

DEBATE

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Developmental trauma disorder: pros and cons of including formal criteria in the psychiatric diagnostic systems

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Abstract

Background: This article reviews the current debate on developmental trauma disorder (DTD) with respect to formalizing its diagnostic criteria. Victims of abuse, neglect, and maltreatment in childhood often develop a wide range of age-dependent psychopathologies with various mental comorbidities. The supporters of a formal DTD diagnosis argue that post-traumatic stress disorder (PTSD) does not cover all consequences of severe and complex traumatization in childhood.

Discussion: Traumatized individuals are difficult to treat, but clinical experience has shown that they tend to benefit from specific trauma therapy. A main argument against inclusion of formal DTD criteria into existing diagnostic systems is that emphasis on the etiology of the disorder might force current diagnostic systems to deviate from their purely descriptive nature. Furthermore, comorbidities and biological aspects of the disorder may be underdiagnosed using the DTD criteria.

Summary: Here, we discuss arguments for and against the proposal of DTD criteria and address implications and consequences for the clinical practice.

Keywords: Comorbidity, Developmental psychopathology, Developmental trauma disorder (DTD), Dissociation, Post-traumatic stress disorder (PTSD)

Background

Inclusion of post-traumatic stress disorder (PTSD) in psychiatric diagnostic systems represents an important milestone since a clear connection between traumatic experiences and mental disorders have not been established previously [1-3]. Clinicians in the field of child and adolescent psychiatry and clinical psychology have to face acute traumatized children and victims of different shades and forms of chronic child abuse, maltreatment and neglect.

In the clinical setting, the effects of neglect, maltreatment, and abuse are noticeable which has prompted the need for a diagnosis capable of creating the connection between developmental and psychopathological aspects.

In children and adolescents, the usefulness of diagnostic criteria of PTSD is limited because the characterization of

the condition is based on symptoms in adults. Because most symptoms are subjective and require verbal description by the patient, the diagnosis of PTSD in younger children remains challenging. In the presence of distinct, well-defined traumata and their effects, the diagnosis of PTSD can be readily made; childhood traumatization and neglect tend to be more complex and may entail a multitude of psychosocial risk factors. Therefore, various proposals for diagnostic criteria have been published which include developmental psychology factors [4-7].

Most traumatic experiences in children and adolescents occur in their immediate social environment [5,8,9]. Families with neglected, maltreated, or abused children often carry a number of additional risk factors, such as mental disorders in parents, poverty, cramped living conditions, or social isolation [5,10,11]. Moreover, childhood traumatization leads to a significantly higher risk of suffering other traumata in adult life [12,13].

Many severely maltreated, sexually abused, or neglected children who had suffered repeated traumatic events

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addition to the defined symptoms of PTSD (see List of Symptoms below):

- Symptoms of emotional and physiological dysregulation/dissociation
- Problems with conduct and attention regulation
- Difficulties with self-esteem regulation and in managing social connections.

In the following, these symptom clusters are addressed in more detail.

Symptoms of emotional and physiological dysregulation/dissociation

Chronic activation of neurobiological systems involved in the regulation of stress and emotion appears to potentiate activation of the relevant neurotransmitters and neuroendocrinological systems. This has also been implicated in severe emotional dysregulation [21,22]. Several studies reported clear differences in the aptitude of children with and without traumata in regulation and recognition of emotion [23-25].

Subjects with difficulties in regulation of emotion react faster and more fiercely to emotional stimuli and require more time to calm down after an emotional reaction. This was particularly evident in studies with adult borderline patients [26-28]. Moreover, negative emotional reactions in everyday life seem to be more easily triggered in those patients [29,30].

A. Exposure

The child or adolescent has experienced or witnessed multiple or prolonged extremely stressful traumatic events over a period of at least one year beginning in childhood or early adolescence, including:

- 1) Direct experience or witnessing of repeated and severe episodes of interpersonal violence, and
- 2) Significant disruptions of protective care giving as a result of repeated changes in primary caregiver, repeated separation from the primary caregiver, or exposure to severe and persistent emotional abuse.

