Chapter 8
Psychological Trauma, Adolescence, and Post-traumatic Stress Disorder

Sujata Satapathy

Abstract The chapter provides a comprehensive overview of the link between traumatic events, adolescence, and post-traumatic stress disorder among them. It provides an introduction to traumatic life events, why adolescence is a high-risk period for trauma, multidimensional trauma impacts, the factors determining trauma impacts, and key signs of trauma in adolescents. Further, the chapter discusses how traumatic incidents affect the biology of the adolescents, key theories that explain the link between trauma and post-traumatic stress development, and finally covers specific risk and protective factors in post-traumatic stress disorder (PTSD). It talks about diagnosis, assessment, and treatment for PTSD.

Keywords Trauma · Adolescence · Post-traumatic stress · Post-traumatic stress disorder · Psychological assessment · Interventions · Role of parents

Introduction

Originating from Greek language, the word "trauma" means "wound" (Webb, 2004). It is experienced at a biological level even though it starts from a psychological source. Pavlov (1960) described it as a lasting psychological alteration within the brain. According to van der Kolk (2000), trauma occurs when an individual feels helpless and loses the sense of having a safe place to retreat to and process the emotions or experiences.

Psychological trauma generally refers to any incident/experience/exposure that is a threat to an individual's existence, a violation of basic survival rights, an intensely stress producing event that overstrains the individual's existing resources, a sufficiently intense event to defeat defense mechanisms (Brette, 2004), and shatter fundamental assumptions one has about oneself and the world (Janoff-Bulman, 1992). A traumatic stressor is a broad term that encompasses a variety of experiences and situations ranging from an observable threat of death, disease, disability, and disasters

S. Satapathy (✉)
Department of Psychiatry, AII India Institute of Medical Sciences, New Delhi, India

S. Patra (ed.), *Adolescence in India*, https://doi.org/10.1007/978-981-16-9881-1_8

to less observable threats such as abuse, violence in family, and detachment from attached figures.

Psychological trauma is the unique individual experience of an event or enduring conditions in which the individual's ability to integrate his/her emotional experience is overwhelmed and the individual experiences (either objectively or subjectively) a threat to his/her life, bodily integrity, or that of a caregiver or family (Saakvitne, et al., 2000). It is a multidimensional socio-cultural context. Nevertheless, when a particular experience is beyond a normal human experience, it is regarded as traumatic across cultures (Rajkumar et al., 2013).

Trauma is considered *acute* when it is a single episode of traumatic event such as a car accident, major theft, and witnessing a violent event but severe enough to have a significant impact on the child. *Chronic trauma* refers to the experience of same traumatic event occuring repeatedly for a long period of time, e.g., long-term child abuse, ongoing sexual abuse, living in a violent environment, neglect, etc.

The stress arising out of the trauma experienced is called **Post-traumatic stress (PTS)** which is a common and often adaptive response to any stressful situation. Physiological and mental signs and symptoms may include racing heartbeats, shaking hands, sweating, or feeling scared and nervous, tensed muscles, and breathing faster. These are usual "fight-or-flight" responses of General Adaptation Syndrome (GAS) where the body stops non-critical functions like digestion and diverts more blood and oxygen to the muscles to deal with the emergency.

Since this fight-or-flight response is a normal reflex, post-traumatic stress is considered a normal reaction and not a mental disorder. Treatment is not required as the symptoms are likely to subside on their own. However, if adolescents are troubled with the symptoms, there is a risk that they may develop maladaptive coping mechanisms such as drinking alcohol or using drugs. Further, it may lead to **Post-traumatic stress disorder (PTSD)** which is a debilitating, commonly chronic, and diagnostic mental disorder. Repeated and prolonged exposure to trauma in childhood severely exacerbates the symptoms of PTSD—often referred to as complex PTSD (cPTSD) (Cloitre et al., 2009).

PTS and PTSD:

- While PTS symptoms improve or resolve within a month, PTSD symptoms are more severe, persistent, can affect biological and socio-occupational functioning, and can last for more than a month.
- Most people with PTS do not develop PTSD. People can develop PTSD without first having PTS.
- PTS requires no medical intervention, unless symptoms are severe. However, psychological healthcare support can prevent symptoms from worsening.
- PTSD is a medically diagnosed condition and should be treated by clinicians.

Trauma, Biological Foundation, and Adolescence

Adolescents typically are at high risk for experiencing traumatic events. Several factors contribute to this in an interactive way ranging from biological, typical developmental characteristics of adolescents to socio-cultural influences. Since adolescence is a growing stage, all the aspects of development are affected by trauma. Adolescents are more vulnerable to physical, social, emotional, and cyber bullying in and outside the school, peer group violence, sexual abuse during dating, involvement in high-risk behaviours such as substance use, and high-risk sexual behaviour (Norwood et al., 2000). It can result in declining school performance, behavioural and socio-emotional problems and other issues that can affect the daily functioning of the adolescent, their quality of life and future.

Trauma experienced during adolescence is particularly important due to the significant brain (neuro-cognitive) development that occurs at this age (Hales & Yudofsky, 2003). Traumatic events can change major structural components of the central nervous system and the neuroendocrine system (Shaw, 2002) leaving a lasting effect on learning and information processing capability. It affects the cell production in brain and the secretion of hormones. It also might delay the development of the prefrontal cortex leading to heightened domination of amygdala resulting in emotional dysregulation.

"Some Interesting Facts About Adolescent Brain"

"Use it or lose it" cells

Adolescent brain is characterized by a huge increase in cell production, which indicates a rich potential to develop new skills. Lack of proper stimulation and guidance leaves these additional brain cells unused leading to their eventual decay. Though adolescents may learn these skills later on, this can greatly delay the process.

Neural Highway Repairs

There needs to be communication among different parts of the brain to function effectively. Myelin, a coating that speeds up communication on the neural highway between parts of the brain, grows in adolescence. To make this possible, the production of serotonin, a hormone that enhances mood, is slowed down. This explains the mood fluctuation experienced by adolescents frequently.

Prefrontal Cortex and Amygdala (Cognitive Brain and Emotional Brain)

Prefrontal cortex part of the brain controls impulsivity, decision-making, prioritizing, displaying appropriate behavior, empathy, etc. However, as the prefrontal cortex is developing in adolescents, the amygdala—the more emotional part of the brain may dominate which explains adolescents more often interpreting situations through an emotional mind rather than a rational one. This has implications for emotional regulation skills in adolescents.

Brain Development in Adolescence and Role of Trauma

Myelin development in the brain has been found to be important for adolescent learning, cognition, and behavior (Corrigan et al., 2021). Myelination process occurs from caudal to the rostral (i.e., back to front). Thus, prefrontal areas related to reasoning and judgment mature later as compared to the sensory and motor regions of the brain in the back. Further, depending on individual's life experience and the use of brain pathways, only the active neuronal connections are strengthened, whereas other inactive neurons result in cell death. This decrease in gray matter (cell bodies) occurs due to a process of "pruning." This implicates the inability of adolescents to think through the consequences of their behaviours and acting rashly and impulsively.

The body makes a number of profound physiological changes in case of traumatic life experiences. A highlight on the body's nervous system and endocrine system, which are the regulators of the body's physiological stability or homeostasis will be helpful here to understand how a child experiencing trauma processes it.

(a) ***The Nervous System***

The nervous system has three core functional roles in the communication networking of the brain: (a) detect information received by sense organs and internal organs, (b) organize that information, and (c) activate appropriate and adequate responses. The autonomic nervous system (ANS) oversees involuntary bodily functions or responses including our capacity to socially engage, trust, and intimacy. It evaluates events and people for their survival significance and prepares the body for appropriate response/action. While the sympathetic branch initiates actions or mobilizes physiological responses for either fight or flight under stressful circumstances, the parasympathetic nervous system modulates these physiological responses, e.g., heart rate, etc., to conserve energy. When both branches move in a flowing and reciprocal manner, the body's internal state is regulated and the body feels stability and at ease.

