REVIEW ARTICLE

Post-Traumatic Stress Disorder— a Diagnostic and Therapeutic Challenge

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SUMMARY

Background: In Germany, the one-month prevalence of post-traumatic stress disorder (PTSD) is in the range of 1% to 3%. Soldiers, persons injured in accidents, and victims of domestic violence increasingly seek medical help for symptoms of emotional stress. Days lost from work and monetary compensation for emotional disturbances are markedly on the rise. The term “PTSD” is commonly used uncritically and imprecisely, with too little regard for the existing diagnostic criteria. It is at risk of turning into a nonspecific collective term for emotional stress of any kind.

Methods: We selectively reviewed the literature in the PubMed database and pertinent journals, with additional consideration of the recommendations and guidelines of medical societies from Germany and abroad.

Results: The characteristic types of reactions seen in PTSD are nightmares and an intense, repetitive, intrusive “reliving” of the traumatic event(s). Emotional traumatization manifests itself not only as PTSD but also through major effects on other mental and somatic diseases. An early, trauma-focused behavioral therapeutic intervention involving several sessions, generally on an outpatient basis, can prevent the development of PTSD. The most important components of effective treatment are a focus on the particular trauma experienced and confrontation with the patient’s memories of the trauma. The best existing evidence is for cognitive therapy, behavioral therapy according to the exposure paradigm of Foa, and eye movement desensitization and reprocessing therapy. The most recent meta-analysis reveals effect strengths of $g = 1.14$ for all types of psychotherapy and $g = 0.42$ for all types of pharmacotherapy taken together (with considerable differences among psychotherapeutic methods and among drugs). The efficacy of psychodynamic therapy, systemic therapy, body-oriented therapy, and hypnotherapy has not been adequately documented in randomized controlled trials.

Conclusion: PTSD can be precisely diagnosed and effectively treated when the diagnostic criteria and guideline recommendations are taken into account. Referral for trauma-focused psychotherapy should be considered if the acute symptoms persist for several weeks.

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Stressful experiences are an ordinary part of life. In the 19th century doctors began systematic research into the psychological consequences of a range of stressful events such as accidents and sexual abuse. The scope of the term “trauma,” which initially referred to physical injuries, was extended to include psychological effects.

Nowadays, post-traumatic stress disorder (PTSD) is sometimes diagnosed uncritically and too frequently (1). PTSD is by no means the only disorder resulting from trauma, and chronic cases of PTSD are often accompanied by other physical and psychological illnesses or concealed by other, identifiable disorders. This can make differential diagnosis very difficult.

This article provides a critical discussion of the use of the term “trauma” and describes the clinical manifestations, common comorbidities, and long-term effects of PTSD. It also covers the treatment options for medical practice and hospitals. For reasons of space, the subject matter is broadly restricted to PTSD (for a more detailed overview see [2]).

Epidemiology, progression, and long-term consequences

The essential prerequisite for a trauma-related disorder such as PTSD is a specific, unusually stressful external event. When asked as part of the world’s largest epidemiological study (3), 60% of members of a representative sample of the US population reported having experienced at least one traumatic event as defined by the established criteria for trauma. However, only a small proportion of these (8% of men, 20% of women) subsequently developed PTSD. This indicates that other factors can influence whether or not PTSD develops.

The risk of PTSD is higher if trauma is inflicted deliberately. More than 90% of rape victims develop an acute stress disorder, and around 50% develop PTSD (4). Lower PTSD rates are found among victims of chance events such as natural catastrophes and accidents (3). High-risk populations, such as soldiers, also have an increased risk of PTSD, varying with the location and type of service (e1). PTSD figures rise to more than 20% among US soldiers in Afghanistan and Iraq (5). In Germany, the one-month PTSD prevalence rate in the population as a whole is between 1% and 3%, increasing with age (6) (*Box 1*).

