its utility in representing the child’s overall psychiatric symptomatology across diagnoses, even in areas that are unrelated to their primary diagnosis. Findings show *moderate level of dysfunction* with regard to symptomatology of *depression, anger, anxiety, somatic, sleep problem* and *memory/inattention*, whether or not they meet the diagnostic criteria.

The results highlight the need for comprehensive assessment of children and adolescents exposed to traumatic events, as symptomatology(s) significantly co-occur (Antony & Stein, 2009). Childhood trauma impairs social information processing, impulse control, and emotion regulation on a neurobiological level (Chen et al., 2012), thereby raising the risk for persistent and severe co-occurring issues with impulse control, emotion regulation, attention and cognition, dissociation, and functionality, on a wide spectrum, reinforcing the for integrated assessment (Satapathy et al., 2017).

Numerous symptom-level networks exist, according to research, by which various symptoms may reinforce one another (Price et al., 2019). Co-occurrence of somatic symptoms, like chronic pain and headache, has been documented with depressive symptomatology and bipolar disorder (Macedo et al., 2019), de-realization from dissociative disorder and concentration issues from PTSD (Kratzer et al., 2021). These associations

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between functional impairment and pain intensity are mediated by subjective sleep disruptions (Szelenberger & Soldatos, 2005). It can also be explained in the background of traumatic memory consolidation in the hippocampus which has been linked to sleep deprivation, which in turn supports trauma related symptoms (like pain, hyperarousal, anger) or makes it worse (Nardo et al., 2015). Additionally, hyperarousal due to traumatic events modifies the body's stress response through affecting the Hypothalamic-Pituitary-Adrenal (HPA) axis (De Kloet et al., 2006). Somatic symptoms can then be seen as an outcome of the HPA axis dysfunction. Also, co-occurrence of symptoms of depressive disorders, anxiety disorders and somatic disorders (Martucci & Mackey, 2016; Wang et al., 2015) can be attributed to altered connections among brain areas responsible for emotion processing, such as the amygdala, prefrontal cortex, and hippocampus (White et al., 2012). Symptomatic overlapping of sleep disturbances and memory disturbances can be seen in context of appraisal and coping mechanisms which children and adolescents may use during or post-trauma phase.

Anger, can be an indicated form of reaction which the victim has towards the maltreatment situation (Andrews et al., 2000). It can be seen as coping mechanism for survival and counter-attack, against the assaultive situation (Tangney et al., 1992). A little stern warning can appear as the beginning of true danger, to a child or adolescent who has developed physiological adaptations to a high-threat environment due to previous trauma exposure.

There is also considerable research indicating co-occurrence of dissociation as related to observed problems of auditory attention, working memory, cognitive processing speed and self-competence (Cromer et al., 2006; DePrince et al., 2009; Perzow et al., 2013). Children and adolescents exposed to trauma thus, have impaired performance on attention and memory related cognitive tasks, distinguished from those not exposed to trauma, as a symptom of dissociation (Reyes-Perez et al., 2005).

Research on childhood trauma must gradually move away from clinical diagnosis, to more emphasis on cross-cutting indicators that consider the wide influence of trauma exposure on child and adolescent development in dimensional form rather than only categorical. This shift in emphasis is due; in part to the realisation that probabilistic pathways, rather than linear causality, best describe development. This shift in strategy will enable clinicians to personalise or individualise therapies based on the nature and timing of a child's experiences, as well as that child's sensitivity or response to those experiences.

Limitations and Direction for Future Research

The difference between male and female participants in regard to their domicile and socio economic status suggests that one should be cautious while generalizing results from the study and future studies may control these factors. Additionally, the sample size in the study is less, and further studies can replicate it with higher number of participants. The trauma interview was taken during active psychopathology, which may hinder the nature of trauma memories reported.

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Author's contributions

All authors substantially contributed to the design of the work, analysis and interpretation of study data. First author did the data collection. All authors drafted the work and revised it critically for important intellectual content and mutually agreed for publication.

Ethics approval

The study was approved by Institute Ethics Committee of Central Institute of Psychiatry, Ranchi, and the study was performed in accordance with the ethical standards.

Conflict of Interest

The author(s) declared no conflict of interest.

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