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Post Traumatic Stress Disorder – An Overview

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1. Introduction

Posttraumatic stress disorder (PTSD) is a severe anxiety disorder that can develop after exposure to any event that result in psychological trauma. This event may involve the threat of death to oneself or to someone else, or to one's own or someone else's physical, sexual, or psychological integrity, overwhelming the individual's ability to cope. As an effect of psychological trauma, PTSD is less frequent but more enduring than the more commonly seen acute stress response. Post-traumatic Stress Disorder (PTSD) is a persistent and sometimes crippling condition and develops in a significant proportion of individuals exposed to trauma, and untreated, can continue for years. Its symptoms can affect every life domain – physiological, psychological, occupational, and social.

Posttraumatic stress disorder (PTSD) was first introduced into the Diagnostic and Statistical Manual of Mental Disorders (DSM) in 1980, making it one of the more recently accepted psychiatric disorders. PTSD is one of the few DSM diagnoses to have a recognizable etiologic agent, in that it must develop in direct response to a severe (sudden, terrifying, or shocking) life event (American Psychiatric Association 2000). Since the introduction of PTSD into DSM-III (American Psychiatric Association 1980), the disorder has been documented in children exposed to traumas such as domestic violence, natural disasters, medical trauma (such as hospitalization or medical procedures performed on children), war, terrorism, and community violence.

According to the American Psychological Association, posttraumatic stress disorder (PTSD) is defined as "an anxiety disorder that can develop after exposure to a terrifying event or ordeal in which grave physical harm occurred or was threatened. Traumatic events that may trigger PTSD include violent personal assaults, natural or human-caused disasters, such as terrorist attacks, motor vehicle accidents, rape, physical and sexual abuse, and other crimes, or military combat [1]."

PTSD is a problem in which the human brain continues to react with nervousness after the horrific trauma even though the original trauma is over. Brain can react by staying in "overdrive" and being hyperalert in preparation for the next possible trauma. Sometimes the brain continues to "remember" the trauma by having "flashbacks" about the event or nightmares even though the trauma was in the past.

2. Historical background

Reports of battle-associated stress reactions appeared as early as the 6th century BC. One of the first descriptions of PTSD was made by the Greek historian Herodotus. In 490 BC

Herodotus described, during the Battle of Marathon, an Athenian soldier who suffered no injury from war but became permanently blind after witnessing the death of a fellow soldier. In the early 19th century military medical doctors started diagnosing soldiers with "exhaustion" after the stress of battle. This "exhaustion" was characterized by mental shutdown due to individual or group trauma. Soldiers during the 19th century were not supposed to be scared or show any fear in the midst of battle. The only treatment for this "exhaustion" was to bring the afflicted back for a bit for a short term therapy and then send them back into battle. During the intense and frequently repeated stress, the soldiers became fatigued as a part of their body's natural shock reaction. According to Stéphane Audoin-Rouzeau and Annette Becker, "One-tenth of mobilized American men were hospitalized for mental disturbances between 1942 and 1945, and after thirty-five days of uninterrupted combat, 98% of them manifested psychiatric disturbances in varying degrees."

Previous diagnoses now considered historical equivalents of PTSD include railway spine, stress syndrome, shell shock, battle fatigue, or traumatic war neurosis. Although PTSD-like symptoms have also been recognized in combat veterans of many military conflicts, the modern understanding of PTSD dates from the 1970s, largely as a result of the problems that were still being experienced by US military veterans of the war in Vietnam. In its initial DSM-III (formulation 1980), a traumatic event was conceptualized as a catastrophic stressor that was outside the range of usual human experience. The framers of the original PTSD diagnosis had in mind events such as war, torture, rape, the Nazi Holocaust, the atomic bombings of Hiroshima and Nagasaki, natural disasters (such as earthquakes, hurricanes, and volcano eruptions) and human-made disasters (such as factory explosions, airplane crashes, and automobile accidents). They considered traumatic events as clearly different from the very painful stressors that constitute the normal vicissitudes of life such as divorce, failure, rejection, serious illness and financial reverses. (By this logic adverse psychological responses to such "ordinary stressors" would, in DSM-III terms, be characterized as Adjustment Disorders rather than PTSD.) This dichotomization between traumatic and other stressors was based on the assumption that although most individuals have the ability to cope with ordinary stress, their adaptive capacities are likely to be overwhelmed when confronted by a traumatic stressor.

The DSM-III diagnostic criteria for PTSD were revised in DSM-III-R (1987) and DSM-IV (1994) [2]. A very similar syndrome is classified in ICD-10 [3]. Since 1980 there has been a great deal of attention devoted to the development of instruments for assessing PTSD. Although an optimal evaluation of a patient for PTSD consists of a face-to-face interview by a mental health professional trained in diagnosing psychiatric disorders, several instruments are available to facilitate the diagnosis and assessment of posttraumatic stress disorder (PTSD). These include screening tools, diagnostic instruments, and trauma and symptom severity scales. For example, there are brief screening tools, such as the 4-item Primary Care PTSD Screen, developed by the Department of Veterans Affairs National Center for Posttraumatic Stress Disorder; self-report screening instruments, such as the Posttraumatic Diagnostic Scale; and structured or semi-structured interviews, such as the Clinician-Administered PTSD Scale (CAPS), the Structured Clinical Interview for DSM-IV (SCID), the Diagnostic Interview Schedule for DSM-IV (DIS-IV), and the Composite International Diagnostic Interview (CIDI), Acute Stress Disorder Interview (ASDI),

Posttraumatic Stress Disorder Checklist(PCL), Acute Stress Disorder Scale (ASDS), Acute Stress Checklist for Children (ASC-Kids), Child PTSD Symptom Scale (CPSS) and Reactions to Research Participation Questionnaires for Children and Parents (RRPQ-C and RRPQ-P)[4,5,6]. All these might be used prior to or as a complement to the clinical interview. Such measures are used most frequently in research settings, some might be used clinically to provide additional sources of documentation, and others might be given to veterans at a health facility prior to their first interview with health professional. Screening tools can be useful in initiating a conversation about exposure to traumatic events or possible PTSD symptoms. However, as noted by Briere (2004) “no psychological test can replace the focused attention, visible empathy, and extensive clinical experience of a well-trained and seasoned trauma clinician [7].” Working in Vietnam war-zone, veterans have developed both psychometric and psycho physiologic assessment techniques that have proven to be both reliable and valid. Other investigators have modified such assessment instruments and used them with natural disaster victims, rape/incest survivors, and other traumatized cohorts.