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BOX 1

Overview of post-traumatic stress disorder (PTSD)

- **One-month prevalence rate (in Germany)**
 - 1.3% to 1.9% (in those aged under 60 years)
 - 3.4% in those aged over 60 years
- **Sex ratio**
 - 2 to 3:1 (women:men); with the exception of sexual trauma, men experience traumatic events more frequently than women
- **Distribution by type of event**
 - Type I trauma: short-term (e.g. accident)
 - Type II trauma: persistent, repeat traumatization (e.g. domestic or sexual violence)
- **Comorbidities**
 - a) Psychological disorders:
Affective disorder, anxiety disorder, somatization disorder, borderline personality disorder, dependency, psychosis, dissociative identity disorder
 - b) Physical disorders:
Following accidents; pain syndromes, cardiovascular, pulmonary, and rheumatic diseases
 - c) Increased mortality
- **Progression**
 - Severe initial symptoms possible
 - Symptoms often decrease or remit within a few days to weeks
 - PTSD becomes chronic in approximately 20% to 30% of patients

Many studies show that traumatic events also play a role in serious psychological illnesses such as depression (e2), bipolar disorder (7), psychosis (e3, e4), anxiety disorders (e2), and alcoholism (8). Concomitant PTSD has an adverse effect on the severity and progression of these illnesses (7–9, e5). A high number of traumatic events and psychosocial stresses during childhood and adolescence leads not only to a higher rate of psychological and physical illnesses (e6) but also to lower life expectancy (by up to 20 years) (10). Large studies have found associations between traumatic events and multiple physical illnesses, such as chronic obstructive pulmonary disease (COPD), rheumatic diseases, cardiovascular diseases, and cancers (11, e6, e7). The processes underlying these associations have not yet been clarified. It is possible that a chronically increased level of stress, with its multiple biological consequences, plays a major role (12, 13, e8).

Research data shows that individuals who are injured in accidents and have psychological trauma-related disorders experience longer hospital stays, more frequent complications, and delayed recovery (14). Society bears a heavy cost for trauma-related disorders in the form of increased rates of interrupted education and training, unwanted pregnancy, partnership conflicts, and unemployment. In the USA, the productivity

losses caused by PTSD alone are estimated at more than US\$ 3 billion/year (15). For Germany, the total financial impact of all aspects of trauma-related disorders is estimated at €11 billion/year (16).

Symptoms

Typical reactions are an intense, unavoidable reliving of the traumatic event in the form of images, film-like scenes, or nightmares. The affected individual is unable to control his or her memories. The attempt not to think about the trauma again fails and leads to dysfunctional avoidance behavior. This causes symptoms to become prolonged and chronic.

PTSD symptoms can also include dissociative symptoms (e.g. total or partial amnesia) and emotional numbing. Manifestations of physical and psychological unease, such as nervousness and sleep and concentration disorders, occur as if the threat that occurred in the past still continued to exist. Exaggerated startle response, tension, outbursts of anger, and irritability are also possible. Depending on the type of trauma, individuals can experience deep despair and be tortured by feelings of shame and guilt; this is sometimes associated with self-harm. Distorted thinking can effect a lasting change in the individual's perception of the world ("There's danger lurking everywhere"), others ("I can't trust anyone"), and him/herself ("I'll never get over it") (Box 2).

The term "trauma" and diagnosis

In ordinary speech, and even among physicians and psychotherapists, the word "trauma" is used to denote an extremely wide variety of events. In everyday medical practice a diagnosis of PTSD as a synonym for stress reactions of any kind is as common as it is incorrect. The term "trauma" for the diagnosis of PTSD, however, is strictly defined in psychiatric classification systems. It includes only exceptional, life-threatening or potentially life-threatening external events and those associated with serious injury, which are capable of causing a psychological shock in practically any individual to a greater or lesser extent.

The psychological consequences of less serious, non-life-threatening stresses such as a divorce, job loss, bullying, or bitter feelings about these are to be considered adjustment disorders, even if individual symptoms typical of PTSD occur. Too little account is taken of the fact that diagnosis has not only criteria relating to trauma, symptoms, time, and clinical significance but also therapeutic consequences. Incorrect diagnoses can lead to incorrect treatment or mistaken expert judgments.

Problems are caused by diagnosis being applied too broadly, together with overprotective behavior on the part of the physician and excessively long sick leave, without appropriate treatment. This can also lead to an unrealistic desire for treatment, including regressive behavior and self-identification as a victim.

One cause of incorrect evaluations is that the severity of an event is not necessarily correlated with

the severity of the resulting symptoms. Different people can react to the same event in very different ways. This makes the effect of other risk and protective factors important. Such factors include genetics and epigenetics, intelligence, sex, coping strategies and defense mechanisms, and social support, as well as social expectations and potentially a desire for compensation (17, 18, e9, e10).

Confronting the traumatic events reported by the patient can trigger intense emotional reactions in the physician; these can range from overprotective behavior to brusque disapproval. This must be acknowledged and reflected upon, as it can otherwise place great strain on the therapeutic relationship and is unhelpful.

In the context of the increasing number of expert sociomedical appraisals of trauma-related disorders and their effects, difficult judgments are sometimes required of the experts in question (19, e11, e12).