Here, let us know about the **Polyvagal theory** to understand the complexity of ANS in its capacity to switch between defensive strategies and a socially engaged sense of safety and connection (Porges, 2001). The phylogenetic emergence of dorsal vagus (which is an older, more primitive, reptilian and vegetative structure and emphasizes on the brainstem's involvement in the defensive strategies of immobilization e.g., fainting or dissociation) and ventral vagus (limbic-based system that modulates sympathetic arousal through social engagement to defuse aggression and tension) as explained by this theory throws light on evolutionary changes in the adaptive nature of the body's physiology. When the body experiences trauma at an early age, the dorsal vagus' defensive strategies of immobilization come to operate leading to freeze, faint, and even dissociation. As a result, the ventral vagus fails to adequately develop, hence, child's social development is impaired and the body automatically favours withdrawal from social engagement to control state of arousal. On a physiological level, the impact of early trauma on the vagus nerve, the 10th cranial nerve of the body which renders to larynx, pharynx, heart, lungs, and gut, leads to a variety of physiological responses thus, impacting myriad psychological,

social, and behavioural symptoms consequent to the traumatic experience (Heller & LaPierre, 2012). As the brain does not have a central processor, through a process called **Reentry** the brain weaves together the information entering into different regions via their respective quale (discrete attributes of the reality and storing that in a specific region. For instance, colour is stored in visual cortex and sound is stored in auditory cortex separately to create a coherent whole of the circumstance.

This crucial function of the brain to integrate and blend the quale—that is the process of reentry, fails when there is early trauma. And this failure of reentry process results in unprocessed sensory information remaining in disconnected fragments or interferes with the brain's capacity to organize information together to produce a coherent narrative. Neural plasticity of the brain can also be affected during the sensitive phase of adolescence.

(b) ***Endocrine System***

The endocrine glands produce a chemical network of signals that keeps the entire body under control by regulating vital metabolic. Growth and maintenance of our body depends largely upon the coordinated functioning of the nervous and endocrine systems—often referred to as neuroendocrine system. If the stress-induced hormonal changes remain chronically high, the body loses its capacity to adapt and recover which leads to adrenal fatigue and exhaustion (Selye, 1956).

Early traumatic stress affects the *Hypothalamic–Pituitary–Adrenal (HPA) axis* that regulates cognitive, immune, and behavioural responses to stress (Lupien et al., 2009). Severe trauma during childhood also contributes to increased HPA axis activity and higher cortisol production. This affects the smooth functioning of the neuroendocrine system that can lead to various disorders including post-traumatic stress disorder. For example, interpersonal trauma affects cortisol regulation and the corresponding decrease in brain volume (Carrion et al., 2010). In the case of severe trauma and resulting PTSD, high levels of cortisol can cause cell damage and even complete shutdown of hippocampus risking memory impairment (Heller & LaPierre, 2012).

The Sympathetic-Adrenal-Medullary System indicates that in the event of chronic traumatic stress, adrenal medulla releases adrenaline (epinephrine) and non-adrenaline (non-epinephrine) hormones leading to key physiological changes in the body, e.g., increased heart rate, increased blood sugar, constriction of blood vessels, pupil dilation, etc.

Since cortical and limbic systems of the brain are inseparably interwoven and the thinking brain is built upon the foundation of the emotional brain, the excessively high levels of emotional arousal can impair memory in case of constant threat. Derailment of normal bio-chemicals can have negative effects on immunity and may cause mental disorders.

Multidimensional Impact of Trauma

Almost all children and adolescents experience some kind of psychological distress or behavioural change, e.g., nightmares, difficulty in sleeping, anxiety, irritability, anger, etc., after trauma exposure (American Psychological Association, 2015). Most children can successfully overcome this and be resilient in the face of adversity. However, some may end up having mental health problems such as post-traumatic stress disorder (PTSD) that can affect their overall daily functioning (Fairbank & Fairbank, 2009).

Physical Effects

Traumatic events such as a high magnitude earthquake can impinge loss of limb/vital body organ; sexual abuse can lead to unwanted pregnancies, sexually transmitted diseases, anal/ vaginal itching, etc.; and physical abuse may result in grave injuries and burns. Other physical impacts of traumatic incidents can be exhibited in having problems in sleep, appetite, controlling bladder and stool, unspecified body pain, headache, pseudo seizures, loss of memory, etc.

Risk of Mental Illness

Severe and prolonged exposure to traumatic events in adolescents along with lack of proper treatment and presence of other risk factors can result in the development of psychiatric illness such as post-traumatic stress disorder, acute stress disorder, somatization, adjustment disorder, eating disorder, and obsessive–compulsive disorder. Common comorbid disorders in adolescents with PTSD include mood disorders, behavioural disorders, anxiety disorders (Copeland et al., 2007), and PTSD with/without dissociative disorder (Choi et al., 2019). It is important to understand the comorbidity of PTSD in adolescents as it can influence the diagnostic process, the course, prognosis, and treatment (Burgic & Burgic, 2010).

Behavioural Effects

Trauma can impact adolescent behavior in the following ways: anger, aggressiveness, mood swings, substance addiction, self-harming, suicide, disruptive behavior, conduct problems, hyperactivity, withdrawal, regressive behaviours, and inappropriate sexual behaviour (e.g., in case of sexual abuse).

Effects on Interpersonal Relationship

Trauma may affect the quality of interpersonal and peer relationships of adolescents. Important social consequences of traumatic life events may include poor social competence, reduced peer attachment, delinquent or antisocial activities, and increased risk of trafficking.

Effects on Academic and Non-academic Performance

Sudden deterioration of academic and non-academic performance, attention and concentration difficulties, difficulty in remembering, and retention are some key performance-related issues that adolescents may encounter in the post-trauma phase.

Effects on Emotions

Apart from fear, anger, low mood, guilt, shame, and self-blame, adolescents may experience low self-image, lack of self-esteem, and feeling of hopelessness.

The extent of impacts of any traumatic incident depends largely upon the type and gravity of the trauma, and the risks and protective factors present in the life of the adolescent.

Factors Determining the Impact of Traumatic Events

The followings are a few key factors that play in determining the impact of any traumatic event on an adolescent:

- Age**:** Impact of trauma, particularly intentional or interpersonal trauma could be very damaging in the early adolescence as compared to late adolescence due to continuation of physiological, cognitive, emotional, and social development.
- Sex**:** Female adolescents are more vulnerable to trauma as well as developing psychopathology after trauma if not dealt with appropriately. Boys will be more vulnerable to developing aggressive, deviant, and conduct problems.
- Gender stereotypes and culture: If the society at large, wherein the adolescent lives, has a lot of gender-related stereotypes and stigma in its culture, then social stigma, shame, insecurity, and isolation for the adolescent will increase. And this in turn may contribute to developing psychological problems and may affect their resilience negatively.
- Frequency: Chronic and complex traumatic events have more harmful impacts than a single event.

- Relationships**:** Positive relationships with healthy caregivers help the children recover faster.
- Coping skills: Children having better emotional intelligence, physical health, resilience, optimism, and self-esteem cope well and faster.
- Perception: Cognitive appraisal of the incident and the emotions the adolescent is attaching to trauma-related thoughts and memory influence the development of PTSD or any psychopathology.
- Sensitivity: Every adolescent is unique in that some are more sensitive and emotional than others. Some have a higher stress tolerance threshold than others. Some are expressive and brave to face the challenge they faced but some are not.

A majority of adolescents are resilient and can deal with trauma with minimal amount of careful and sensitive support. It is always crucial to analyse the risk, maintenance, and protective factors in the adolescent so that effective steps can be taken for prevention and intervention.

Signs of Trauma in Adolescents

The following signs can be considered as red flags subsequent to the traumatic incident.

