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A DIFFICULT DIAGNOSIS. CONTROVERSIES AROUND PTSD AND ADHD

Abstract: The article touches on the diagnostic problems faced by psychologists, pedagogues, and psychiatrists who try to determine the psychopathology of the difficulties in the behaviours of children. The current study focuses on the analysis of the clinical picture and the genesis of the disorders occurring as a result of an extremely stressful event (PTSD) and also attention-deficit hyperactivity disorder (ADHD). These disorders are full of diagnostic uncertainties when occurring in

children. The analysis of the two disorders is based on the diagnostic criteria of DSM-5. The analysis of their etiology is based on the data concerning the functional characteristics of central nervous system. The article is summed up by an attempt to name the elements necessary for the differential diagnosis of the two disorders.

Keywords: PTSD, ADHD, diagnosis of child, trauma.

INTRODUCTION

The article is a response to requests of psychologists, psychotraumatologists and parents, who struggle with their own helplessness when dealing with children presenting symptoms so untypical that they can match at least several behavioral disorders. Quite often, in therapeutic work, there are cases of children incorrectly diagnosed, which leads to inadequate therapeutic treatment and, not uncommonly, also pharmacotherapy. This state of affairs results not only from the diagnostician's lack of competence, but also from the fact that some groups of disorders, especially in the case of children, do not make a clear picture and are masked and modified by current developmental tasks or their performance is sometimes hindered. This situation leads to over-diagnosing or under-diagnosing of symptoms of some disorders. Quite often mistakes of this sort occur in the case of posttraumatic stress disorders and attention deficit hyperactivity disorders. The article offers an overview and it does not deal with the issue comprehensively; it points, however, to real problems of differential diagnosis of disorders, especially those among children, and it also should inspire a more in-depth consideration of the problem.

NOTION OF TRAUMATIC STRESS

An experience of trauma in an early developmental stage is more and more commonly listed by clinicians among the etiologies of psychological disorders. Trauma, according to DSM-5 (APA, 2013), is determined as a special type of stressful event in the form of danger to life, serious injury, sexual harassment, which occur in a given context. According to DSM-5, such a context, in order to match the traumatic experience criteria, should fulfill at least one of the following four conditions: (1) direct experience of traumatic event, (2) being a direct witness to a traumatic event, (3) an indirect experience of hearing the news about a close family member or a friend being exposed to a trauma, (4) repeatable or extreme exposure to aversive details of traumatic events (e.g. during professional activities). It should be noted that in the criterion defined in such way, indirect exposure in non-professional context is excluded (electric media, television, films, photos, APA, 2013). In this understanding, trauma is seen as a type of heavy stressor which causes a risk of life loss or serious body injury; most often, its character is sudden and; it can also refer to a situation in which a person is a witness to a similar event (Folkman, 2011; Skinner, Zimmer-Gembeck, 2011; Solomon, Heide, 1999; Terr, 1995).

According to some, this definition is too narrow and its content is inadequate in the context of traumatic situations such as emotional violence, humiliation, forcing or sexual harassment (Briere, Scott, 2010). Researchers propose another definition, referring to a broader notion of trauma, assuming that it is a phenomenon of serious danger to psychological integrity due to the experience of an extremely upsetting event during which a person cannot cope despite using their resources (Briere, Scott, 2010). In a broad view, a trauma can be defined as all psychological injuries occurring during various stages of human life (crises, conflicts, life-endangering chronic somatic and mental diseases) which are connected with a risk of emotional, cognitive and social disorders. The definition-related controversies around trauma refer mainly to the categorization of events as potentially traumatic and, consequently, diagnosing traumas occurring in childhood.

Lenore C. Terr (1991) points to two basic types of trauma experienced at this stage of life: Type I and Type II. Type I is a result of a single and short event, usually a very intensive one, while Type II refers to long-lasting and repetitive situations, resulting from an exposure to traumatic external factors. In the literature on the subject, the notion of a 'potentially traumatic stressor' is sometimes used, which underlines the difference between an objective event and an individual reaction to it. According to this view, an event is traumatic when, even though it has a different literal meaning, it evokes posttraumatic symptoms (Lis-Turlejska, 2000).

Apart from the narrow and broader understandings of trauma and the types (I and II), there is also a categorizing criterion which considers whether the elements depend on the human or whether they remain outside their influence (Dudek, 2003). Depending on the interpersonal engagement, trauma can be placed on a continuum starting from impersonal natural disasters or accidents, through interpersonal – rape, sexual harassment, terrorism – and finishing with attachment traumas (Allen, 2005). One basic difference between the interpersonal and the attachment trauma is that the former evokes fear of another person and the latter can result in a fear of emotional closeness and dependence, or both.