PTSD has been criticized from the perspective of cross-cultural psychology and medical anthropology, because it has usually been diagnosed by clinicians from Western industrialized nations working with patients from a similar background. . Despite these criticisms, PTSD is a real time mental disorder with devastating clinical, physical, social and economic consequences for sufferers. Though clinicians from developing countries continue to diagnose PTSD using diagnostic systems developed in industrialized countries, the major clinical features appear to be uniform across cultures. Major gaps remain in our understanding of the effects of ethnicity and culture on the clinical phenomenology of post-traumatic syndromes. We have only just begun to apply vigorous ethno cultural research strategies to delineate possible differences between Western and non-Western societies regarding the psychological impact of traumatic exposure and the clinical manifestations of such exposure.

3. Epidemiology and prevalence

The United Nations' World Health Organization publishes estimates of PTSD impact for each of its member states; the latest data available are for 2004. The age-standardised-disability adjusted life-year (DALY) rates for PTSD, per 100,000 inhabitants, in 10 most ranking countries is as table 1.

The National Comorbidity Survey has estimated that the lifetime prevalence of PTSD among adult Americans is 7.8%, with women (10.4%) twice as likely as men (5%) to have PTSD at some point in their lives. In the United States, 60% of men and 50% of women experience a traumatic event during their lifetimes. The rate is highest for soldiers. The United States Department of Veterans Affairs estimates that 830,000 Vietnam War veterans suffered symptoms of PTSD. The National Vietnam Veterans' Readjustment Study (NVVRS) found 15.2% of male and 8.5% of female Vietnam Vets to suffer from PTSD. Life-Time prevalence of PTSD was 30.9% for males and 26.9% for females. For soldiers who fought in the Iraq war in 2008, the prevalence of PTSD was 13.8%. The National Survey of Adolescents, which included a household probability sample of 4,023 adolescents between the ages of 12 and 17, found that using accepted diagnostic criteria for PTSD, the six-month prevalence was estimated to be 3.7% for boys and 6.3% for girls [8].

Country	PTSD DALY rate, overall	PTSD DALY rate, females	PTSD DALY rate, males
Thailand	59	86	30
Indonesia	58	86	30
Philippines	58	86	30
USA	58	86	30
Bangladesh	57	85	29
Egypt	56	83	30
India	56	85	29
Iran	56	83	30
Pakistan	56	85	29
Japan	55	80	31

Table 1.

4. Classification

Posttraumatic stress disorder is classified as an anxiety disorder, characterized by aversive anxiety-related experiences, behaviors, and physiological responses that develop after exposure to a psychologically traumatic event (sometimes months after). Its features persist for longer than 30 days, which distinguishes it from the briefer acute stress disorder. These persisting posttraumatic stress symptoms cause significant disruptions in one or more important areas of life function. It has three sub-forms: acute, chronic, and delayed-onset; based on onset of symptoms after the traumatic event. Acute is of < 1 month, chronic between 1-3 months and delayed is after 3 months.

Complex Post Traumatic Stress Disorder (C-PTSD) is a condition that results from chronic or long-term exposure to emotional trauma over which a victim has little or no control and from which there is little or no hope of escape, such as in cases of domestic emotional, physical or sexual abuse; childhood emotional, physical or sexual abuse; entrapment or kidnapping; slavery or enforced labor and long term imprisonment and torture. When people have been trapped in a situation over which they had little or no control at the beginning, middle or end, they can carry an intense sense of dread even after that situation is removed. This is because they know how bad things can possibly be. And they know that it could possibly happen again. And they know that if it ever does happen again, it might be worse than before. C-PTSD results more from chronic repetitive stress from which there is little chance of escape. PTSD can result from single events, or short term exposure to extreme stress or trauma.

5. Etiology and risk factors

PTSD is believed to be caused by either physical trauma or psychological trauma, or more frequently a combination of both. Possible sources of trauma include experiencing or witnessing childhood or adult physical, emotional or sexual abuse. Other recognized causes

of PTSD include experiencing or witnessing an event perceived as life-threatening such as accidents, terminal illnesses, or employment in occupations exposed to war (such as soldiers) or disaster (such as emergency service workers). Traumatic events that may cause PTSD symptoms to develop include violent assault, kidnapping, sexual assault, torture, being a hostage, prisoner of war or concentration camp victim, experiencing a disaster, violent automobile accidents or getting a diagnosis of a life-threatening illness. Children or adults may develop PTSD symptoms by experiencing bullying or mob violence. Preliminary research suggests that child abuse may interact with mutations in a stress-related gene to increase the risk of PTSD in adults[9]. Multiple studies show that parental PTSD and other posttraumatic disturbances in parental psychological functioning can, despite a traumatized parent's best efforts, interfere with their response to their child as well as their child's response to trauma[10,11]. Parents with violence-related PTSD may, for example, inadvertently expose their children to developmentally inappropriate violent media due to their need to manage their own emotional dysregulation[12,13].

Military experience as risk factors for the development of PTSD include coming from an unstable family, being punished severely during childhood, childhood anti-social behavior and depression as pre-military factors, war-zone exposure, peri-traumatic dissociation, depression as military factors and recent stressful life events and depression as post-military factors[14]. Certain protective factors against PTSD in war-conditions include high school degree or college education, older age at entry to war, higher socioeconomic status, and positive paternal relationship as pre-military protective factors and social support at homecoming and current social support as post-military factors[15]. Research also indicates the protective effects of social support in averting and recovery from PTSD[16]. There may also be an attitudinal component; for example, a soldier who believes that they will not sustain injuries may be more likely to develop symptoms of PTSD than one who anticipates the possibility, should either be wounded[15]. Likewise, the later incidence of suicide among those injured in home fires above those injured in fires in the workplace suggests this possibility.