Criticism of PTSD as a concept concerns the term “trauma,” the significance of the many factors that influence whether or not clinical manifestations develop, and issues of validity (e13). The definition of PTSD is currently being reviewed for the new editions of the DSM and ICD diagnostic classifications (DSM-5 and ICD-11) (20, 21, e14). A separate category for stress-related disorders has been created in DSM-5, as was already the case in the ICD (22). Constellations of symptoms classified as “complex” PTSD (23) following prolonged traumatic events may be added to ICD-11. This would close a much-criticized loophole in the definition of PTSD, as the traditional criteria for PTSD do not reflect the variety of symptoms of “complex” PTSD. DSM-5 allows for this in a rudimentary way by expanding the criteria for PTSD (21).

Differential diagnosis

Different people react to trauma in different ways, so a number of disorders may develop. In addition to trauma-related disorders in the narrow sense (PTSD, complex PTSD, lasting personality change following extreme stress, dissociative identity disorder), anxiety disorders, depression, or addiction can occur in isolation (15, 24).

Patients with psychological disorders are often also traumatized, but to a varying degree. Traumatization is very frequently (50% to 70% of cases) found in borderline personality disorder, but it is also found more commonly than previously thought in other psychological disorders, such as anxiety disorders, unipolar depression and bipolar affective disorders, schizophrenia, and addictions (7, 8, e2–e4). Not everyone who experiences a traumatic event develops a disorder (3, 15, 24).

Problems occur when, for example, PTSD patients turn to sedatives to reduce their agitation, with the potential consequences of substance abuse (8). Studies show that the rate of PTSD among those with serious psychological disorders is significantly higher (7, 8, e15) than stated in medical records. At least one psychological comorbidity has been found in more than

BOX 2

Post-traumatic stress disorder (PTSD) diagnosis (DSM-IV)

- **A: Trauma**
Objective: life-threatening;
Subjective: intense fear, helplessness, horror
- **B: Reliving**
Nightmares, intrusions, flashbacks, psychological stress, physical reactions to confrontations
- **C: Avoidance behavior**
Emotional numbing, alienation, incomplete recollection, avoidance of trauma-associated stimuli
- **D: Hypervigilance**
Sleep and concentration disorders, Exaggerated startle response, irritability
- **E: Duration >1 month**
- **F: Psychosocial impairment**
- **Differential diagnosis**
 - PTSD symptoms are associated with the traumatic event and can be triggered by recollections/reminders
 - Acute stress reaction: symptoms last less than 1 month (DSM criterion)
 - Adjustment disorders: less severe trauma/stress; symptoms usually less severe, or not all symptoms present
 - Complex PTSD (following type II trauma): more wide-ranging, far-reaching symptoms such as lasting mistrust; affective dysregulation; disorders affecting relationships, intimacy and sexuality, identity, and self-perception; chronic suicidal thoughts; self-harm

70% of all chronic PTSD patients during their PTSD (3, 15, e16). This makes it important that physicians consider possible traumatic events and ask targeted questions to learn about them in medical practice.

Causes

Freud wrote of a “breach in the protective shield against stimuli” (e17), in other words an excess of information that must be psychologically dealt with as a result of a severe trauma. The event exceeds the capacity of psychological resources and existing coping strategies. The development of PTSD must always be understood as an interaction between disposing factors, characteristics of the event that has occurred, and protective factors.

Studies show that a lower hippocampus volume and genetic polymorphisms of receptors or neurotransmitter transporters modulate reactions (12, 17, 25, 26, e9). Hypoactivity in the prefrontal cortex and

BOX 3

Main types of psychotherapy for post-traumatic stress disorder

- **Early intervention:**
Conflicting results, probably trauma-focused cognitive behavioral therapy lasting several hours (30, e22, e23)
- **Best evidence psychotherapeutic approaches (evaluated in randomized controlled trials [RCTs]):**
 - Trauma-focused cognitive behavioral therapy (CBT): $d = 1.26$ to 1.53 (meta-analysis according to [35])
 - Eye movement desensitization and reprocessing (EMDR): $d = 1.25$ (meta-analysis according to [35])
- **Other promising treatments (evaluated in RCTs):**
 - Imagery rescripting and reprocessing therapy (IRRT), in combination with other methods only: high effect sizes
 - Narrative exposure therapy (NET): $d = 0.65$ (meta-analysis according to [e28])
 - Brief eclectic psychotherapy (BEP): $d = 1.55$ (according to [e27])

corresponding hyperactivity in the amygdala indicate emotional dysregulation and therefore a functional imbalance between the systems (27). Neurobiologically, a traumatic event leads not only to functional changes but even to morphological ones (28). Epigenetic changes can occur as result of trauma and can continue to have an effect even on subsequent generations (17, 26).