CONSEQUENCES OF TRAUMATIC EXPERIENCES FOR CHILD AND FAMILY

A childhood trauma – as an emotional injury – influences particular areas of psychological development of a child and its integrity, which can disable further correct functioning by exceeding adaptive resources of the child (Margolis, 1999). An injury, being a traumatic event, triggers activation of a number of defense mechanisms, which by means of manifestation in symptoms influence an individual's functioning. This state is generated in a child especially as a result of not receiving support and help from the adults in a situation of danger. A child does not have fully developed, mature strategies of dealing with stress; moreover, he or she is fully dependent on the guardian. As a result of a traumatic event, the accompanying feeling of omnipotence of his or her own and the protecting parent is taken down. These conditions result in the fact that one natural consequence of a traumatic experience is fear of losing one's own or a close person's life and helplessness in the situation where a child is a victim or a witness.

One consequence of an experienced trauma are traumatic contents, which demand diagnostic verification and an appropriate treatment in the therapeutic process. The most common ones are lack of trust towards adults, lack of feeling of security, lack of control over situation. The effects of the injury depend on several factors. These are, among others: parental support, health condition of the child and its guardian, developmental phase, quality of early relations between the child and its guardian. An early trauma has an influence on the emotional, social and cognitive development of a child. Analyses reveal that this has long-lasting consequences, also in adulthood, demonstrating itself not only in physiological disorders, but also in depressive and dissociative disorders and personality disorders or anxiety disorders (Levitan et al., 2003; Matza et al., 2003). All these can be defined as chronic disorders resulting from an experienced trauma. Such experiences significantly influence particular areas of development. A trauma experienced at such an early stage changes the process of organization of a developing brain (Perry et al., 1995). Particularly big changes take place in the brain structures of the youngest children (0–3 years old), who at the time of the event were not yet able to speak fluently and competently. The younger a child is, the less matured the mechanisms of handling an injury (Briere, 1992; Briere, Scott, 2010; Perry, Pollard, 1998). These factors contribute to the changes to a child's behavior, which in their manifestation are not always clear; this causes diagnostic difficulties and, therefore, worsens the problems with matching an appropriate treatment. It is not uncommon, then, that the symptoms, instead of going away, keep manifesting more and more visibly.

SYMPTOMS OF POST-TRAUMATIC STRESS DISORDER IN CHILDREN

Symptoms of post-traumatic stress disorder (PTSD) vary depending on the child's age. Among postinjury consequences one can name symptoms occurring in various areas of functioning, characterized by different intensity and seriousness, depending on the developmental stage at which a child currently is and on external factors connected with the situation and the type of support. Among newborns below 6 months old, basic symptoms are: awakens, over-responding to stimuli, irritability, physiological disorders, significant withdrawal. Up to 1 year of age, one can observe intensification of anxiety responses in new situations, anger, avoidance of some situations through in-

creased mobility, sleep disorders. Between 1 and 1.5 years of age, children's reactions to words connected with an injury start to be noticeable, and during the next developmental stage, reactions to symbols connected with the trauma can be seen together with sudden responses and sleep anxiety (Gil, 2006; Scheeringa et al., 1995; Taylor, 2010; van der Kolk, Fislér, 1994). Verbal capability for expression of a traumatic experience depends on whether at the time of the event the speech ability was present or not (whether the child was capable of speaking). All of the above factors make the diagnosis of a child at such an early stage of life more difficult and less clear.

Based on the analysis of symptoms of post-traumatic stress among the youngest children (Scheeringa et al., 1995), it is reasonable to diagnose PTSD in infants (up to 48 months of age), if at least one criterion of the following four is fulfilled: repeated experiencing, lowered activity (observable social withdrawal, rigid affect, loss of previously obtained skills), hyperactivity (reacting with fear to stimuli, irritability or arousal of a child, sudden anger attacks, problems with concentration or attention focusing), fear and aggression (aggressive behavior, close contact with guardians), fear of toilet or objects. Further characteristic features, especially among the youngest children, are also symptoms of regression and increase of separation anxiety (Dąbkowska, 2014; Taylor, 2010). The experience which causes the most profound injury in this age group does not need to be violence directed towards the child; it is often rather a situation in which a child was a witness to violence directed towards his or her closest person. These children are most likely to develop PTSD symptoms. Additionally, it should be noted that among infants older than 18 months more symptoms of recurring stress were observed than among younger babies (Scheeringa et al., 1995).