- ***Thought and Cognition***
  - Talks about the trauma incident constantly, or denying that it happened
  - Stays absent mindedness for a significant period and on many occasions
  - Remains disoriented and disinterested
  - Talking about meaninglessness of life, death, suicide, etc.
  - May talk about revenge in specific traumatic incidents
  - Excessive negative thoughts which break the attention and concentration

- ***Behaviour***
  - Refuses to follow rules, or being argumentative frequently
  - Gets involved in risky behaviors such as indication of smoking, alcohol, drug, disinhibited behaviour (over familiarity with known and unknown people, quick to fall into a relationship even after knowing the risk, running away from home, getting involved in illegal activities, etc.)
  - A general increase in aggressive behaviours and may get involved in physical fighting over petty issues
- ***Mood and Emotions***
  - Frequent mood fluctuations
  - Increased agitation and irritability
  - Crying incessantly without any provocation
  - Losing interest in activities enjoyed earlier
  - Being tired all the time, sleeping much more (or less) than usual, having nightmares
- ***Social and Performance***
  - Avoids spending time with friends or sudden social withdrawal from peers and family members
  - Shows lack of interest in studies and/or sudden deterioration in academic performance
- ***Perceptions***
  - Often may scream during sleep
  - May talk with someone who does not exist in real
  - May see or hear something/somebody when actually things/people do not exist in real
- ***Other Red Flag Signs***
  - May harm self or even attempt suicide
  - May lose consciousness or faint or have unresponsive spells, which was not there before the incident.
  - In severe case, may remain in a particular position for long hours.

In a nutshell, caregivers need to be vigilant at least till three months post-traumatic event to notice any significant change in thoughts, emotions, perceptions, behaviours, and performance of the adolescent. Nevertheless, red flag signs and signs of perceptual abnormality require immediate medical attention. The list of signs provided here is not exhaustive rather indicative. Depending on the risk and protective factors, the signs and symptoms vary among adolescents even having same traumatic experience.

Key Theories on Psychological Trauma and PTSD

Some of the key theories linking the impacts of traumatic life incidents and PTSD are stress response theory (Horowitz, 1986), conditioning theory (Keane et al., 1985; Mowrer, 1960), the theory of shattered assumptions (Janoff-Bulman, 1992), information processing theory, and cognitive model (Ehlers & Clark, 2000).

Stress Response Theory: Horowitz (1986) offered a sequence of loss and trauma-related human responses ranging from outcry in the beginning in response to the trauma to active and passive coping mechanisms such as deep-rooted psychological defense mechanisms and assimilating trauma information. While the first response is to avoid memories of the traumatic incidents happening at an unconscious level, the need to integrate the new and old information drives the individual to organize the trauma memories by actively breaking these into intrusions, flashbacks, and nightmares at a consciousness level. As these two opposing processes (one trying to suppress the trauma information and the other trying to process it by bringing it to the conscious level) work simultaneously, there is avoidance of the trauma by the person as well as intrusions of the trauma. This fluctuation helps the person to work through the trauma, leading to reduction of the intensity of traumatic memories (in terms of emotions, thoughts, images, sounds, etc.). Absence of such processing of trauma information results in mental health problems.

Conditioning Theory: This theory explains the role of conditioning response mechanisms of developing fear and anxiety responses. For example, in an adolescent rape case, an unconditioned stimulus (coming back from a friend's house alone) gets associated with an unconditioned fear, intense emotion and anxiety response (rape trauma experience), and may result in strong anxiety and PTSD response (unconditioned response) whenever the adolescent goes out of home alone. Although this theory was initially credited to Mowrer (1960) for his two-factor learning theory, this was expanded by Keane et al. (1985) by explaining the mechanism of maintenance of PTSD reactions. They highlighted processes of stimulus generalization and higher order conditioning emphasizing the role of various associated stimuli in arousing fear. Avoidance of the conditioned stimuli by blocking out the traumatic memories or through distraction will provide short-term relief to the individual, but over long term, it would lead to maintaining of PTSD symptoms as the exposure to traumatic information was incomplete. Extinction could have occurred with repeated exposure to spontaneous memories of the trauma.

Information-Processing Theory: While behavioristic and learning theories primarily focused on the traumatic event and fear conditioning, the information processing theory (Lang, 1979) focused on how the failure of appropriate processing of wider memory or information associated with the personal and social context of that traumatic event could be risk factor for developing psychopathology. Lang proposed that the memory associated with frightening events consists of a fear network consisting of (a) stimulus information about the traumatic event, such as sights and sounds, (b) inputs regarding the emotional and physiological response of the person to the event, and (c) meaning information, regarding the degree of

threat). This fear network stays continuously activated in PTSD resulting in high levels of arousal and persistent re-experiencing (Chemtob et al., 1988), thus making it different from specific phobias. Further, the effects of individual perceptions and subjective meaning on the fear network in PTSD are different from other anxiety disorders (Foa et al., 1989). For example, someone who was raped on a dark and less crowded road would form stronger generalized associations between the characteristics of the road with fear and its behavioural and physiological responses. Now having to walk down on another such road would selectively activate the fear network in memory resulting in (a) the arousal symptoms of PTSD (e.g., making the person hypervigilant, (b) the intrusion symptoms of PTSD (e.g., information in the network entering into the consciousness, and (c) the avoidance symptoms of PTSD (i.e., trying to avoid and suppress the intrusions).

The Theory of Shattered Assumptions: This theory (Janoff-Bulman's, 1992) focuses on shattering of a set of fundamental assumptions of the individual about themselves and the world, in the event of a trauma. It challenges and rejects the deeply held global beliefs and values such as benevolence and worthiness of the self. Coping here involves rebuilding a viable assumptive world.

The theory highlights two aspects: firstly, the *pre-trauma risk factors*, for example, rigidity in one's belief system may increase the risk of PTSD. Rigid positive views or rigid negative views about the self and the world in terms of safety and competency, etc., can be extremely dangerous. Secondly, *negative appraisals of responses and behaviors* related to the traumatic event can intensify the risk factors.

Cognitive Model: Ehlers et al. (2002) focused on the cognitions related to the traumatic event. They highlighted the nature of the trauma memory and the negative cognitive-affective appraisals of the trauma. These are characterized by overgeneralization of danger (e.g., 'I am the only victim') or negative appraisal of own actions (e.g., "whatever I do, it results in negative things'), a sense of numbness ('I can no more form relationship with people') thinking about other people's reactions ('others' think I am no good, and cannot cope on my own') and so on. The prior beliefs and experiences of the person will influence the negative appraisals of the person during and after the trauma.

PTSD in Adolescence

The evidence-based research focusing on the association between trauma and post-traumatic stress symptoms among adolescents has largely stemmed from studies on natural disasters, war, political conflicts, terrorism, trafficking, and maltreatment. The risk factors for PTSD in adolescents are comparable to adults, including the level of exposure, magnitude of loss, extent of disruption of social support systems, and pre-trauma levels of psychopathology (Caffo & Belaise, 2003). These risk factors during adolescence could be a complex set of bio-psycho-social-ecological risk factors operating in various contexts namely self, family, school, peer group, neighbourhood, and virtual world. Risk factors for PTSD in adolescents can be categorized into several

clusters: (i) pre and post-trauma variables, (ii) aggravation of risk factors, and (c) characteristics of the trauma, the child, family, and socio-political-legal systems.

(i) **Pre-post-trauma variables**: Studies point out at the various pre-post-trauma variables such as poor family interaction, low social support, comorbidity of psychological problem, and perceived life threat which determines the development of PTSD in the child after traumatic experience (Trickey et al., 2012).

(ii) **Aggravation of risk factors**: Adolescent experience of trauma can be affected by various potential risk and protective factors such as community context (e.g., poor and low socio-economic condition in neighbourhood), family risk (e.g., dysfunctional family), behavioural maladjustment (e.g., adolescents having internalizing symptoms), cognitive vulnerabilities (e.g., low intellectual ability), and interpersonal problems (e.g., poor/lack of social support). Presence of such factors can aggravate the likelihood of trauma occurrence and experiencing trauma symptoms.