Posttraumatic stress responses have been documented in children who have suffered traumatic loss of their parents, siblings, and peers[17,18,19,20]. Results from a study indicated that knowing someone who was injured or killed, female gender, and bomb-related television viewing or other media exposure were associated with the most severe psychological reactions. Bereaved youths who suffered severe loss (e.g. a parent, sibling, close relative, or friend) as a result of the bombing were more likely to report posttraumatic stress symptoms than did children who did not experience this degree of loss.

Although most people (50-90%) encounter trauma over a lifetime, only about 8% develop full PTSD[21]. Vulnerability to PTSD presumably stems from an interaction of biological diathesis, early childhood developmental experiences, and trauma severity. Predictor models have consistently found that childhood trauma, chronic adversity, and familial stressors increase risk for PTSD as well as risk for biological markers of risk for PTSD after a traumatic event in adulthood[22]. This effect of childhood trauma, which is not well understood, may be a marker for both traumatic experiences and attachment problems. Proximity to, duration of, and severity of the trauma also make an impact; and interpersonal traumas cause more problems than impersonal ones[21]. People vary in susceptibility to PTSD. Genetic factors may play a significant role in susceptibility. Women develop PTSD at about twice the rate as men, even for the same crimes[21]. Individuals with a prior trauma history or multiple traumas are at increased risk[21]. A premorbid psychiatric history also

increases the likelihood of developing the disorder[22]. It may be that people who have fewer supports and limited inter-personal coping skills are more likely to develop PTSD[21]. Studies of concentration camp survivors and prisoners of war suggest that even given sufficient trauma intensity and duration most of those who are exposed develop PTSD.

A positive relationship has been found between trauma intensity and the likelihood of PTSD[22]. People who have been injured or perceived the event as life threatening are more likely to develop PTSD than those with less severe trauma. Human caused traumatic events such as assaults and murder have a more powerful impact than accidents and natural disasters. Among crime victims, individuals who have suffered more brutal trauma have higher frequencies of PTSD - torture (54%), rape (49%); badly beaten (32%), and other sexual assault (24%)[21]. Dissociation during the trauma, peritraumatic dissociation, is associated with risk for PTSD[21].

There is evidence that susceptibility to PTSD is hereditary. For twin pairs exposed to combat in Vietnam, having a monozygotic (identical) twin with PTSD was associated with an increased risk of the co-twin having PTSD compared to twins that were dizygotic (non-identical twins)[23]. Recently, it has been found that several single-nucleotide polymorphisms (SNPs) in FK506 binding protein 5 (FKBP5) interact with childhood trauma to predict severity of adult PTSD[24]. These findings suggest that individuals with these SNPs who are abused as children are more susceptible to PTSD as adults. Another recent study found a single SNP in a putative estrogen response element on ADCYAP1R1 (encodes pituitary adenylate cyclase-activating polypeptide type I receptor or PAC1) to predict PTSD diagnosis and symptoms in females[25].

6. Neurobiology

Neurobiological research indicates that PTSD may be associated with stable neurobiological alterations in both the central and autonomic nervous systems[26]. Psycho physiological alterations associated with PTSD include hyper arousal of the sympathetic nervous system, increased sensitivity and augmentation of the acoustic-startle eye blink reflex, a reducer pattern of auditory evoked cortical potentials, and sleep abnormalities. Neuropharmacologic and neuroendocrine abnormalities have been detected in the noradrenergic, hypothalamic-pituitary-adrenocortical, and endogenous opioid systems[27]. There is increasing evidence that PTSD is associated with biological alterations or abnormalities. Individuals with PTSD have an atypical stress response. Instead of producing increases in cortisol, a stress related hormone, the usual hypothalamic-pituitary axis mechanisms are disrupted and result in lower than expected levels of the hormone[28]. PTSD symptoms may result when a traumatic event causes an overactive adrenaline response, which creates deep neurological patterns in the brain. These patterns can persist long after the event that triggered the fear, making an individual hyper-responsive to future fearful situations. Brain catecholamine levels are low, and corticotropin-releasing factor (CRF) concentrations are high. Together, these findings suggest abnormality in the hypothalamic-pituitary-adrenal (HPA) axis. Trauma victims who develop post-traumatic stress disorder often have higher levels of other stimulating hormones (catecholamines) under normal conditions in which the threat of trauma is not present as well as lower levels of cortisol. This combination of higher than normal arousal levels and lower than normal levels of the "calming" hormones of the changes creates the conditions for PTSD. The amygdala is the brain region that alerts the body to danger and activates hormonal systems.

After a month in this heightened state with stress hormones elevated and cortisol levels lowered, further physical changes, such as heightened hearing develop. This cascade of physical changes, one triggering another, suggests that early intervention may be the key to heading off the effects of post-traumatic stress disorder.

Given the strong cortisol suppression to dexamethasone in PTSD, HPA axis abnormalities are likely predicated on strong negative feedback inhibition of cortisol, itself likely due to an increased sensitivity of glucocorticoid receptors. Some researchers have associated the response to stress in PTSD with long-term exposure to high levels of norepinephrine and low levels of cortisol, a pattern associated with improved learning in animals. Translating this reaction to human conditions gives a pathophysiological explanation for PTSD by a maladaptive learning pathway to fear response through a hypersensitive, hyperreactive and hyperresponsive HPA axis. Low cortisol levels may predispose individuals to PTSD: Swedish soldiers serving in Bosnia and Herzegovina with low pre-service salivary cortisol levels had a higher risk of reacting with PTSD symptoms, following war trauma, than soldiers with normal pre-service levels[29]. Because cortisol is normally important in restoring homeostasis after the stress response, it is thought that trauma survivors with low cortisol experience a poorly contained—that is, longer and more distressing—response, setting the stage for PTSD.

However, there is considerable controversy within the medical community regarding the neurobiology of PTSD. A review of existing studies on this subject showed no clear relationship between cortisol levels and PTSD. Only a slight majority have found a decrease in cortisol levels while others have found no effect or even an increase. Decreased brain volume or volume of specific brain structures have been documented in some adults and children with PTSD [30,31]. The biologic correlates have not yet been fully explored, nor are the implications for intervention established.