In the case of children older than 2 years, one can observe symptoms characteristic of older children classified in DSM-5 (diagnostic criteria for six-year-olds and younger children). Among these children, additional symptoms include: reacting with difficulties in interpersonal relations, lowered self-esteem and self-value. One should notice that the existence of a variety of children reactions also contributes to diagnostic problems. Children may not show some symptoms at all or may not show them all at once, symptoms may be postponed or have a somatic form.

To conclude, the criteria for the diagnosis of PTSD among children up to 6 years old rely on several important elements. First of all, they concern children who experienced an event which could inflict injury on anyone (they were a witness to such an event or they were informed about it, especially when it concerned a guardian) and, as a consequence, they re-live it multiple times in various ways, reacting with withdrawal and increased tension (Pynos, 1990). According to DSM-5 (APA, 2013), in order to diagnose PTSD, of essential character is the presence of concrete symptoms of re-living, withdrawal, arousal and changes to the functioning resulting from a traumatic experience and occurring after the event, such as:

- recurring unwanted and intrusive stressful memories of a traumatic event, which in the case of children can be spontaneously expressed when playing and do not need to seem stressful;
- repetitive nightmares whose content and/or affect can be related to a traumatic event, although sometimes the terrifying content of dreams does not need to be clearly related to the experienced event;
- dissociative reactions (flashbacks), in which a child can feel or behave as if the traumatic event was repeating (sometimes with complete loss of the awareness of

the surroundings); like in the case of intrusion, re-playing of the situation connected with trauma can also occur during play;

- intensive or prolonged stress reaction to exposition to signals (external and internal) symbolizing or reminding of an aspect of a traumatic event;
- physiologically significant reaction to these signals (APA, 2013).

Another criterion refers to sustained avoidance of stimuli associated with a traumatic event or/and negative changes in cognitive or emotional processes. These symptoms must occur after the event or intensify after its occurrence. Sustained avoidance of stimuli refers to activities, places or physical symbols associated with a traumatic event as well as to making an effort to avoid conversations and interpersonal contacts which induce memories of the trauma. Negative changes in cognitive processes refer to a significant increase in the frequency of experiencing of negative affective states (for example, fear, guilt, sadness, shyness, shame) with a simultaneous lowered capability of experiencing positive affects. As a result of the aforementioned factors, a child presents a significantly lowered interest or partaking in important activities, including limited participation in play. For instance, a play which was particularly attractive does not bring joy and restrictions on the expression of positive emotions remain. Moreover, behavioral changes in terms of social withdrawal, are also observable, influencing the overall picture of a child's functioning.

The next criterion refers to significant changes to arousal and reactivity connected with a traumatic event which have occurred or intensified after the event and are manifested in irritability, outbursts of anger (even when slightly provoked or not provoked at all), usually expressed verbally or through physical aggression directed at people and objects (including outbursts of anger, often extreme ones). In addition, in children who were victims of traumatic events, the guardians observe intensified alertness, exaggerated reaction of fright, significant problems with concentration and sleep disorders (e.g. difficulties with falling asleep, continuity of sleep, restless sleeping).

If the aforementioned symptoms sustain for over a month, causing a clinically significant distress or problems in relations with parents, siblings and other guardians or in functioning at school, PTSD can be diagnosed. The excluding criterion is experiencing such states as a physiological effect of substance abuse (for example, alcohol, drugs) or other medical factors.

It should be noted that specific diagnostic criteria can point to a different diagnostic unit depending on the duration of symptoms and the onset moment. For instance, when the symptoms are occurring up to 30 days, the criteria point to acute stress disorder (ASD). Furthermore, the DSM-5 classification distinguishes also two specific disorders occurring in childhood in connection with experiencing a specific type of traumatic events during this developmental stage. These are reactive disorders of attachment and uninhibited engagement in social relations (APA, 2013). The former is characterized by persistent deviations from the norm in terms of attachment creation patterns in the child; these are linked to emotional disorders (lack of social and emotional reactivity to others, limitation of positive affect, episodes of unjustified irritability, sadness, anxiety). The latter manifests itself in a decrease or lack of appropriate inhibition in initiating relationships with adult strangers.