(iii) **Specific Characteristics of the Event, Survivor, Family, and Larger Social Support System**:

(a) ***Characteristics of the Trauma Event***

Studies report that traumatic events such as family violence, death of someone close to the child (McClosky et al., 2000); physical and sexual abuse by caregivers (Alisic et al., 2014); displacement and being refugee (Attanayake et al., 2009); and war (Trickey et al., 2012) increase the risk of PTSD in children. Further, cumulative and complex traumatic events that pose serious life threat are most likely to cause PTSD (McLaughlin et al., 2013).

(b) ***Child Specific Characteristics***

Among the specific characteristics related to the child are female gender (McLaughlin et al., 2013) who may experience certain traumatic events such as rape and sexual assault, which increase the likelihood of post-traumatic stress disorder. Other specific risk factors for PTSD among adolescents are low intelligence, low education level, multiple disability, lower socio-economic status (Margoob et al., 2006, Margoob et al., 2006; Ahmad, 2007). Further, children and adolescents having pre-existing mental disorders such as anxiety and mood disorders are more likely to develop PTSD following a traumatic event than those without a prior mental disorder (Alisic et al., 2014; McLaughlin et al., 2013).

(c) ***Family Specific Characteristics***

Studies have pointed at poor family functioning (La Greca et al., 1996) and parent mental disorders as risk factor for PTSD in children exposed to trauma (Koenen, et al., 2008). However, a good family environment with non-abusive parents reduces the risk of PTSD (Ditlevsen & Elklit, 2010). Secure and healthy attachment patterns with caregivers increase resilience in children which equips the child to deal with

stressful experience (Masten et al., 1990). Social support from parents, teachers, and peers is also another crucial protective factor that can prevent PTSD (Morris et al., 2012).

(d) ***Socio-political-legal Systems***

The first step in institutional support is a well laid out legal framework in any country for dealing with various traumatic exposures, such as providing psychosocial support after natural and manmade disasters, protection of women at workplace/public place, protection of children against sexual abuse, juvenile act, etc. The organizations following a trauma informed environment protocol, ensuring social security and safety, a non-stigmatizing neighbourhood and institutions, less cumbersome legal and administrative hassles to deal with such case, etc., are a part of a supportive social-political and legal system. School as a larger social system can also provide support to adolescent through positive experiences with peers and teachers, and in general creating a positive school experience.

Diagnosis, Assessment, and Intervention for PTSD

Diagnosis

PTSD diagnosis requires the following: presence of a traumatic event, reporting of the trauma event by the child, or other compelling evidence regarding occurrence of the trauma event (e.g., evidence from police, forensic or medical evidence), specific trauma symptoms, passage of at least one month after exposure to the index trauma. Acute PTSD is diagnosed if the symptoms are present for more than one month but less than three months after the index trauma, it is called acute PTSD; whereas chronic PTSD is diagnosed when the symptoms persist beyond three months.

PTSD diagnoses in DSM-5 (APA, 2013) and ICD-11 (WHO, 2018) have been placed under "Trauma & Stress Related Disorder", highlighting changes from the earlier versions of these classification systems. Behavioural symptoms accompanying PTSD have been emphasized with a new symptom cluster 'persistent alterations in mood and cognitions'. The addition of Preschool and Dissociative subtypes of PTSD (specifically for children 6 years younger) is one key change in the DSM-5. Compared to the earlier DSM-IV, the diagnostic criteria for Further, DSM-5 provides details of what constitutes a traumatic event, e.g., sexual assault is specifically included.

Problem Magnitude and Population Profile: International Scenario

The incidence and prevalence of traumatic life incidents has witnessed a sharp increase globally due to the legal frameworks and mandatory reporting of incidents

in many countries in the last few decades. A review of 200 longitudinal studies (Fryers & Brugha, 2013) reported that among other factors, psychological disturbance; adversity; child abuse or neglect; disrupted and dysfunctional families were the significant childhood determinants of adult mental illness.

Exposure to trauma is common among adolescents of 15–16 years of age. Studies indicate that 56% of 6,700 Swiss adolescents experienced at least one traumatic event and more than a third had experienced multiple traumas (Landolt et al., 2013). In the US National Comorbidity Survey for Adolescents (NCS-A) including over 6,400 adolescents, the rate of trauma exposure was just over 60% (McLaughlin et al., 2013). While the point prevalence of PTSD was 4.2% in the Swiss study, the American study reported the lifetime prevalence of PTSD as 4.7%. Both the studies reported the prevalence rates to be significantly higher in girls. In a meta-analysis of 72 cross-sectional studies from North America, Europe, Australia, and Asia, Alisic et al. (2014) reported higher rates of PTSD associated with interpersonal or sexual trauma than exposure to non-interpersonal trauma (25% and 10%, respectively). Hiller et al. (2016) in another meta-analysis of 27 longitudinal studies, estimated PTSD rates of 21% in the acute (1 month) post-trauma phase, spontaneously declining to 15% at 3 months, to 12% at 6 months and to 11% at 1-year post-trauma.

Stephanie et al. (2019) with 2064 young adults in UK and Wales born between 1994 and 95, reported that 31·1% participants reported trauma exposure. Further, trauma-exposed participants had high rates of psychopathology (29·2% had major depressive episode, 22·9% had conduct disorder, and 15·9% had alcohol dependence), risk events (25·0% attempted self-harm, 8·3% had suicide attempts, and 6·6% committed violent offences), and functional impairment. The risk factors for PTSD in trauma-exposed participants included being of female gender, having lower IQ, and disadvantaged socio-economic conditions. Childhood victimization and direct interpersonal index trauma such as physical or sexual abuse can act as significant independent predictors of PTSD with rates as high as 58% (Makley & Falcone, 2010).

Problem Magnitude and Population Profile: Indian Scenario

The prevalence of PTSD among adolescents in India is limited to studies done on disaster-affected adolescents. While post-super cyclone in Odisha, 30.6% of adolescents had a PTSD and 13.6% had a subsyndromal PTSD diagnosis (Kar et al., 2007), one year post-cyclone PTSD came down to 27% but more importantly with a higher comorbidity mental illness in 39% of adolescents (Kar & Bastia, 2006).

While the National Crime Records Bureau (NCRB) every year reports crime against children below 18 years, it includes crimes such as rape, molestation, murder, and suicide separately, thus does not cover trauma or trauma impacts as group of events. The Government of India (2007)'s nationwide survey on child abuse and maltreatment in the age group of 13–18 years in 13 States reported the following: Among the out of school children, 23.2% of faced physical abuse, and 26.5% faced emotional abuse in family settings; whereas among the school-going children, 30.5% faced corporal punishment at school and 49.9% reported sexual abuse. However, this

study was only about indication or trend of child abuse extent in a few States. The study did not assess point or lifetime prevalence rate of trauma, or the extent of mental health impacts of abuse on children below 18 years. There is a requirement to generate a State/city specific or national specific data on traumatic life events among adolescents and the prevalence and course of mental health, particularly PTSD among them. PTSD needs to be defined in terms of contextualization and culturally appropriateness of PTSD manifestations in India (Gilmoor et al., 2019). Majority of studies have explored PTSD with existing western tools that too mainly in natural disasters.

Margoob et al. (Margoob, Khan, et al., 2006; Margoob, Rather, et al., 2006) reported PTSD to be common in children (who reported killing of their parents or they had witnessed death of their relatives, and had exposure to traumatic events) living in orphanages of Kashmir. Almost 50% had psychiatric morbidity and among that 40.62% had diagnosis of PTSD. In a sample of 411 Indian 9th graders with a mean age of 14.15 years, Rasmussen et al. (2013) found 70% of the females and 85% of the males had been exposed to or witnessed at least one traumatizing or negative life event. The prevalence of PTSD was 10%.

Differences in prevalence estimates for PTSD may be due to varied assessment methods and tools used, sample size and sampling methods, the lack of developmental sensitivity in diagnostic frameworks; lack of cultural sensitivity in diagnostic criteria of PTSD symptomatology manifestation; and the changing diagnostic criteria for PTSD in different time periods.