Three areas of the brain whose function may be altered in PTSD have been identified: the prefrontal cortex, amygdala and hippocampus. Much of this research has utilised PTSD victims from the Vietnam War. For example, a prospective study using the Vietnam Head Injury Study showed that damage to the prefrontal cortex may actually be protective against later development of PTSD [32]. In a study by Gurvits et al, combat veterans of the Vietnam War with PTSD showed a 20% reduction in the volume of their hippocampus compared with veterans who suffered no such symptoms [33,34]. This finding could not be replicated in chronic PTSD patients traumatized at an air show plane crash in 1988 (Ramstein, Germany) [35]. In human studies, the amygdala has been shown to be strongly involved in the formation of emotional memories, especially fear-related memories. Neuroimaging studies in humans have revealed both morphological and functional aspects of PTSD. The amygdalocentric model of PTSD proposes that it is associated with hyperarousal of the amygdala and insufficient top-down control by the medial prefrontal cortex and the hippocampus particularly during extinction. This is consistent with an interpretation of PTSD as a syndrome of deficient extinction ability. Further animal and clinical research into the amygdala and fear conditioning may suggest additional treatments for the condition.

7. Clinical features

Describing children's responses to trauma, Terr(1991) presents four specific symptoms characteristic of childhood PTSD: repeatedly perceiving memories of the event through visualization, engaging in behavioral re-enactments and repetitive play related to the event,

fears related to the trauma event, and pessimistic attitudes reflecting a sense of hopelessness about the future and life in general. The behavioral presentation of a child or adolescent experiencing PTSD or symptoms of PTSD may also include problems with verbalization and extremes of disconnections (no close relationships) or false connections (perceiving close relationships where none exist). Additionally, the diagnosis of PTSD cannot be made on the basis of the child's affective presentation alone (e.g. crying, sadness, or expressions of terror).

The symptoms of PTSD include:

- sleep problems including nightmares and waking early
- flashbacks and replays which you are unable to switch off
- impaired memory, forgetfulness
- inability to concentrate
- hyper vigilance (feels like but is not paranoia)
- exaggerated startle response
- irritability, sudden intense anger and occasional violent outbursts
- panic attacks
- hypersensitivity - almost every remark is perceived as critical
- obsessiveness - the experience takes over your life
- joint and muscle pains with no obvious cause
- feelings of nervousness and anxiety
- depression (reactive, not endogenous)
- excessive shame, embarrassment and guilt
- unnaturally high levels of fear
- low self-esteem, low self-confidence
- anhedonia, emotional numbness (inability to feel love or joy)
- detachment
- avoidance of anything that reminds you of the experience
- intense physiological reactivity and undue psychological distress at any reminder of the experience

Warning symptoms of PTSD: -

- Guilt about actions or shame over some failure
- Excessive drinking or drug use
- Uncontrolled or frequent crying and other extreme reactions to events that normally would be handled more calmly
- Sleep problems (too little, too much)
- Depression, anxiety, or anger
- Depending too much on others
- Verbal or physical family violence
- Stress-related physical illness (head and backache, intestinal problems, low energy)
- Inability to escape from horror scenes remembered from the war
- Difficulty concentrating
- Suicidal thoughts or plans

Diagnostic criteria: The diagnostic criteria for PTSD, stipulated in the Diagnostic and Statistical Manual of Mental Disorders IV (Text Revision) (DSM-IV-TR), may be summarized as [36,37]:

A: Exposure to a traumatic event

This must have involved both (a) loss of "physical integrity", or risk of serious injury or death, to self or others, and (b) an intense negative emotional response.

B: Persistent re-experiencing

One or more of these must be present in the victim: flashback memories, recurring distressing dreams, subjective re-experiencing of the traumatic event(s), or intense negative psychological or physiological response to any objective or subjective reminder of the traumatic event(s).

C: Persistent avoidance and emotional numbing

This involves a sufficient level of:

- avoidance of stimuli associated with the trauma, such as certain thoughts or feelings, or talking about the event(s);
- avoidance of behaviors, places, or people that might lead to distressing memories;
- inability to recall major parts of the trauma(s), or decreased involvement in significant life activities;
- decreased capacity (down to complete inability) to feel certain feelings;
- an expectation that one's future will be somehow constrained in ways not normal to other people.

D: Persistent symptoms of increased arousal not present before

These are all physiological response issues, such as difficulty falling or staying asleep, or problems with anger, concentration, or hypervigilance.

E: Duration of symptoms for more than 1 month

If all other criteria are present, but 30 days have not elapsed, the individual is diagnosed with 'acute stress disorder'.

F: Significant impairment

The symptoms reported must lead to "clinically significant distress or impairment" of major domains of life activity, such as social relations, occupational activities, or other "important areas of functioning".

In preparation for the May 2013 release of the DSM-5, the fifth version of the American Psychiatric Association's diagnostic manual, draft diagnostic criteria was released for public comment, followed by a two-year period of field testing. Proposed changes in DSM-5, to the criteria include:

- Criterion A (prior exposure to traumatic events) is more specifically stated, and evaluation of an individual's emotional response at the time (current criterion A2) is dropped.
- Several items in Criterion B (intrusion symptoms) are rewritten to add or augment certain distinctions now considered important.
- Special consideration is given to developmentally appropriate criteria for use with children and adolescents. This is especially evident in the restated Criterion B - intrusion symptoms. Development of age-specific criteria for diagnosis of PTSD is ongoing at this time.
- Criterion C (avoidance and numbing) has been split into "C" and "D":

- Criterion C (new version) now focuses solely on avoidance of behaviors or physical or temporal reminders of the traumatic experience(s). What were formerly two symptoms are now three, due to slight changes in descriptions.
- New Criterion D focuses on negative alterations in cognition and mood associated with the traumatic event(s), and contains two new symptoms, one expanded symptom, and four largely unchanged symptoms specified in the previous criteria.
- Criterion E (formerly "D"), which focuses on increased arousal and reactivity, contains one modestly revised, one entirely new, and four unchanged symptoms.
- Criterion F (formerly "E") still requires duration of symptoms to have been at least one month.
- Criterion G (formerly "F") stipulates symptom impact ("disturbance") in the same way as before.
- The "acute" vs. "delayed" distinction is dropped; the "delayed" specifier is considered appropriate if clinical symptom onset is no sooner than 6 months after the traumatic event(s).