B. Affective and physiological dysregulation

The child exhibits impaired normative developmental competencies related to arousal regulation, including at least two of the following:

- 1) Inability to modulate, tolerate, or recover from extreme affect states (e.g. fear, anger, shame), including prolonged and extreme tantrums, or immobilization,
- 2) Disturbances in regulation of bodily functions (e.g. persistent disturbances in sleeping, eating, and

- elimination; over-reactivity or under-reactivity to touch and sounds; disorganization during routine transitions),
- 3) Diminished awareness/dissociation of sensations, emotions, and bodily states, and/or
- 4) Impaired capacity to describe emotions or bodily states.

C. Attentional and behavioral dysregulation

The child exhibits impaired normative developmental competencies related to sustained attention, learning, or coping with stress, including at least three of the following:

- 1) Preoccupation with threat or impaired capacity to perceive threat, including misreading of safety and danger cues,
- 2) Impaired capacity for self-protection, including extreme risk-taking or thrill-seeking,
- 3) Maladaptive attempts at self-soothing (e.g. rocking and other rhythmical movements, compulsive masturbation),
- 4) Habitual (intentional or automatic) or reactive self-harm, and/or
- 5) Inability to initiate or sustain goal-directed behavior.

D. Self and relational deregulation

The child exhibits impaired normative developmental competencies in his/her sense of personal identity and involvement in relationships, including at least three of the following:

- 1) Intense preoccupation with safety of the caregiver or other loved ones (including precocious care giving) or difficulty tolerating reunion with them after separation,
- 2) Persistent negative sense of self, including self-loathing, helplessness, worthlessness, ineffectiveness, or defectiveness,
- 3) Extreme and persistent distrust, defiance or lack of reciprocal behavior in close relationships with adults or peers,
- 4) Reactive physical or verbal aggression toward peers, caregivers, or other adults,
- 5) Inappropriate (excessive or promiscuous) attempts to achieve intimate contact (including but not limited to sexual or physical intimacy), or excessive reliance on peers or adults for safety and reassurance, and/or
- 6) Impaired capacity to regulate empathic arousal as evidenced by lack of empathy for, or intolerance of, expressions of distress of others, or excessive responsiveness to the distress of others.

E. Post-traumatic spectrum symptoms

The child exhibits at least one symptom in at least two of the three PTSD symptom clusters B, C, and D.

F. Duration of disturbance

Persistence of symptoms in criteria B, C, D, and E for at least 6 months.

G. Functional impairment

The disturbance causes clinically significant distress or impairment in at least two of the following areas of functioning:

- 1) *Scholastic*: under-performance, non-attendance, disciplinary problems, drop-out, failure to complete degree/credential(s), conflict with school personnel, learning disabilities, or intellectual impairment that cannot be accounted for by neurological or other factors,
- 2) *Familial*: conflict, avoidance/passivity, running away, detachment and surrogate replacements, attempts to physically or emotionally hurt family members, non-fulfillment of responsibilities within the family,
- 3) *Peer group*: isolation, deviant affiliations, persistent physical or emotional conflict, avoidance/passivity, involvement in violence or unsafe acts, age-inappropriate affiliations or style of interaction,
- 4) *Legal*: arrests/recidivism, detention, convictions, incarceration, violation of probation or other court orders, increasingly severe offenses, crimes against other persons, disregard or contempt for the law or for conventional moral standards, and/or
- 5) *Health*: physical illness or problems that cannot be fully accounted for, physical injury or degeneration, involving the digestive, neurological (including conversion symptoms and analgesia), sexual, immune, cardiopulmonary, proprioceptive, or sensory systems, severe headache (including migraine), or chronic pain or fatigue.

Dissociation may be described as a loss of outward perception and trance-like state of mind, which is accompanied by a loss of coenesthesia and sense of time, spatial orientation, facial expression, perception of pain, and often a feeling of derealization. Dissociative disruptions may also involve the loss of memory of own and observed external actions. As shown in recent experiments [31], both learning and assimilation of new information are strongly inhibited in dissociated states. Lynch et al. [32] demonstrated that reducing dissociation tendency improves the success of outpatient psychotherapy.