Assessment of PTSD

Given the importance of early diagnosis and treatment for PTSD, the clinician needs to routinely ask the child and explore possible exposure to commonly experienced traumatic events (such as child abuse, domestic or community violence, or serious accidents) and then assess for the presence of PTSD symptoms in case of reported trauma experiences.

In cases of specific trauma-related referral, an inclusive clinical assessment of PTSD among adolescents will include three key features—initial screening, detailed clinical evaluation, and treatment planning. Following are certain important points to be noted during assessment:

- Obtaining reliable information through multiple informants/sources is important in making a holistic assessment, accurate diagnosis, and consequently, comprehensive treatment planning.
- Objective observation of congruence between verbal and non-verbal body language of the patient and other informants is very crucial to understand clinical as well as other psychological aspects of the illness.
- Informed written consent is crucial for interviewing or assessing. Further, refusal of assessment or treatment should also be documented/recorded.

- Confidentiality and limit setting rules should also be explained to the adolescents.
- The purpose of any assessment and how would that help in patient's treatment and recovery should be explained before any formal assessment.
- The clinical assessment should comprise detailed history taking, observation, clinical interview, and application of some clinical screening scales or PTSD severity measures.
- Selecting a screening tool or PTSD severity measure or comorbid mental illness should be culturally compatible and psychometrically tested tools. Language compatibility is also very important to improve the diagnostic/screening accuracy.

The clinician thus needs to proceed with sensitivity and establish adequate rapport with the adolescent before assessment.

What Needs to Be Assessed?

If the screening assessment suggests PTSD, then a detailed assessment to outline the severity has to be done. The assessment is aimed to facilitate the treatment, both pharmacological and psychological.

PTSD can comorbid with other mental illnesses such as depression and anxiety disorders. Careful assessment of externalizing and internalizing behavior problems, and suicide or self-harm risks is also required. Impairment in daily functioning and self-care needs to be noted. PTSD symptoms may be similar to the characteristic of oppositional defiant disorder and attention deficit and hyperactivity disorder in that there may be irritability, anger, hypervigilant motor activity, and hyperarousal symptoms. Sensorium impairment and fluctuating levels of consciousness should also be carefully assessed and differentiated from psychosis. Assessment of somatic symptoms, cognitive appraisal of the trauma incident and people associated will be helpful in charting the psychological intervention sessions. Exploring the strengths and potentials of adolescents is also beneficial in this.

Adolescents who re-experience thoughts/emotions, it is important to frame open-ended questions before the interview/assessment. For instance, a question which yields a yes/no should be avoided (e.g., "Do you have distress at reminders of your past event?"). Reframing the question such as "When you went past the house where the event occurred, what thoughts came to your mind and how did you feel?" would yield more information on psychopathology.

Various tools can be used for screening of PTSD along with the diagnostic interviews. Juvenile Victimization Questionnaire (Finkelhor et al., 2005) validated for ethnically diverse samples of children 2–17 years of age is an important tool to determine whether children have been exposed to qualifying traumatic experiences.

Self-report measurements for PTSD such as the University of California at Los Angeles (UCLA) Post-traumatic Stress Disorder Reaction Index (Steinberg et al., 2004); the Child PTSD Symptom Scale (CPSS- Foa et al., 2001, 2018); Trauma Symptom Checklist (Briere, 1996) can help in PTSD screening and also monitoring

response to treatment. The CRIES-8 (Perrin et al., 2005) and the Impact of Events Scale (Horowitz et al., 1979) can be used for detailed clinical assessment, and also as an outcome tool.

The choice of an appropriate tool for PTSD screening needs to be based on the cultural compatibility, need, and other suitability factors. It is important that assessment is broad-based (assessing symptoms of other psychological problems also), multimodal (using both interview and questionnaire), and multi-informant (collecting information from the child/adolescent and the caregiver) so that it can result in effective psychological intervention.

Evidence-Based Intervention/Treatment

Counselors and psychotherapists dealing with adolescent trauma survivors need to keep in mind two specific points: (a) trauma can affect several developmental domains during adolescence namely, attachment systems, neurobiology, emotion regulation, behavioural control, cognitive aspects, personality, attitudes and self-concept, and (b) adolescence is a favourable stage for any therapeutic activity to reduce symptomatology and restore normal developmental domains.

Psychotherapy can be a stand-alone therapy or can be an adjunct therapy with medication for mild to moderate symptoms of PTSD. Medication can be given when there is severe anxiety, fear, and hopelessness so that the adolescent feels calmer to apply the coping strategies learned in therapy. The objectives of psychotherapy for an adolescent with PTSD are to identify trauma-specific thoughts, emotions, behaviours, specific coping strategies, and self-efficacy. It aims at helping adolescents to identify and regulate various emotions related to trauma, process the trauma-specific memories, learning not to engage in self-blame or guilt, consciously adopt positive coping mechanisms, and restore trust in people around. The focus of any psychotherapy can be customized depending on the adolescent's symptoms, his/her priority, nature of trauma, and other considerations. Family psychotherapy can also be planned along with individual psychotherapy, in case intrafamilial trauma or trauma has a link to family members or for wellness of family members.

In fact the choice of type of psychological intervention will largely depend upon the type of trauma, stage-specific symptoms, target outcomes, and suitability of setting where an intervention will be carried out. The intervention can be clinic/hospital, school, or community based. The format can be individual, group, and combination of both, if required. It can also be done online.

Trauma treatment for adolescents is broadly of two types: trauma counselling and psychotherapies in general along with trauma-focused psychotherapy. Trauma-focused psychotherapies are the first line of treatment for children and adolescents with PTSD. With a moderately robust empirical support, Trauma-Focused Cognitive Behavioural Therapy (TFCBT) is the preferred and widely used non-pharmacological treatment for children and adolescents who encounter traumatic life events. It is a structured conjoint parent–child psychological treatment protocol (Cohen et al.,

2000), which predominantly follows cognitive-behavioural-cum learning principles and exposure techniques to prevent and treat psychological trauma and its associated problems. Rational emotive behaviour therapy (REBT), dialectical behaviour therapy (DBT), eye movement desensitization therapy (EMDR), and abuse-focused therapies are also gaining empirical evidence in PTSD symptom reduction.

In the developing countries like India, childhood trauma is overlooked, underestimated and underreported, but at the same time it is very much prevalent in the form of exposure to child abuse, rape, trafficking, domestic violence, natural and man-made disasters, death and accidents of significant family members. Frequency of disasters in the country, poor socio-economic background, and chronic illness in self or family can result in multiple traumas in children. Although many evidence-based therapeutic models are available, cultural adaptation of these models according to the needs of Indian adolescents with PTSD is very important as the symptom manifestation and other key socio- cultural- and familial variables are very different in India as compared to the West. Customization and validation is recommended.

Role of Parents

The role of parents is very significant in recognizing and normalizing adolescents' thoughts, emotions, and behaviours exhibited after the traumatic life experiences. They can facilitate the post-traumatic adjustment of the child/adolescent. Parents are able to influence the engagement of the child with trauma-related material (Cobham et al., 2016). They provide a sense of security and model adaptive coping (e.g., Marsac et al., 2016).

Parent–child relationships affect the trauma memories and the appraisal of trauma events by the adolescent. Authoritative (warm and democratic) parenting style is negatively related to post-traumatic symptoms in adolescents, whereas authoritarian (restrictive and hostile) parenting is positively related to it (Zhai et al., 2015).

Hence, parents need to provide a healthy family environment to the growing adolescent and adopt principles of positive parenting. They need to control their own overwhelming emotions by not reacting, rather responding to the situation. Further, being available and acceptable to your child/adolescent is pertinent for discussing trauma-related distress. Listening to your adolescent and being extremely vigilant about any self-harm behavior is very important.

Finally, parents need to be loving, warm, and supportive, rather than being overprotective towards the adolescents. As parents, just behave the way you used to behave with the child before the trauma incident. The adolescent may have stigma related to seeking professional mental health support and parents play an important role in reducing it. Offering professional help seeking as immediately as possible in case anything goes beyond your management/control/handle.