Early intervention

The family doctor is often the first person someone talks with about a trauma. Initially, simple, sympathetic, but sometimes “forgotten” attitudes and principles should be adopted in such situations. Severe traumatic events are existential borderline experiences that can cause massive confusion. Sympathy, support that provides safety, and reassurance are therefore essential. Active listening, letting the patient describe his/her experience in detail, and inquiry are necessary. This encourages the support urgently needed by the patient to preserve (or recover) his/her self-esteem. Critical, skeptical questions and comments that belittle the patient and do not take him/her seriously are inappropriate. The primary role of the physician is to provide help, not critical inquiry.

Very in-depth exploration should be avoided at the first meeting, as trigger stimuli can be very stressful. The patient should also be informed of this when his/her urge to communicate is strong.

Mentioning possible symptoms resulting from what has occurred, categorizing them, and describing them as “normal reactions to an abnormal event” can improve understanding of reactions and reduce anxiety. It is important on the one hand not to pathologize

BOX 4

Psychiatric pharmacotherapy for post-traumatic stress disorder (PTSD)

- **Early intervention:**
 - Effectiveness not guaranteed;
 - to be avoided: benzodiazepines
- **Complete clinical picture of PTSD*:**
 - Tricyclic antidepressants (TCAs): amitriptyline, imipramine
 - Monoaminoxidase (MAO) inhibitors: phenelzine, moclobemide
 - Selective serotonin reuptake inhibitors (SSRIs): paroxetine, sertraline, fluoxetine
 - Selective serotonin and noradrenalin reuptake inhibitors (SNRIs): venlafaxine
 - Noradrenergic and specific serotonergic antidepressants (NASSAs): mirtazapine
 - Mood stabilizers: carbamazepine, lamotrigine
 - Authorized for the indication PTSD in Germany: paroxetine (paroxetine and sertraline in the USA)
 - Cochrane Review (e31): SSRIs are first-line drugs
 - Review of meta-analyses and guidelines (39): SSRIs and SNRIs (venlafaxine) are first-line drugs

*Meta-analysis of randomized controlled trials (RCTs) (39, e31): weighted mean difference (WMD) = -5.95 for selective serotonin reuptake inhibitors

reactions and on the other hand to attribute psychological symptoms that are causing concern primarily to the event and to provide a neutral diagnostic term such as “acute psychological stress reaction” or express it in visual terms (“being thrown off-course”).

Short, easy-to-use screening questionnaires can also provide an early indication of the type and severity of subjective stress in routine care in the first weeks after the event. For those injured in traffic or occupational accidents, we developed and validated a simple tool (29), which can be requested from us.

A tiered approach to treatment is helpful. If only mild symptoms are present, help can be restricted to information on reactions and the favorable prognosis for symptom resolution.

Self-help guides are also available (e18–e21). As symptoms can increase over time, a repeat consultation for re-evaluation of stress should be arranged after a few weeks. If symptoms have not resolved or have even increased, local outpatient treatment options should be investigated.

If initial symptoms are severe and stress levels high, treatment should be begun immediately (e22).

Structured, trauma-focused behavioral therapy, involving several sessions, is currently considered to be most effective (e22, e23). Meta-analyses of studies of high methodological quality have shown effect sizes of 0.75 (30). Other procedures, such as psychological debriefing, either have not been evaluated or are controversial.

To date there is no evidence that psychiatric drugs can effectively prevent PTSD following a traumatic event (31, e24). Sedatives such as benzodiazepine should be prescribed only in very severe cases, such as an acute suicidal tendency. Sedative antidepressants can be used in cases of major sleep disorders. As far as possible, the first resort should be emotional and psychological support and the individual's own powers of recovery.

Effective treatments

Most trauma treatments can be provided on an outpatient basis. Inpatient treatment at a specialized facility should be considered only when the intensity, severity, and complexity of symptoms exceed the capacity of outpatient care (for criteria see [32], [German-language publication]).