PTSD is a clinical diagnosis; there are no laboratory tests or brain-imaging studies currently used in clinical practice to diagnose PTSD. Brain imaging studies are under way to learn more about the brain in the PTSD condition, but these are not used in everyday medical practice. A physical exam and some blood tests may be necessary to rule out medical conditions that may mimic PTSD, such as hyperthyroidism which can create an anxiety state.

8. Principles of management

There are various semi-structured diagnostic interviews schedules used in research, however, to date, there is no single instrument accepted as a "gold standard" for making the diagnosis of PTSD or monitoring symptoms.

8.1 Psychosocial treatment strategies

Four strategies have been distinguished by both empirical evaluation and the development of treatment manuals. Currently, only the cognitive-behavioral approaches have been investigated sufficiently to make empirically based recommendations. According to the State of Washington's Task Force on Promotion and Dissemination of Psychological procedures (1995), the four strategies that meet criteria for either "probably efficacious" or "well-established" are briefly described as follows [38,39,40]:

1. Prolonged Exposure (PE)

Prolonged Exposure is a standard technique that has been used with various anxiety disorders and has now been adapted for PTSD in rape victims (Foa & Rothbaum, 1998). PE involves repeated imaginal re-living of the traumatic experience. Then it is followed up with subsequent real life exposure to situations that are unpleasant reminders of the cause of the fear. The theory posits that repeated pairing of the emotional memories, with a non-dangerous environment will lead to reconditioning of the emotionally aversive associations to trauma memories [41]. Gradually being reminded or remembering the trauma will lose the intense negative quality. Breathing retraining to assist with relaxation is an initial component of the approach. The treatment ordinarily is carried out over ninety minute

sessions that may occur twice a week. High-risk concerns such as psychosis, homicidal or suicidal tendencies should be addressed.

2. Cognitive Processing Therapy (CPT)

Cognitive Processing Therapy is an approach that focuses primarily on trauma-related attributions and cognition that are maladaptive. There is exposure to the trauma, but it occurs in a modulated fashion and is accomplished through having victims write descriptions of the trauma that are repeatedly reviewed and read. The description is analyzed to identify blocks and dysfunctional cognitions and cognitive therapy techniques are used to challenge and replace these distortions with more appropriate, accurate and adaptive views. Themes of safety, trust, power, esteem and intimacy are specifically addressed. Coping skills are taught to assist victims in predicting and managing stress responses. CPT has been proven effective with female rape victims. Resick and Schnicke (1995) provide the theory underlying the approach and a detailed description of the various techniques. The treatment occurs over 12 sessions.

3. Stress Inoculation Training (SIT)

SIT is a CBT approach that has a primary focus on teaching the identification and management of anxiety reactions to stressful situations. Michenbaum (1985) first developed this intervention for use with a wide variety of populations suffering from anxious response including trauma. SIT involved explaining the physical, cognitive and behavioral components of fear and anxiety reactions. Then victims are taught various coping strategies to address dysfunctional thoughts and unpleasant feelings that come up with exposure to certain trauma reminders. These include relaxation, shifting attention and self-coaching dialogues. The goal is that victims learn to manage trauma related anxiety with confidence and efficacy. SIT has been found effective with various stress-related conditions and for female rape victims. Typically this approach consists of 8-14 sessions.

4. Eye Movement Desensitization and Reprocessing (EMDR)

Shapiro (1995) developed the Eye Movement Desensitization and Reprocessing (EMDR) approach. Like SIT, this approach has been advocated as a treatment for a variety of psychological problems involving intense emotions and intrusive thoughts. It is generally considered a form of imaginal exposure accompanied by cognitive re-framing, which are standard elements of CBT. Victims are encouraged to imagine a stressful scene and replace dysfunctional cognitions with more adaptive ones while engaging in lateral eye movements. Therapists move fingers back and forth to facilitate this process. The unique aspect of the treatment is the eye movement component. The currently available research has established EMDR is as effective as CBT treatments [42]. However, the eye movements have not been found to be necessary and they do not explain symptom reduction. Initially, it was claimed that EMDR could cure PTSD in one or two sessions. The developer of the method now takes the position that up to 12 sessions may be necessary in some cases to achieve full effects.

8.2 Pharmacotherapy of adult PTSD

Though seldom the sole, or even primary treatment for PTSD, pharmacotherapy can alleviate suffering, help restore immediate functioning, and be a supportive adjunct to psychotherapy [43,44]. The scientific literature on PTSD pharmacology is relatively sparse. Most studies have been trials of different medications, only a few randomized trials have been conducted and they have had equivocal results. Treatment guidelines are largely developed on the basis of clinical experience and expert opinion. Antidepressants are the

backbone of PTSD treatment; they are particularly useful for their anxiolytic qualities and ability to reduce arousal. The newer selective serotonin reuptake inhibitors and related medications are generally safer, better tolerated, and possibly more effective than older formulations. SSRIs (selective serotonin reuptake inhibitors) are considered to be a first-line drug treatment. SSRIs for which there are data to support use include: citalopram, escitalopram, fluoxetine, fluvoxamine, paroxetine and sertraline [45]. Atypical antidepressants like Nefazodone can be effective with sleep disturbance symptoms, and with secondary depression, anxiety, and sexual dysfunction symptoms. Trazodone can also reduce or eliminate problems with disturbed sleep, and with anger and anxiety. Heterocyclic/Tricyclic anti-depressants like Amitriptyline has shown benefit for positive distress symptoms, and for avoidance, and Imipramine has shown benefit for intrusive symptoms. Monoamine-oxidase inhibitors (MAOs) like Phenelzine has been observed to be effective with hyperarousal and depression, and is especially effective with nightmares.

A full psychopharmacologic approach can include the use of anticonvulsants and mood stabilizers, major tranquilizers and anti-psychotic medications of which newer drugs are well tolerated, and adrenaline blocking drugs [46]. Use of these combinations is usually best left to psychiatrists who are expert in the treatment of PTSD.

Beta blockers (Propranolol) has demonstrated possibilities in reducing hyperarousal symptoms, including sleep disturbances [47]. Also, post-stress high dose corticosterone administration was recently found to reduce 'PTSD-like' behaviors in a rat model of PTSD[48]. In this study, corticosterone impaired memory performance, suggesting that it may reduce risk for PTSD by interfering with consolidation of traumatic memories. Clinical trials evaluating methylenedioxymethamphetamine (MDMA, "Ecstasy") in conjunction with psychotherapy are being conducted in Switzerland and Israel.