Conclusion

Adolescence is an important stage of brain, body, and personality development. Traumatic life events are potential threats to disrupt these developmental processes. Both traumatic life incidents and the post-traumatic stress/reactions are common during adolescence. Post-traumatic stress is normal and adaptive response while PTSD/cPTSD is a complex mental disorder affecting functioning of adolescents, their quality of life, and well-being. Young people with PTSD can have complex comorbid psychopathology, particularly depression and panic attacks, which could mask the diagnosis of PTSD in trauma-exposed young people, and thus require comprehensive psychiatric assessment and treatment (Lewis et al., 2019).

The chapter discussed the diagnosis, assessment, and intervention for PTSD. Trauma-focused psychotherapy is considered the first line of treatment for adolescents with PTSD. Early identification and prevention is one critical issue that needs to be addressed in research on PTSD. Parents and other caregivers play a significant role not only in adaptive processing of such experiences but they are also crucial in the early identification of PTSD signs and treatment seeking.

There is a need for integrating enquiry of trauma exposure in adolescents in regular clinical practice. This will help in timely identification and intervention. Research also needs to focus on appropriate efficacious intervention for PTSD prevention, especially finding out the maintaining of the treatment effects in long intervention studies. Keeping the skewed ratio of mental health specialists and adolescents needing help, large-scale evaluations of treatment effectiveness of established interventions in nonspecialist community settings are needed (Smith et al., 2019).

Another critical issue is that although the trauma exposure of adolescents in low and middle-income countries is high, the evidence for clinical practice of established interventions (such as TFCBT, or adapted CBT) is almost non-existent. Hence, cultural adaptation of such intervention at research level can be facilitated if such interventions are clinically applied first. Since research and clinical practice in the area of adolescent PTSD is extremely limited in India, various issues described here need to be addressed urgently by Indian clinicians and researchers.

Time to Reflect

Adolescence is a crucial stage of development which marks the process of identity formation. Traumatic stress at this stage negatively impacts their development in all aspects. The key is preventing avoidable traumas and ensuring availability of proper resources and support measures in case of trauma exposure and experience by children and adolescents. Collectivistic societies and cultures offer a variety of support and are characterized by socialization process different from individualistic societies. Collectivistic societies offer support to the vulnerable group of children through the close-knit system of family and society. However, many cases of trauma, e.g., child

abuse including physical, sexual and emotional, domestic violence impacting children, cyber victimization, etc., are also rising in such societies. Reflect on what are the implications of collectivistic versus individualistic societies on trauma occurrence, experience, and processing in adolescents?

References

Ahmed, M. B. (2007). Effect of terrorism on children's psychosocial biological understanding. *JIMA, 39*, 65.

Alisic, E., Zalta, A. K., van Wesel, F., et al. (2014). Rates of post-traumatic stress disorder in trauma-exposed children and adolescents: Meta-analysis. *British Journal of Psychiatry, 204*, 335.

American Psychiatric Association. (2013). *Trauma- and stressor-related disorders, in diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Publishing.

American Psychological Association (APA) (2015). *APA presidential task force on PTSD and trauma in children and adolescents: Children and trauma, tips for mental health professionals.* http://www.apa.org/pi/families/resources/tips.pdf

Attanayake, V., McKay, R., Joffres, M., et al. (2009). Prevalence of mental disorders among children exposed to war: A systematic review of 7,920 children. *Medicine, Conflict, and Survival, 25*, 4.

Briere, J. (1996). *Trauma symptom checklist for children* (TSCC). Psychological Assessment Resources.

Breslau, N., Lucia, V. C., & Alvarado, G. F. (2006). Intelligence and other predisposing factors in exposure to trauma and posttraumatic stress disorder: A follow-up study at age 17 years. *Archives of General Psychiatry, 63*, 1238–1245.

Brette, F. (2004). Trauma. In A. de Mijolla (Ed.), *International dictionary of psychoanalysis.* Macmillan Library Reference

Bryant, R. A., & Panasetis, P. (2001). Panic symptoms during trauma and acute stress disorder. *Behaviour Research and Therapy, 39*, 961–966.

Burgic-Radmanovic, M., & Burgic, S. (2010). Comorbidity in children and adolescent psychiatry. *Psychiatriy Danub, 22*(2), 298–300.

Caffo, E., & Belaise, C. (2003). Psychological aspects of traumatic injury in children and adolescents. *Child and Adolescent Psychiatry Clinic N America, 12*(3), 493–535.

Carrion, V. G., Weems, C. F., Richert, K., Hoffman, B. C., & Reiss, A. L. (2010). Decreased prefrontal cortical volume associated with increased bedtime cortisol in traumatized youth. *Biological Psychiatry, 68*, 491–493. https://doi.org/10.1016/j.biopsych.2010.05.010 [PubMed: 20579974].

Chemtob, C., Roitblat, H. L., Hamada, R. S., Carlson, J. G., & Twentyman, C. T. (1988). A cognitive-action theory of post-traumatic stress disorder. *Journal of Anxiety Disorders, 2*, 253–275.

Choi, K. R., Ford, J. D., Briggs, E. C., Munro-Kramer, M. L., Graham-Bermann, S. A., & Seng, J. S. (2019). Relationships between maltreatment, posttraumatic symptomatology, and the dissociative subtype of PTSD among adolescents. *Journal of Trauma & Dissociation, 20*(2), 212–227. https://doi.org/10.1080/15299732.2019.1572043

Cloitre, M., Stolbach, B. C., Herman, J. L., van der Kolk, B., Pynoos, R., Wang, J., et al. (2009). A developmental approach to complex PTSD: Childhood and adult cumulative trauma as predictors of symptom complexity. *Journal of Traumatic Stress, 22*, 399–408. https://doi.org/10.1002/jts.20444

Cloitre, M., Garvert, D. W., Brewin, C. R., Bryant, R. A., & Maercker, A. (2013). *Evidence for proposed ICD-11 PTSD and complex PTSD: A latent profile analysis.*

Cobham, V. E., Cobham, B., McDermott, D., Haslam, M. R., & Sanders. (2016). The role of parents, parenting and the family environment in children's post-disaster mental health. *Current Psychiatry Reports, 18*, 53. https://doi.org/10.1007/s11920-016-0691-4

Cohen, J. A., Mannarino, A. P., Berliner, L., & Deblinger, E. (2000). Trauma-focused cognitive behavioral therapy for children and adolescents: An empirical update. *Journal of Interpersonal Violence, 15*(11), 1202–1223. https://doi.org/10.1177/088626000015011007

Cook, A., Blaustein, M., Spinazzola, J., & van der Kolk, B. (Eds.) (2003). *Complex trauma in children and adolescents: White paper from the national child traumatic stress network, complex trauma task force.* National Child Traumatic Stress Network.

Cook, A., Spinazzola, J., Ford, J., Lanktree, C., Blaustein, M., Cloitre, M., et al. (2005). Complex trauma in children and adolescents. *Psychiatric Annals, 35*, 390–398.

Copeland, W. E., Keeler, G., Angold, A., & Costello, E. J. (2007). Traumatic events and posttraumatic stress in childhood. *Archives of General Psychiatry, 64*, 577–584.

Corrigan, N. M., Yarnykh, V. L., Hippe, D. S., Owen, J. P., Huber, E., Zhao, T. C., & Kuhl, P. K. (2021). Myelin development in cerebral gray and white matter during adolescence and late childhood. *Neuroimage, 227*, 117678. https://doi.org/10.1016/j.neuroimage.2020.117678

Davydow, D. S., Richardson, L. P., Zatzick, D. F., Kaaton, W. J. (2010). Psychiatric morbidity in pediatric critical illness survivors: A comprehensive review of the literature. *Archives of Pediatrics Adolescent*, 164–377.