According to meta-analyses and guidelines (33–35, 36, e22, e25), trauma-focused psychotherapy is first-line treatment. The best evidence available is for cognitive behavioral therapy, exposure therapy as proposed by Foa (e26, 37), and eye movement desensitization and reprocessing (EMDR) therapy (38). In other words, the effectiveness of multimodality treatment involving confrontation and cognitive processing of the traumatic experience has been demonstrated in a number of randomized controlled trials. In meta-analyses, comparison with control groups (waiting lists) has shown medium effect sizes: $d = 1.26$ to 1.53 for cognitive and behavioral therapy (including exposure therapy), $d = 1.25$ for EMDR, and $d = 1.11$ for all active treatments (35). Individual controlled trials have also shown brief eclectic psychotherapy ($d = 1.55$ [e27]), narrative exposure therapy ($d = 0.65$ [e28]), and imagery rescripting therapy (only in combination with other methods [e29]) to be effective. As the data available from randomized controlled trials is insufficient, there is insufficient evidence on the effectiveness of psychodynamic therapy, systemic therapy, body-oriented therapy, or hypnotherapy. There has also been little research into the treatment of PTSD following physical illnesses (e30) (Box 3).

Turning to psychiatric pharmacotherapy, the selective serotonin reuptake inhibitors (SSRIs) paroxetine and sertraline yield the best results in randomized controlled trials (meta-analysis [e31]: weighted mean difference [WMD] = -5.95) and are recommended in guidelines (34, e25, e31). In Germany, only paroxetine is approved for the indication PTSD. If this proves insufficiently effective, the data currently available supports the selective serotonin and noradrenaline reuptake inhibitor (SNRI) venlafaxine (though this is an off-label use). It is important to ensure that treatment

BOX 5

Potential sources of error in the diagnosis and treatment of post-traumatic stress disorder (PTSD)

- Trauma/diagnosis criteria not met
- Differential diagnosis conceals PTSD
- Feelings of shame/guilt lead to concealment of other problem areas
- Non-adherence
- Selective serotonin reuptake inhibitor (SSRI) not prescribed for long enough (several weeks) or at a high enough dose (up to a maximum or limited due to adverse drug reactions [ADRs])
- Insufficiently supportive environment
- Avoidance behavior maintained

duration is sufficient (several months) and to take into account the frequent requirement of higher doses (Box 4).

With both psychotherapy and pharmacotherapy, non-adherence and treatment resistance occur in at least one-third of patients. Box 5 provides a short, incomplete summary of potential influencing factors. A tiered approach is proposed for cases of treatment resistance (e32).

As a result of the complexity of persistent trauma-related disorders, and their range of comorbidities, it is difficult to evaluate the effectiveness of inpatient treatments. The data from a randomized controlled trial of a combination of treatments involving dialectical behavior therapy (DBT) for borderline disorder with exposure therapy is promising: Hedges' $g = 1.35$ versus a TAU (treatment as usual) waiting list control group (40). To date only a few facilities in Germany use this intensive, expensive treatment (DBT-PTSD). The care landscape is heterogeneous, and more frequently used treatments, such as psychodynamic imaginative trauma therapy (PITT) (e33), have not been evaluated in randomized controlled trials. Online therapy is currently restricted to research projects (e34).

Well evaluated treatment procedures involving the methods mentioned above have been available for several years and can effectively help alleviate the massive suffering of traumatized patients. Local therapists qualified in psychological trauma can be found via the home pages of the German-Speaking Society for Psychological Trauma Therapy (DeGPT, Deutschsprachige Gesellschaft für Psychotraumatologie: www.degpt.de) or the EMDR Umbrella Organization (EMDRIA, Dachverband für die Methode EMDR: www.emdria.de).

KEY MESSAGES

- Psychological traumatic events are common and can affect anyone.
- Even after severe traumatic events, most affected individuals (90% of men, 80% of women) do not develop post-traumatic stress disorder (PTSD).
- The diagnosis PTSD is intended for a specific pattern of persistent stress symptoms following a serious, usually life-threatening event.
- Manifest (chronic) PTSD worsens the prognosis of other physical and psychological illnesses.
- Effective psychotherapy is trauma-focused and involves addressing/confronting the traumatic event intensely. For chronic PTSD, selective serotonin reuptake inhibitors and selective noradrenaline reuptake inhibitors are recommended as possible medication.

Conflict of interest statement

Dr. Frommberger has received reimbursement of conference fees and travel expenses from Servier, Astra-Zeneca, Lilly, Janssen-Cilag, GlaxoSmithKline, and Pfizer. He has received lecture fees from Astra-Zeneca and Servier. He is a supervisor and assistant professor at the Freiburg Behavioral Therapy Training Institute.

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