Symptom prevention:- Some medications have shown benefit in preventing PTSD or reducing its incidence, when given in close proximity to a traumatic event. These medications include: Alpha-adrenergic antagonists (e.g. clonidine), Beta blockers (e.g. Propranolol), Glucocorticoids and Opiates [49].

8.3 General treatment components in children

When clinicians offer assistance to traumatized children and their families, they should begin with: (1) Establishing rapport with the child and caregiver(s) and (2) Providing a rationale for treatment. The clinician should keep the following points in mind when providing a rationale for treatment. The child and caregiver(s) should separately or together receive information regarding the purpose and process of treatment. Caregivers should be informed about the common effects of traumatic experiences on children; that children can have a variety of different reactions. Most children do not have lasting psychological effects (although with some experiences long term effects are more likely, e.g., abuse by the parent, long-term abuse). Treatment will most often be relatively short term and will involve talking about what happened, learning to express feelings appropriately, and gaining an accurate perception of the event. The treatment rationale and concrete goals of therapy should be presented to the child in a clear and simple manner. In the case of certain crimes, such as sexual abuse or physical abuse, where there may be misinformation about children's roles in what happened or offender patterns, it is important to provide corrective information. Educating caregivers and their children about healthy sexuality and personal safety skills is also important during the initial phase of treatment with victims of sexual abuse.

Empirical evidence from controlled treatment-outcome studies provides strongest support for the use of trauma-focused cognitive-behavioral treatment (CBT) to resolve PTSD symptoms in children[42]. Therefore, CBT may be considered as the first line approach, either alone or in conjunction with other forms of therapy. CBT usually involves the following components: direct discussion of the trauma, emotional and cognitive coping skills, corrective cognitive distortions, and contingency reinforcement programs for children displaying behavioral problems. The current consensus is that it is not necessary that children be diagnosed with PTSD to receive this treatment, only that they have identifiable posttraumatic stress symptoms that interfere with functioning. CBT approaches are based on the interrelationships between thoughts, feelings, and behaviors [50,51]. In many cases thoughts can lead to emotional states which in turn produce behavioral responses. For example, traumatized children may have over generalized or inaccurate beliefs derived from the traumatic stress experience that triggers anxiety responses. Anxiety is expressed as intensely uncomfortable or may be expressed in appropriate behaviors. In addition, avoidance coping may temporarily reduce anxiety but lead to maladaptive behavior patterns.

8.3.1 Teaching stress management techniques

Stress management techniques such as progressive muscle relaxation, thought-stopping, positive imagery, and controlled breathing are often taught to accompany direct trauma-focused discussion in treatment. It is usually recommended that these skills be taught to children prior to detailed discussions of the trauma. With practice, relaxation strategies can help the child gain confidence to approach the direct discussion of the trauma without overwhelming fear, as well as handle other stressful situations outside of the therapeutic context (i.e. flashbacks at school). Because stress management is a useful skill and is easy to master, this component of treatment can facilitate a more positive association to therapy to counterbalance some of the more difficult aspects.

1. Relaxation techniques

Systematic relaxation consists of a series of muscle tensing and relaxation exercises. progressive relaxation and guided tension releasing exercises are recommended for children above 10 years. Therapists may want to adapt exercises to the child's most problematic muscle groups or focus on head, torso and leg exercises separately. Image-induced relaxation is a strategy that may be more effective for younger children. They are taught to distinguish between tense and relaxed states. For example, a child is asked to stand like a "tin soldier" and conversely collapse like a "wet noodle" into a chair. Children are taught when confronted by distressing memories or cues to practice relaxed responding. Children are taught self-instruction such as "relax, hang loose, lighten up, or calm down" at these times and are encouraged to practice at home. Controlled/deep breathing consists of gradually breathing in and out on a count of four to restore normal breathing states and promote relaxation. This technique can be used in vivo for all types of stress inducing situations.

2. Cognitive coping techniques

Thought replacement consists of teaching children to interrupt upsetting or disturbing thoughts (e.g., imagines a stop sign and sub-vocalizes the word STOP), and focus on a positive experience or memory (e.g., getting hugged by a parent, going to Disneyland). Positive coping self-statements challenge the disturbing thoughts with self affirming or

reassuring thoughts (e.g., I am strong, I can handle this situation, I am not really in danger now).

8.3.2 Direct exploration/discussion of the traumatic experience

There is a strong clinical consensus that addressing the traumatic experience, regardless of the specific methodology, is the core ingredient of effective treatment for PTSD in children. Exposure to the traumatic memories and feared reminders under safe circumstances serves to decondition these associations and reduce the use of avoidance coping. Safety does not just mean that the child has developed trust in the therapy environment. Most important is that the child is in a safe and supportive living situation. It is inappropriate and possibly dangerous to encourage children to engage in trauma-focused therapy when they are still at risk.

1. Exposure techniques

For children, gradual exposure techniques are recommended. These techniques gradually expose a child to thoughts, memories and other cues or reminders of the traumatic experience. When children can tolerate the memories without significant emotional distress they are less likely to resort to avoidant behaviors. The goal is that when children face trauma-related memories or cues, more adaptive responses like feelings of control, mastery, pride and courage will gradually replace fearful/anxious responses. There are a variety of different exposure techniques used to elicit children's participation and provide them with a sense of control. It is important, regardless of the exposure technique used, that a therapist clearly presents to the child the rationale behind exposure. No matter how well a therapist prefaces the exposure procedure, resistance by children may be an initial reaction to this therapeutic approach because significant emotional and physical discomfort may be experienced. For this reason it is important to inform caregivers and children that some increased symptoms are common responses at first. In order to attain relief in the long run, some level of anxiety or distress may need to be endured while confronting fears. Preparing caregivers for children's possible negative reactions to therapy will increase cooperation and compliance.