While approximately 10% of the general population reacts with a stronger tendency to dissociation in response to trauma, 50% of affected individuals may suffer from chronic dissociation when faced with repeated traumatization [33,34]. Apart from the genetic disposition, susceptibility of reacting to traumatic experiences with dissociation is markedly influenced by the frequency and

nature of traumatic experiences. Furthermore, dissociation tendency is a predictor for the development of PTSD in response to traumatic experiences [35,36].

Maltreated or sexually abused schoolchildren have a much stronger tendency towards dissociation than non-maltreated children [37]. Extreme familial psychosocial stress and a tense family atmosphere are both factors that appear to potentiate this tendency [38,39].

Somatization, body and sensory perception

Among chronically traumatized individuals, body perception is frequently impaired [40]. Good body perception is necessary for recognizing, processing, and expressing emotions [41]. In traumatized individuals, perception of pain during tense conditions is diminished [42,43], and auditory perception is impaired [44]. Overall, body perception, sensory perception, experience of pleasure, and ability to focus on positive sensory perceptions such as taste and music are clearly underdeveloped in affected individuals.

Studies show a clear relationship between early experiences of neglect/malnutrition and somatic diseases (e.g. high blood pressure, coronary heart disease, diabetes) in adulthood [45]. Furthermore, there is increasing evidence that PTSD is not only associated with a higher vulnerability for comorbid mental disorders but also with an increased incidence of (psycho-) somatic disorders [46,47]. Many traumatized children suffer from severe sleep disorders [48,49].

Self-injury, high risk behavior, and sexual abnormalities

Non-suicidal self-injury [50] and suicidal behavior [51,52] constitute the symptoms most strongly linked with traumatization, particularly sexual abuse. More than 80% of patients with a history of self-injury report traumatic events in their earlier lives [53]. Given the high prevalence of self-injuries among adolescents, periodical and repetitive self-injuring behavior should be regarded separately since it is unlikely that the majority of adolescent self-injurers share a history of traumatic events. Interestingly, repetitive self-injury has been reported more often in adults with a childhood history of sexual abuse, whereas intermittent self-injury appears to be more frequently associated with physical abuse in childhood [53]. Nonetheless, a meta-analysis of 45 studies on the association of sexual abuse and self-injury only found a relatively weak relationship between self-injury and sexual abuse indicating that sexual abuse ceased to explain the variance in self-injurious behavior if the studies were controlled for other psychiatric risk factors [54]. Other studies described a relationship between self-injury and traumatization [55,56]. A recent review suggests that the association of child maltreatment and self-injury varies according to the type of maltreatment [57]. Weierich and Nock showed

that PTSD symptoms mediate the relation between sexual abuse and self-injury [55]. Self-injury probably functions as a support of emotion regulation and disrupts dissociative states and the emotional tension related to regulation of emotion [58]. Neurobiologically, self-injury can be seen as an attempt to alter the state of the autonomic nervous system that has been pushed to an extreme state by reminders of traumatic events [59].

Glassman *et al.* [60] found that traumatization leads to self-injury, particularly when shame and self-criticism transform into self-hate. Among all psychological disorders, post-traumatic syndromes are most closely related to suicidal ideation and are associated with the highest suicide rates. PTSD symptoms like flashbacks, nightmares and intrusions were reported to be significantly associated with tension, dissociation and self-injury [53,58]. The literature concerning the association between a history of traumatic events and suicidal behavior is particularly consistent. Recent data from the World Mental Health survey (21 countries, $n=55\,299$) showed a strong relationship between childhood adversities (odds ratio [OR] for suicide attempt after sexual abuse: 5.7) and suicidal behavior, such as suicidal ideation or attempts [51].