Ditlevsen, D. N., & Elklit, A. (2010). The combined effect of gender and age on post-traumatic stress disorder: Do men and women show differences in the lifespan distribution of the disorder? *Annals of General Psychiatry, 9*, 32. https://doi.org/10.1186/1744-859X-9-32

Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy, 38*, 319–345.

Ehlers, A., Hackmann, A., Steil, R., Clohessy, S., Wenninger, K., Winter, H. (2002). The nature of intrusive memories after trauma: The warning signal hypothesis. *Behaviour Research and Therapy, 40*(9), 995–1002. https://doi.org/10.1016/s0005-7967(01)00077-8. PMID: 12296496.

Elklit, A., Hyland, P., & Shevlin, M. (2014). Evidence of symptom profiles consistent with post-traumatic stress disorder and complex posttraumatic stress disorder in different trauma samples. *European Journal of Psychotraumatology, 5*, 24221.

Fairbank, J. A., & Faribank, D. W. (2009). Epidemiology of child traumatic stress. *Current Psychiatry Reports, 11*(4), 289–295.

Finkelhor, D., Hamby, S. L., Ormrod, R., & Turner, H. (2005). The Juvenile Victimization Questionnaire: Reliability, validity, and national norms. *Child Abuse and Neglect, 29*(4), 383–412.

Foa, E. B., Steketee, G., & Rothbaum, B. O. (1989). Behavioral/cognitive conceptualisation of post-traumatic stress disorder. *Behavior Therapy, 20*, 155–176.

Foa, E. B., Johnson, K. M., Feeny, N. C., & Treadwell, K. R. H. (2001). The child PTSD symptom scale: A preliminary examination of its psychometric properties. *Journal of Clinical Child Psychology, 30*, 376–384.

Foa, E. B., Asnaani, A., Zang, Y., Capaldi, S., & Yeh, R. (2018). Psychometrics of the child PTSD symptom scale for DSM-5 for trauma-exposed children and adolescents. *Journal of Clinical Child & Adolescent Psychology, 47*(1), 38–46. https://doi.org/10.1080/15374416.2017.1350962

Fryers, T., & Brugha, T. (2013). Childhood determinants of adult psychiatric disorder. *Clinical Practice & Epidemiology in Mental Health, 9*, 1–50.

Gilmoor, A. R., Adithy, A., & Regeer, B. (2019). The cross-cultural validity of post-traumatic stress disorder and post-traumatic stress symptoms in the Indian context: A systematic search and review. *Frontiers in Psychiatry, 10*, 439. https://doi.org/10.3389/fpsyt.2019.00439

Gluck, T. M., Knefel, M., Tran, U. S., & Lueger-Schuster, B. (2016). PTSD in ICD-10 and proposed ICD-11 in elderly with childhood trauma: Prevalence, factor structure, and symptom profiles. *European Journal of Psychotraumatology, 7*, 29700.

Govt. of India (2007). *Study on child abuse: India.* Ministry of Women and Child Development, Government of India.

Hales, R. E., & Yudofsky, S. C. (2003). *Textbook of clinical psychiatry*. The American Psychiatric Publishing.
Hansen, M., Hyland, P., Armour, C., Shevlin, M., & Elklit, A. (2015). Less is more? Assessing the validity of the ICD-11 model of PTSD across multiple trauma samples. *European Journal of Psychotraumatology, 6*, 28766.
Heller, L., & Pierre, L. (2012). *Healing developmental trauma: How early trauma affects self-regulation, self-image, and the capacity for relationship*. North Atlantic Books.
Hiller, M. R., Meiser-Stedman, R., Fearon, P., Labo, S., McKinnon, A., Fraser, A., & Halligan, L. S. (2016). Research review: Changes in the prevalence and symptom severity of child post-traumatic stress disorder in the year following trauma—A meta-analytic study. *Journal of Child Psychology & Psychiatry, 57*(8), 884–898. https://doi.org/10.1111/jcpp.12566
Horowitz, M. J. (1986). *Stress response syndromes* (2nd ed.). Jason Aronson.
Horowitz, M. J., Wilner, N., & Alvarez, W. (1979). Impact of events scale: A measure of subjective stress. *Psychosomatic Medicine, 41*, 209–218.
Hyland, P., Shevlin, M., Brewin, C. R., Cloitre, M., Downes, A. J., Jumbe, S., & Roberts, N. P. (2017). Factorial and discriminant validity of ICD-11 PTSD and CPTSD using the new international trauma Questionnaire. *Acta Psychiatrica Scandinavica, 136*, 231–338.
Hyland, P., Shevlin, M., Elklit, A., Murphy, J., Vallières, F., Garvert, D. W., & Cloitre, M. (2017). An assessment of the construct validity of the ICD-11 proposal for complex posttraumatic stress disorder. *Psychological Trauma: Theory, Research, Practice, and Policy, 9*, 1–9. https://doi.org/10.1037/tra0000114
Janoff-Bulman, R. (1992). *Shattered assumptions: Towards a new psychology of trauma*. Free Press.
Kar, N., & Bastia, B. K. (2006). Post-traumatic stress disorder, depression and generalised anxiety disorder in adolescents after a natural disaster: A study of comorbidity. *Clinical Practice and Epidemiology in Mental Health, 26*(2), 17.
Kar, N., Mohapatra, P. K., Nayak, K. C., Pattanaik, P., Swain, S. P., & Kar, H. C. (2007). Post-traumatic stress disorder in children and adolescents one year after a super-cyclone in Orissa, India: Exploring cross-cultural validity and vulnerability factors. *BMC Psychiatry, 14*(7), 8.
Keane, T. M., Zimering, R. T., & Caddell, R. T. (1985). A behavioral formulation of PTSD in Vietnam veterans. *Behavior Therapist, 8*, 9–12.
Kessler, R. C., Avenevoli, S., Costello, E. J., et al. (2012). Prevalence, persistence, and sociodemographic correlates of DSM-IV disorders in the national comorbidity survey replication adolescent supplement. *Archives of General Psychiatry, 69*, 372–380.
Knefel, M., Garvert, D. W., Cloitre, M., & Lueger-Schuster, B. (2015). Update to an evaluation of ICD-11 PTSD and complex PTSD criteria in a sample of adult survivors of childhood institutional abuse by Knefel & Lueger-Schuster (2013): A latent profile analysis. *European Journal of Psychotraumatology, 6*, 25290.
Koenen, K. C., Moffitt, T. E., Caspi, A., et al. (2008). The developmental mental-disorder histories of adults with posttraumatic stress disorder: A prospective longitudinal birthcohort study. *Journal of Abnormal Psychology, 117*, 460.
La Greca, A., Silverman, W. K., Vernberg, E. M., & Prinstein, M. J. (1996). Symptoms of posttraumatic stress in children after Hurricane Andrew: A prospective study. *Journal of Consulting and Clinical Psychology, 64*, 712.
La Greca, A. M., Lai, B. S., Llabre, M. M., Silverman, W. K., Vernberg, E. M., & Prinstein, M. J. (2013). Children's post disaster trajectories of PTS symptoms: Predicting chronic distress. *Child Young Care Forum, 42*, 351–369.
Landolt, M. A., Schnyder, U., Maier, T., Schoenbucher, V., & Mohler-Kuo, M. (2013). Trauma exposure and posttraumatic stress disorder in adolescents: A national survey in Switzerland. *Journal of Traumatic Stress, 26*, 209–216.
Lang, P. J. (1979). A bio-informational theory of emotional imagery. *Psychophysiology, 16*(6), 495–512.
Lewis, J. S., Arseneault, L., Caspi, A., Fisher, L. H., Matthews, T., Moffitt, T. E., Odgers, C. L., Stahl, D., Teng, J. Y., & Danese, A. (2019). The epidemiology of trauma and post-traumatic stress

disorder in a representative cohort of young people in England and Wales. *Lancet Psychiatry, 6*, 247–256.