Gradual exposure techniques are primarily designed to be useful when post-traumatic stress symptoms are present. Children who do not exhibit fear or anxiety may not need extensive focus on the traumatic experience itself. Emotions such as embarrassment, shame, or sadness associated with recalling the event may be reasonable reactions or may be better addressed through a focus on attributions and perceptions about the event. A child's symptoms may worsen if a therapist insists upon constantly talking about the traumatic memories or events. There is currently no evidence that talking about the details of what happened is necessary to recovery in children.

In sum, a child's capacity to talk about the trauma without experiencing significant distress or use of avoidance coping is an indication of successful emotional processing. However, a child's unwillingness to talk about it may not be because of post-traumatic stress reaction but instead a legitimate response(e.g., tired of talking about it, embarrassed). In these situations, various indirect methods of addressing trauma-related issues like art, book making and play techniques may be more useful. Mediums such as clay or PLAY-DOH can also facilitate children in depicting different aspects of the traumatic event.

2. Strategies for gradual exposure

The process of gradual exposure begins by confronting the least anxiety provoking stimuli first and works its way through more distressing stimuli (e.g. the child might identify hearing the word “rape” as upsetting, but less so than remembering what actually happened). Talking, writing, speaking into a tape-recorder, responding to “mock interview,” or drawing a picture with explanation can be used to accomplish exposure. Role-playing, puppet play, and doll-play can be helpful especially with young children. Some children may choose to create books, poems or songs about their traumatic experiences.

Direct Exposure: This method is appropriate for an older child with good visualization skills. The child is asked to recall specific sensory details of traumatic event, focusing on visual memories. Fantasy is discouraged when recalling the account. This approach should not be confused with hypnotic suggestion or guided imagery. For example, a therapist asks the child to close her eyes (if comfortable) and recall a scene of the traumatic event as if she were there. The therapist poses some specific questions to help the child stay focused like, “describe the room you were in, the time of day, or what the child smells, hears, feels, and thinks at the time.” Too many questions may interfere with the child’s visualization. The therapist should only ask as many questions as they feel necessary to help the child visualize the scene. The session should not end until the child’s anxiety level has decreased or coping techniques have been used to help the child regain a sense of calmness.

In Vivo Exposure: this technique is most used in the later stages of the exposure therapy. The child is helped to identify situations for in vivo practice of exposure to fear inducing stimuli. This should occur in a situation where there is no actual danger or risk thus enabling the child to experience mastery and competence (e.g., confronting fear of the dark by turning off the light during the session, sleeping alone in her room, walking to school).

8.3.3 Exploring and correcting inaccurate attributions

Most interventions for traumatized children also involve the evaluation of cognitive assumptions children may have made relating the traumatic experience. Children make sense of their experiences in the world by developing belief systems. Like adults, most children have a generally positive view of themselves, other people and the world. Being the victim of a traumatic stress situation can conflict with those beliefs. In order to resolve the conflict, children may change their ideas and thoughts about themselves and others or develop inaccurate, distorted and confused beliefs about the trauma[]. Examples of faulty attributions are “Nothing is safe anymore”, “It was all my fault”, “I must be a bad person for this to have happened.” For some children, unfortunately, a traumatic event can serve to confirm already existing negative perceptions. When treating children with PTSD, it is important to explore and correct these distorted thought patterns related to the trauma. The maladaptive assumptions or beliefs must first be identified. This means it is important initially to allow children to express beliefs even though they may be inaccurate (e.g. self blame-“I asked for it because I went to his house” – or thinking that drinking caused the offender to abuse). Then through various therapeutic exercises, like role playing, telling stories, and providing corrective feedback, these negative or inaccurate thoughts can be disputed. The therapist helps the child generate positive thoughts to replace negative distorted ones instead of just telling children what they should think. With younger children, play therapy using toys and dolls, art materials, and games may be a more effective approach to explore their inaccurate attributions.

1. Strategies for correcting cognitive distortions

Cognitive coping triangle: The therapist facilitates discussion with the child about the interrelationship among thoughts, feelings, and behavior starting with a general discussion and moving toward trauma-specific examples. Using examples from every-day life is a useful way of conveying these connections and then relating them to post-traumatic symptoms. For example, the child is presented with a negative and a positive scenario involving peers. For each situation, the child is asked what his/her thoughts, feelings and behaviors would be. The child practices identifying the emotions generated by different thoughts and then identifying thoughts underlying emotions. The therapist helps the child work through examples modeling the process and pointing out how different thoughts about the same situation can result in very different feelings and behaviors. This process may be difficult. Visual aids like pencil and paper, a chalkboard, or a dry-erase board are used to help work through fictitious examples until the child understands the problem triangle concept.

Disputing negative/unproductive-thoughts: The therapist explains that changing distressing thoughts and emotions is a skill that can be gradually acquired through practice. The therapist stresses that negative thoughts are not necessarily valid or permanent. The therapist presents fictitious examples through storytelling in which the child practices substituting positive replacement thoughts for negative unhealthy ones. For example, the therapist may use the "Best Friend Role Play" in which the child role plays with the therapist, (or puppet, empty chair, etc.) imagining that their best friend is having negative thoughts and their job is to convince the best friend that these thoughts are NOT true. It is important to distinguish between the personal thoughts and feelings of the therapist and the role that they are playing during these exercises. For younger children, the use of a puppet reinforces the idea that they are engaged in a game and distinguishes the character's beliefs in the role-play from the therapist's beliefs.

Generating positive self statements: The therapist teaches the child a series of positive self-statements that can replace negative dysfunctional thoughts. Children's self-statements are made to fit their individual difficulties. For example, a child with low self esteem and poor self-image may be encouraged to say, "I am just as good as other kids" or generate reasons why they are special. A withdrawn and/or fearful child may be taught to say, "It's fun trying new things or I am very brave sometimes."

2. Pharmacotherapy

Preliminary studies have shown that some children with PTSD present with physiologic abnormalities much like those seen in adults with PTSD. Even though randomized trials have not yet been conducted, preliminary reports have prompted clinicians to use a variety of medication with children suffering from PTSD symptoms and associated symptoms of depression or panic. The psychopharmacological agents that have been recommended include propranolol, carbamazepine, clonidine, and antidepressants. Most often these medications are not considered the primary intervention but prescribed in conjunction with psychotherapy. Research on psychopharmacological treatments for children with PTSD have revealed that certain psychotropic medications have significantly reduced reexperiencing symptoms like nightmares and other PTSD related symptoms in uncontrolled clinical trials[1]. As a general practice, "medication should be selected on the basis of established practice in treating the co-morbid condition (e.g., antidepressants for children with prominent depressive symptoms)". Due to their favorable side effect profile

and effectiveness in treating both depressive and anxiety disorders, serotonin reuptake inhibitors (SSRIs) are often the first psychotropic medications selected for treating pediatric PTSD. Imipramine also is often chosen to treat children suffering from co-morbid panic symptoms.