Children who have experienced sexual abuse seem to be more preoccupied with their sexuality, show more sexualized behavior, and may exhibit compulsive masturbating behavior [61,62]. Several reviews suggest that impulsive high-risk-behavior in adolescents (e.g. unprotected sexual intercourse, risky behavior in traffic, carrying arms) often occurs in young individuals who have been traumatized [63]. In particular, early substance abuse is likely alongside impulsivity and psychosocial risk factors [64].

Difficulties with executive functions and the regulation of attention

Studies in heavily deprived Romanian orphans showed that without a minimum of stimulation during the sensitive phase of development, cognitive development is sustainably impaired [65-67]. Executive functions, such as attention span, distractibility, and the ability for serial structuring and making plans are particularly affected. However, there is a clear distinction between these traits and the symptoms of attention deficit hyperactivity disorder (ADHD) [67,68]. The work group around Michael Rutter analyzed the intelligence profiles of traumatized and neglected Romanian residential care children after adoption by families in the United Kingdom and noticed that these children show deficits in their executive functions [65,68]. On the neuropsychological level, self-regulation of more complex behaviors and future orientated planning in daily life appear to be limited or impaired, because complex traumatized children have learned to focus on the next moment to survive and not to overlook broader timeframes [17,19]. Some studies

showed different significant problems in working memory in students following sexual abuse and childhood trauma [69,70]. Endo and colleagues [71] found that dissociative children meet criteria of ADHD whereas non maltreated children with ADHD do not show dissociative symptoms.

Difficulties in self-regulation and establishment of relationships

Eighty percent of all traumatized (physically abused) children show a disorganized style of attachment [72-74]. Abused and neglected children often develop highly insecure representations of attachment [75,76] and show promiscuous and non-selective behavior in their attachment to adults [67,77]. Other studies found that exposure to interpersonal trauma leads to social isolation [78]. Attachment is an important resilience factor for preventing the development of a mental disorder after traumatization. Emotional support provided directly following a traumatizing experience reduces the risk of developing PTSD [35,36]. Moreover, positive relationships enhance the success of psychosocial interventions [79].

Perception of social situations is altered in traumatized children because they are highly sensitized to potentially threatening stimuli. Dodge and Schwartz [80] showed that traumatized children tend to interpret neutral behavior of other people as hostile and react to more aggressive behavior with fear or even dissociation. Furthermore, abused children react stronger and more impulsive to negative facial expressions, especially to those of anger [23,81-83]. This hypersensitivity to potentially threatening stimuli often leads to aggressive reactions in affected individuals [80,84,85]. Probably reduced grey matter in the visual cortex represents a neurobiological correlate of difficulties in the recognition and interpretation of emotions and social skills [86].

Traumatized individuals often develop feelings of self-reproach, guilt, and shame [87]. Development of a healthy self-image is substantially impaired in traumatized subjects. The impact of abuse and neglect on the development of self-esteem (self-insufficiency, defectiveness) has been addressed in longitudinal studies [85,88]. Kim and Cicchetti reported that feelings of shame caused by traumatization were responsible for interpersonal problems in adulthood [88].

Several studies have addressed empathy, theory of mind, and the ability for mentalization in traumatized and heavily neglected children [89,90]. The ability of taking the perspectives of others was diminished, increasing with the length of the children being in conditions of deprivation [66]. When studying mentalization [91], the ability to take the perspective of others in emotional situations involving pressure was of main interest. Under such circumstances, deficient regulation of emotion and lacking ability to take others perspectives are additive.

Discussion

Because of scientific discussion among the long term consequences of childhood trauma and the criteria of development trauma disorders a discussion among pros and cons of the introduction of such a diagnosis in the revision of DSM-V and ICD-11 started (see Table 1).