Lupien, S. J., McEwen, B. S., Gunnar, M. R., & Heim, C. (2009). Effects of stress throughout the lifespan on the brain, behaviour and cognition. *Nature Reviews Neuroscience, 10*, 434–445. https://doi.org/10.1038/nrn2639

Maercker, A., Brewin, C. R., Bryant, R. A., Cloitre, M., Reed, G. M., Van Ommeren, M., & Saxena, S. (2013). Proposals for mental disorders specifically associated with stress in the international classification of diseases. *Lancet, 381*(9878), 1683–1685.

Makley, A. T., & Falcone, R. A., Jr. (2010). Posttraumatic stress disorder in the paediatric trauma patient. *Seminars in Pediatric Surgery, 19*(4), 292–299. https://doi.org/10.1053/j.sempedsurg.2010.06.006

Masten, A. S., Morison, P., Pellegrini, D., & Tellegen, A. (1990). Competence under stress: Risk and protective factors. In J. Rolf, A. S. Masten, D. Cicchetti, K. H. Nuechterlein, & S. Weintraub (Eds.), *Risk and protective factors in the development of psychopathology* (pp. 237–256). Cambridge University Press.

Margoob, M. A., Khan, A. Y., & Mushtaq, H. (2006a). PTSD symptoms among children and adolescents as a result of mass trauma in south Asian region: Experience from Kashmir. *JK-Practitioner, 13*(Suppl 1), S45–S48.

Margoob, M. A., Rather, Y. H., Khan, A. Y., Singh, G. P., Malik, Y. A., & Firdosi, M. M. (2006b). Psychiatric disorders among children living in orphanages—experience from Kashmir. *JK-Practitioner, 13*(11), S53–S55.

Marsac, M. L., & Kassam-Adams, A. N. (2016). **N**ovel adaptation of a parent-child observational assessment tool for appraisals and coping in children exposed to acute trauma. *European Journal of Psychotraumatology, 7*, 31879. https://doi.org/10.3402/ejpt.v7.31879

McCloskey, L. A., et al. (2000). Post traumatic stress in children exposed to family violence and single-event trauma. *Journal of the American Academy of Child and Adolescent Psychiatry, 39*(1), 108–115.

McLaughlin, K. A., Koenen, K. C., Hill, E. D., Petukhova, M., Sampson, N. A., Zaslavsky, A. M., & Kessler, R. C. (2013). Trauma exposure and posttraumatic stress disorder in a national sample of adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 52*, 815–830.

Morris, A., Gabert-Quillen, C., & Delahanty, D. (2012). The association between parent PTSD/depression symptoms and child PTSD symptoms: A meta-analysis. *Journal of Pediatric Psychology, 37*, 1076.

Mowrer, O. H. (1960). *Learning theory and behavior*. Wiley.

National Crime Records. *Crime in India—2017 & 2018*. National Crime Records Bureau, Ministry of Home Affairs, Government of India, New Delhi, India.

Norwood, A. E., Ursano, R. J., & Fullerton, C. S. (2000). Disaster psychiatry: Principles and practice. *Psychiatric Quarterly, 71*(3), 207–226. https://doi.org/10.1023/A:1004678010161

Pavlov, I. P. (1960). *Conditioned reflexes: An investigation of the physiological activity of the cerebral cortex*. Oxford University Press.

Perkonigg, A., Hoffler, M., Wittchen, H. U., Trautmann, S., & Maercker, A. (2014). Evidence for the ICD-11 definitions of PTSD and complex PTSD among youth and young adults. In A. Maercker & B. Lueger-Schuster (Chairs), *Symposium: PTSD and complex PTSD: Studies on the proposed new definitions of the disorders for ICD-11*. he German Speaking Society on Psychotraumatology.

Perrin, S., Meiser-Stedman, R., & Smith, P. (2005). The children's revised impact of event scale (CRIES): Validity as a screening instrument for PTSD. *Behavioural and Cognitive Psychotherapy, 33*(4), 487–498. https://doi.org/10.1017/S1352465805002419

Porges, S. W. (2001). The polyvagal theory: Phylogenetic substrates of a social nervous system. *International Journal of Psychophysiology, 42*(2), 123–146. https://doi.org/10.1016/S0167-8760(01)00162-3.ISSN0167-8760

Rajkumar, A. P., Mohan, T. S. P., & Tharyan, P. (2013). Lessons from the 2004 Asian tsunami: Epidemiological and nosological debates in the diagnosis of post-traumatic stress disorder in

non-Western post-disaster communities. *International Journal of Social Psychiatry, 59*, 123–129. https://doi.org/10.1177/0020764011423468

Rasmussen, D. J., Karsberg, K. K.-I., & Elklit, A. (2013). Victimization and PTSD in an Indian youth sample from Pune City. *Open Journal of Epidemiology, 3*, 12–19.https://doi.org/10.4236/ojepi.2013.31003

Sachser, C., Keller, F., & Goldbeck, L. (2016). Complex PTSD as proposed for ICD-11: Validation of a new disorder in children and adolescents and their response to trauma-focused cognitive behavioral therapy. *Journal of Child Psychology and Psychiatry, 58*, 160–168.

Saakvitne, K. W., Gamble, S. J., Pearlman, L. A., & Lev, B. T. (2000). *Risking connection: A training curriculum for working with survivors of childhood abuse.* Sidran.

Selye, H. (1956). *The stress of life*. McGraw-Hill.

Shaw, J. (2002). Children, adolescents and trauma. *Psychiatry Quarterly, 71*(3), 227–243.

Shevlin, M., Hyland, P., Karatzias, T., Fyvie, C., Roberts, N., Bisson, J. I., & Cloitre, M. (2017). Alternative models of disorders of traumatic stress based on the new ICD-11 proposals. *Acta Psychiatrica Scandinavica, 135*(5), 419–428. https://doi.org/10.1111/acps.12695

Smith, P., Dalgleish, T., & Meiser-Stedman, R. (2019). Practitioner review: Posttraumatic stress disorder and its treatment in children and adolescents. *Journal of Child Psychology and Psychiatry, 60*(5), 500–515.

Steinberg, A. M., Brymer, M. J., Decker, K. B., & Pynoos, R. S. (2004). The UCLA PTSD reaction index. *Current Psychiatry Reports, 6*(2), 96–100.

Stephanie, J. L., Arseneault, L., Avshalom, C., Fisher, H. L., Matthews, T., Moffitt, T. E., Odgers, C. L., Stahl, D., Teng, J. Y., & Danese, A. (2019). The epidemiology of trauma and post-traumatic stress disorder in a representative cohort of young people in England and Wales. *Lancet Psychiatry, 6*, 247–256.

Trickey, D., Siddaway, A. P., Meiser-Stedman, R., Serpell, L., & Field, A. P. (2012). A meta-analysis of risk factors for post-traumatic stress disorder in children and adolescents. *Clinical Psychology Review, 32*(2), 122–138.https://doi.org/10.1016/j.cpr.2011.12.001

van der Kolk (2000). The diagnosis and treatment of complex PTSD. In R. Yehuda (Ed.), *Current treatment of PTSD*. American Psychiatric Press.

Williamson, V., Creswell, C., Butler, I., Christie, H., & Halligan, S. L. (2016). Parental responses to child experiences of trauma following presentation at emergency departments: A qualitative study. *BMJ Open, 6*.https://doi.org/10.1136/bmjopen-2016-012944

Zhai, Y., Liu, K., Zhang, L., Gao, H., Chen, Z., Du, S., et al. (2015). The relationship between posttraumatic symptoms, parenting style, and resilience among adolescents in Liaoning, China: A cross-sectional study. *PLoS ONE, 10*(10), e0141102. https://doi.org/10.1371/journal.pone.0141102

Webb, N. B. (2004). A developmental-transactional framework for assessment of children and families following a mass trauma. In N. B. Webb (Ed.), *Social work practice with children and families. Mass trauma and violence: Helping families and children cope* (pp. 23–49). Guilford Press.

World Health Organization (WHO) (2018). *International classification of diseases, 11th revision (ICD-11).* WHO. http://www.who.int/classifications/icd/en/