Helping Children Cope With Trauma

After any disaster, children are most afraid that the event will recur, that they or someone they love will be hurt or killed, and that they may be separated from those they love and will be left alone. Suggested strategies for helping children cope with trauma include the following[]:

- Children younger than 6 years of age should not be exposed to TV videotape coverage of the attacks (or any television coverage of war or prolonged violence), and the viewing time allowed for older children should be limited.
- Encourage children to express their feelings about what has happened. Parents should share their feelings with them. Regressive behaviors (e.g., thumb sucking, night awakenings, and bed-wetting) may occur in response to traumatic events. Parents should know not to punish or scold their child for these types of behaviors, but instead to try to help the child put their feelings into words.
- Children need to be frequently reassured that they are safe and that they are loved.
- Parents should be encouraged to be honest with their children about what has occurred and to provide facts about what has happened. Children usually know when something is being “sugar-coated.”
- Encourage parents to try to return the child and the family to a normal routine as soon as possible. This will help provide a sense of security and safety.
- Encourage parents to spend extra time with the child, especially doing something fun or relaxing for both of them.
- Remember the importance of touch. A hug can reassure children that they are loved.
- Each family should review safety procedures so children will be prepared the next time an emergency situation occurs.
- Encourage parents to talk with teachers, baby-sitters, and day care providers and others who may be with the child so that they will understand how the child has been affected.
- Watch for signs of repetitive play in which children re-enact all or part of the disaster. Although excessive reenactment of a traumatic experience may be a warning sign, this behavior is an appropriate form of expression of emotions.
- Encourage children who are not able to articulate their feelings to express themselves through coloring, drawing, and painting.
- Remind parents to praise and recognize responsible behavior and reassure children that their feelings are normal in response to an abnormal situation.

9. Conclusion

Events that are threatening to life or bodily integrity will produce traumatic stress in its victim. This is a normal, adaptive response of the mind and body to protect the individual by preparing him to respond to the threat by fighting or fleeing. If the fight or flight is successful, the traumatic stress will usually be released or dissipated allowing the victim to return to a normal level of functioning. PTSD develops: when fight or flight is not possible;

the threat persists over a long period of time; and/or the threat is so extreme that the instinctive response of the victim is to freeze. There is a mistaken assumption that anyone experiencing a traumatic event will have PTSD. This is far from true. Studies vary, but confirm that only a fraction of those facing trauma will develop PTSD (Elliott 1997, Kulka et al 1990, Breslau et al 1991). What distinguishes those who do not is still a hot topic of discussion, but there are many clues. Factors mediating traumatic stress appear to include: preparation for expected stress (when possible), successful fight or flight responses, prior experience, internal resources, support from family, community, and social networks, debriefing, emotional release, and psychotherapy.

Severe trauma during childhood can have a devastating effect on the development of the brain and all functions mediated by this complex organ - emotional, cognitive, behavioural and physiological. Intense emotional reactions in the face of these events are expected and normal, and the range of feelings experienced may be quite broad. Every conflict forces one to live through some terrible experiences. Indeed, millions of people have been present at events far beyond the worst nightmares. Trauma researchers believe that it is the repression of memories and feelings that is at the heart of trauma suffering in both the short and long term. Time does not heal trauma. Every culture has its own way of dealing with traumatic experiences. And much also depends on the family circumstances, as well as on their age and the nature of their exposure to traumatic events. In all cultures, one of the most important factors is the cohesion of the family and community, and the degree of nurture and support that one receives through events in which they had defied death.

Identification of a portion of those suffering from PTSD will be straightforward. But others may be difficult to spot owing to complicated life or defensive systems. Evaluation of the state of the autonomic nervous system will assist in the diagnosis of PTSD and in setting treatment objectives where appropriate. Preexisting negative appraisals, impaired retrieval of autobiographical memories, and decrements in verbal memory may represent trait-like cognitive phenomena that denote greater vulnerability to PTSD following trauma and predict symptom course. These areas of research have tremendous potential for contributing to prevention and treatment of PTSD, as would additional research examining relationships between cognitive phenomena that may shed light on underlying mechanisms. In addition, future research delineating cognitive difficulties in PTSD in the absence of comorbid depression would further elucidate factors contributing to and resulting from different posttraumatic sequelae. Regarding cognitive phenomena specific to trauma memories, current research examining PTSD-related intrusions provides further evidence that they are not qualitatively distinct from other intrusive cognitions.

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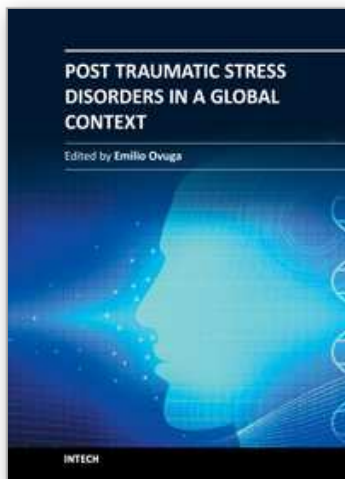
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Post Traumatic Stress Disorders in a Global Context

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If, as a health care or social service provider, one was called upon to help someone who has experienced terror in the hands of a hostage taker, an irate and chronically abusive spouse or parent, or a has survived a motor vehicle accident, landslide, earthquake, hurricane or even a massive flood, what would be one's priority response? What would be considered as the most pressing need of the individual requiring care? Whatever the answer to each of these questions, people who have experienced terror, suffer considerable psychological injury. Post-Traumatic Stress Disorder in a Global Context offers some answers to meet the needs of health care and social service providers in all settings, whether in a hospital emergency room, at the war front, or natural disaster site. The take home message is, after providing emergency care, there is always a pressing need to provide mental health care to all victims of traumatic stress.

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