Arguments for and against a systematic diagnosis of DTD

Arguments in favor of formalized DTD diagnostic criteria

The following arguments support the initiative to include DTD as a distinct mental disorder in diagnostic systems:

- *More specific diagnosis:* The diagnosis of PTSD does not sufficiently take into account the symptoms of traumatized patients. The postulated DTD diagnostic criteria comprise a range of symptoms seen to occur after complex and repeated traumatization. For the diagnosis of DTD, traumatic experience is essential but not exclusive, and genetic and biopsychosocial origins of the disorder must be ruled out to specify the interaction between neurobiology, epigenetics and transgenerational traumatic life events and their consequences for the development of mental disorders. The existence of specific and validated DTD diagnostic criteria may sensitize professionals and the general public to the drastic consequences of child abuse, neglect, and traumatization. Moreover, the establishment of measures for e.g. child protection, policy making would be expedited.
- *Course of mental disorders:* The supporters of this initiative argue that more emphasis should be placed on developmental aspects of disorders caused by traumatization. The few longitudinal studies available indicate that more than 60% of adults with psychiatric disorders suffered from psychopathological symptoms during adolescence, and 77% exhibited symptoms before the age of 18 years [87,92]. Furthermore, PTSD

frequently becomes chronic. In a longitudinal study in adolescents with PTSD, 48% of patients still met the criteria for PTSD three to four years later [93].

- *Enhance research:* Establishment of formal diagnostic criteria for DTD is expected to stimulate research efforts in this area (e.g., epidemiological studies, developmental-psychopathological research). Cross-sectional and longitudinal studies on psychosocial risks and comorbidities during childhood and adolescence should be encouraged.
- *Explain comorbidities:* From a clinical point of view, the diagnosis of DTD focuses on traumatization as the psychopathological trigger of mental disorders [94]. Several well-designed studies clearly demonstrated such correlations. Post-traumatic symptoms may occur together with other mental disorders. As many as 80% of PTSD patients meet the criteria for another disorder [95-98]. In an evaluation of the 'Dunedin longitudinal study', Koenen *et al.* [15] showed that all subjects meeting the criteria for PTSD in young adulthood had suffered from mental disorders at a young age. Conversely, other mental disorders may be present before PTSD or may develop after its occurrence [15,87,92]. In particular, victims of sequential traumatization have an inherently high risk of developing a complex syndrome of disorders that often go hand-in-hand with single symptoms of PTSD without fulfilling the complete clinical picture of PTSD [14]. In children and adolescents, comorbidities with ADHD, anxiety disorder, suicidal thoughts, and a trend towards affective disorders is highly prevalent [1,98].
- *Enable effective treatment:* By selectively treating trauma symptoms, patients can be stabilized, and concomitant illnesses (like anxiety disorder or depression) can be addressed. The effectiveness of therapeutic interventions in traumatized children and adolescents has been well documented in recent years [99-103]. Spinazzola *et al.* [104] pointed out that more

Table 1 Arguments for and against the introduction of development trauma disorder in the psychiatric diagnostic systems

Arguments: pro development trauma disorder	Arguments against development trauma disorder
Specific diagnosis for observed symptoms from severely traumatized children	Conflicts the traditional diagnostic systems on constraining on the description of symptoms
Regards developmental psychopathology and the course of mental disorders	Assumed mono-causality is conflicting bio-psycho-social model of the etiology of mental disorders
Explains co-morbidity	Underestimates the aspects of inverse correlations of psychopathology and traumatization
Enables effective treatment for co-morbid disorders	Selectivity underestimates the role of resilience
Enhances research in the field of developmental psychopathology and trauma related disorders	Higher risk to miss co-morbid disorders and effective (psycho-) pharmaceutical treatment
Show scientific based arguments for a improvement of child protection, prevention and resources of youth welfare services	Failed to define age-related symptoms
Explains severe problem behavior, for example reactive aggression, chronic dissociation and self-injury	Trauma focused explorations might lead to a problem focused exploration style

attention should be given to naturalistic studies in inpatients suffering from psychosocial stress being at risk of suicide.

Patients with severe interpersonal traumatization in childhood are the hardest to treat and have the poorest prognosis. Treatment may be constrained by insufficient understanding of the underlying illness, and patients often cannot be reached by the psychosocial care system. Moreover, the degree of traumatization affects treatment success. Therefore, it is important to take the nature and severity of traumatic experiences into account when developing a treatment plan. With a more specific diagnosis, treatment options can be tailor-made.

- *Social and legal aspects:* Many victims of neglect, child abuse, and maltreatment live on the edge of society and depend on social services for most of their lives. Failures at school and in youth welfare institutions are common [105]. Clear definition of trauma-related symptoms could help to change attitudes towards delinquent or aggressive adolescents and facilitate the initiation of treatment [106]. Several studies have addressed the enormous healthcare costs arising from traumatization, such as medical treatment costs, early retirement, inability to work, need for social benefits, and even imprisonment [107,108]. If the consequences of childhood traumatization were officially recognized, patients would benefit from improved social acceptance of their difficulties. Moreover, inclusion of mental disorders arising from complex traumatization in the official diagnostic systems would assist patients in obtaining compensation and legal support (court, victim aid). Many traumatized patients develop chronic mental disorders with serious impairment of their working ability and social interactions. Early and effective intervention is necessary to help patients to maintain a normal life style.

Arguments against formalized DTD diagnostic criteria

The following arguments question the usefulness of including DTD as a distinct mental disorder in diagnostic systems:

- *Conflicting DSM and ICD diagnostic systems:* Formal DTD diagnostic criteria are thought to weaken the power of existing diagnostic systems, such as DSM-IV-TR and ICD-10. Both diagnostic systems were strictly designed to exclude any theory about the etiology of the mental disorders and confine themselves to a clear and operationalizable description of the symptoms and disorders. Since Axis V of the multiaxial diagnostic system covers psychosocial risk factors, aspects associated with chronic exposures to traumatic events

are included in existing systems. In addition, critics claim that there is no clear distinction between symptoms and syndromes, and that DTD criteria overlap with those of some established and some discussed diagnoses. Many symptoms of borderline personality disorder or attachment disorder are included in the list of DTD symptoms, thus impeding the distinction between these disorders. Similarly, DTD criteria overlap with those of attachment disorders, conduct disorder, multiple complex development disorders (MCDD) [109] or the criteria for borderline disorder in childhood and adolescence [28]. Although, all of these diagnosis have a high prevalence among people with traumatic life events, problems with validity and reliability [110,111] and high comorbidities with other mental disorders. Some diagnosis like multiple complex trauma disorder and borderline personality disorder in childhood are not part of the diagnostic systems.

- *Monocausality:* concerning the diagnosis of DTD, monocausality is assumed, but this has not been proven [112]. DTD diagnosis favors a psychosocial explanation for the etiology of the disorders and neglects the biological explanations of the biopsychosocial model to understand the development of mental disorders. DTD is frequently manifested as a mixture of symptoms and syndromes, and a unidirectional relationship between traumatic experiences and the development of a confined syndrome remains is based on a widespread of actual research in the field of psycho traumatology. Moreover, genetic/biological causes of the symptom pattern may be ignored when diagnosing DTD. Critics of a formal DTD diagnosis point out that those similar symptoms may be present in individuals who did not have any traumatic experiences. In line with this, 20% to 30% of patients with borderline personality disorder, whose criteria are similar to those of complex PTSD, had not suffered from any traumatic experience [30]. By explaining complex symptom patterns by a single cause, other disorders that require treatment may remain untreated. Focussing on trauma etiology it might be possible that other comorbid diagnosis like ADHD will not be taken into account and missed to treat with evidenced based interventions. Furthermore, assumption of traumatization as the single cause of the disorder may result in too much importance being attached to identifying the causative traumatic experience, thus ignoring positive life experiences that would facilitate a resource-orientated therapeutic relationship, especially with the parents.

- *Selectivity:* Certain children who had been severely traumatized do not develop any mental disorder [113]. Of course this is a weak argument because skeptics can argue in the same way against the classic PTSD diagnosis.

According to Malinosky-Rummell and Hansen, 80% of adults who had been physically abused during childhood showed no mental disorder in adulthood [114]. However, Collishaw *et al.* [115] found considerably weaker psychopathological resilience in a follow-up analysis of adults who had experienced maltreatment during childhood. Furthermore a study of the Dunedin birth cohort (in [15]) suggested that the risk of developing a mental disorder increases with repeated traumatization. Individuals who did not develop any symptoms were found to have good peer relations, success at school and work, and stable relationships. Current research into resilience increasingly focuses on dynamic factors, such as behavior and attitude, which enhance individual or familial resilience [113], and their correlation with genetic factors. Conversely, non-traumatized individuals may develop similar symptoms. The formal DTD criteria do not explain this phenomenon. In addition, there is a relatively high overlap with existing and well-established mental disorders (e.g., borderline disorder, attachment disorder with disinhibition, etc.).

- *Inverse correlation:* Diagnosing DTD implies that emotional dysregulation is caused by traumatic experiences but ignores the fact that the reverse relationship also exists. Emotional dysregulation is accompanied by a higher risk of traumatization. It is well established that subjects with impaired emotional control may adversely respond to environmental factors, thus reinforcing the present symptoms [116]. This correlation was described in the transactional model by Fruzzetti *et al.* [116]. Furthermore, children with externalizing disorders have a four times higher risk of being abused [117].

- *Age sensitivity:* Although the proposed diagnostic criteria are meant to take the age and developmental status of the patient into account, symptoms are not sufficiently stipulated age-sensitive. But of course this is a problem of every diagnosis in childhood and adolescence – regarding the actual debate among assessing symptoms of attention deficit and hyperactivity disorder ADHD in childhood, adolescence and adulthood [118]. Furthermore the criteria claim to be development-oriented, however they fail to specify the symptoms for different age groups. Thus, no distinction is being made between young children and adolescents with respect to emotional and physiological regulation. This is due to the limited knowledge about the course of trauma-related symptoms and the methodical problems in longitudinal studies to address the same construct in different age groups with other psychometric methods. Additionally clinical studies are limited by ethical restraints.

- *Treatment:* The main purpose of accurately diagnosing psychopathological conditions in children

and adolescence is the endeavor to treat them effectively. Critics of the introduction of formal DTD diagnostic criteria argue that comorbidities may remain untreated because too much emphasis is placed on trauma-related aspects of the condition. This can provoke misinterpretations of biological symptoms with the consequence that effective psycho-pharmaceutical treatment options stay unused.

- *Disadvantages of trauma-focused diagnostic explorations:* For inexperienced professionals the concentration on trauma-related symptoms in the diagnostic process may result in a pressure to detect traumatic life events. This kind of exploration might have a negative influence on the therapeutic relationship, especially to parents of multi-problem families. It can be difficult to combine a trauma-focused exploration style with solution focused interventions. But without the development of a sustainable therapeutic relationship every treatment will fail. Another negative aspect of trauma-focused diagnostic exploration could be that patients will be pushed in an implicit or explicit way to remember or to talk about traumatic events. It is even possible that some trauma-focused exploration styles provoke false memories of biographical life events with several negative consequences [119].

Summary

There is considerable controversy with respect to implementing formal DTD diagnostic criteria; based on existing empirical studies the correlation between traumatic experiences and related symptoms is not in question among experts. Studies focusing on the neurobiology of mental disorder in childhood have clearly identified traumatization as an important cause [120].

The current debate on the need for a formal definition of DTD criteria highlights the important role of traumatization and neglect in the development of complex psychopathological disorders that are difficult to treat. Awareness of long-term outcomes of child abuse and neglect may strengthen the acceptance of initiatives to protect children from maltreatment and improve attitudes towards 'difficult' adolescents who live at the edge of society. A better understanding of the effects of traumatization might lead to improved psychosocial treatment options for these children and adolescents and may help to prevent from participation restrictions in the society.

The arguments for and against implementing formal DTD diagnostic criteria are convincing, and the debate can only be resolved conclusively based on the emergence of new information. Sophisticated neurobiological and genetic studies are needed because traumatization is known to affect prenatal factors, such as endocrinological

processes during and after pregnancy, or even genotype [121-124]. Moreover, longitudinal studies are necessary because DTD is not a static but a rather dynamic condition, undergoing changes in its manifestation over time. An innovative method using a developmental-heterotopic approach has been described by Fegert *et al.* and Schmid *et al.* [4,125,126].

In addition, clusters of mental disorders should be identified, and interaction of psychosocial and biological aspects in the development of these clusters should be addressed. Such an approach would help to explain the pervasive nature of trauma-related psychopathological disorders.

Trauma experts working in specialized institutions that deal exclusively with traumatized individuals tend to be the main supporters of a formal definition of DTD diagnostic criteria, while professionals working in the general clinical and psychiatric setting remain critical for the reasons stipulated above. Regardless of the outcome of the ongoing debate, treatment of severely traumatized children and adolescents should be improved substantially. Although trauma outpatient clinics offering symptom-specific treatment will be of help, general psychotherapeutic professionals also need to be trained in this area since many traumatized children are encountered in the clinical setting. Therapeutic concepts currently available for hospitalized patients are grossly inadequate to address the dramatic sequel in severely traumatized children. Trauma-specific concepts of outpatient treatment with possible inpatient interval treatment should be developed and implemented [101,127-129], taking the specific needs of children and adolescents into account as well as the need of their parents, foster parents or residential care staff. It is important to be able to combine both treatment needs: to maintain a "save place" and to have the possibility to do effective (prolonged) exposure therapy. For severely traumatized patients a combination of a skill training and trauma therapeutic exposure treatment is currently regarded to be the best approach [101,103] with the least drop-out rates. The trauma system therapy as a model of combined milieu therapeutic, systemic / family centered and psychotherapeutic intervention is a very promising and, as the first results show, successful treatment approach for children and adolescents suffering from complex trauma or developmental trauma disorder [130]. The psychotherapeutic skill training focuses on the capacities to cope with dissociation, emotion regulation problems, situations of extreme stress and tension as well as intrusions, disgust and social problems [101,103,127]. The additive skill training will help to overcome tension and dissociation during the exposure therapy and is a kind of precondition for exposure therapy with complex traumatized patients with fewer capacities to cope with stress, tension and dissociation [131]. The dialectical behavior

therapy and their adaptations for adolescents [132,133] are the best evaluated treatment concepts to improve these skills. For such treatment concepts to be effective, specialized wards are needed, which will probably require inpatient treatment for a greater catchment area and build a network of outpatient therapists cooperating with this specialized ward.

As many severely traumatized children and adolescents cannot stay in their families of origin, psychiatric liaison services for adolescents in residential care institutions and youth welfare services should be implemented. These liaison services can help to reach more burdened children, reduce inpatient child- and adolescent psychiatric treatment days and improve continuity in residential and foster care placements [134]. Youth welfare concepts should be sensitized to trauma symptoms and try to promote and enhance resilience factors, self-efficacy and social and emotion-regulation skills [106]. In conclusion, the available arguments for and against the implementation formal diagnostic criteria for DTD cannot be appraised conclusively based on current research. The main advantage appears to be improved sensitization to trauma outcomes and more tailor-made treatment options, but this may also be achieved by a descriptive approach. A dimensional diagnostic system comprising the relevant domains, such as relationship / attachment representation, assessing interpersonal trust, emotion regulation, affinity to dissociation / sensual perception, and lacking expectation of self-efficacy, could also be envisaged. Specific symptom scales for emotion regulation, attachment/ interpersonal trust, self-efficacy and dissociation may be effective in predicting the outcome of psychotherapeutic treatment. These symptom scales may show relevant aspects of developmental psychopathology, can support the diagnostic process, and help to develop individualized treatment concepts with specific guidelines for the arrangement of the therapeutic alliance. Probably the sensitization to trauma symptoms and the interpersonal learning history of a patient can prevent drop-out and improve the therapeutic outcome.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

JMF and FP contributed equally to this work. This paper is based on a former German publication by MS, JMF, FP. (2010) Traumaentwicklungsstörung: Pro und Contra. *Kindheit & Entwicklung*, 19 (1), 47-63. All authors read and approved the final manuscript.

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