Considering post-stress symptoms in children, one can observe some differences depending on the age and sex. There are two main responses to stress: awakens and dissociation. Younger children and girls tend to react with dissociative disorders in the forms of avoidance, freezing, escape in daydreaming, fugues, depersonalization

and even catatonia. Such reactions are caused by reactions at the neurobiological level; their exact etiology remains unknown, but it is likely that a significant role here is played by opioids, dopamine systems and HPA axis. Among older children, hyperactivity of the sympathetic system is more likely to be observed (Ornitz, Pynoos, 1989; Perry et al., 1995; Scheeringa et al., 1995). These factors result in older children and boys being more likely to react in the model of hyperactivity and aggression. Children can have aforementioned nightmares or wake up with fear, unable to remember their dreams. They can complain about headaches, stomachaches or other physiological distresses. Co-occurrence of anxiety disorders, depression, attention deficit and behavioral problems is common. Children who have experienced a psychological injury are prone to addictions and risky behaviors.

In the later stages, apart from the previously described most typical disorders connected with traumatic stress, the literature on the subject distinguishes also the complex post-traumatic stress disorder, which is connected with a prolonged or repetitive trauma, starting in childhood. The basic characteristics of this disorder are: sense of guilt, stigmatizing, disorders of personal identity (the continuity of *I* – problems with the integration of the past and the present) and disorders of social identity (Herman, 1998; Solomon, Heide, 1999). These disorders result from childhood traumas and can be observed in victims of such experiences. It should be noted that disorders following traumatic stress are not developed by all children who have been exposed to crisis experiences. An analysis conducted to address this aspect has shown that the prevalence of events potentially capable of producing post-traumatic stress disorders among children and adolescents is at the level of 59–70% (Dąbkowska, 2002). One in every four children experiences symptoms of PTSD (Cohen et al., 2010).

ELEMENTS INFLUENCING PROBLEMS WITH DIAGNOSIS

If the definition of a trauma alone is problematic and depends on the broader or narrower understanding, similar controversies apply to the diagnostic process. In the case of younger victims of traumatic events and their consequences in adulthood, trauma often requires adopting a broader perspective. This broader perspective makes it also possible to turn attention to the context of traumatic experiences, which is particularly important in a situation of child abuse. In the case of trauma diagnosis, both overestimation and underestimation happen. There are various reasons for such a state of affairs and they refer both to the ways of analyzing trauma, analysis and assessment of relationships between people's resources and the traumatic event and to the individual perception and assessment of the situation as well as support availability. At the same time, overestimation and underestimation of trauma significantly impact an individual's functioning, his or her quality of life, health condition and social functioning.

Diagnosis of emotional disorders as post-traumatic stress disorder in children can be difficult because of masking of delayed symptoms, timing of their onset and concealment of problematic symptoms due to the sense of guilt and shame, unrecognized relationship between the traumatic event and emotional emptiness, anger, anxiety and physiological symptoms, which, in the case of children, can be revealed several months after the event. Some parents, unaware of the existence of this disease, believe that the symptoms will go away on their own and that there is no need to seek help. Moreover, diagnosis of a post-stress disorder is not popular among psychiatrists, also because of the fact

that it is a disease which coexists with many other disorders, such as; depression, specific phobias, addictions – which all stand out. One deficit which is quite often mistaken for PTSD is the attention deficit hyperactivity disorder (ADHD). In therapeutic practice, there are many cases of children diagnosed with this disorder, who, after a more thorough, differential examination turn out to match criteria for PTSD. What is more, a remission of symptoms is observed after therapeutic activity. Therefore, the issue at hand requires us to have a closer look at the clinical picture of this other disorder (ADHD).

ATTENTION DEFICIT HYPERACTIVITY DISORDER

Attention deficit hyperactivity disorder, often referred to as ADHD, is a neurodevelopmental disorder, whose prevalence is estimated to be around 3–6% of the population of early school age children (Pisula, 2003). One characteristic trait of children with ADHS is the presence of some permanent patterns in their behavior, which form a triad considered characteristic of this disorder: attention focusing disorders, impulsivity and hyperactivity (Barkley, 2006; Wolańczyk, Komender, 2007).

Attention deficits are manifested in too short periods of attention focusing in relation to the developmental capabilities or in problems with sustaining prolonged attention on a given activity even in favorable external conditions (Borkowska, 2006; Świącicka, 2005; Wolańczyk et al., 1999). Among these children, the mechanism of attentional selection also does not work effectively, which makes it hard for them to pick up the most relevant stimulus and causes them to get distracted under the influence of irrelevant stimuli. Impulsivity means that a child with ADHD acts under the influence of an impulse occurring at a given moment, without foreseeing the consequences of a given action for the child and for other people (Borkowska, 2006). The actions undertaken by a child are, therefore, not well thought out but rather an immediate response to the situation. Hyperactivity can be seen in intensified mobility of a child, which is not connected to a targeted action. It can take on the form of physical expansion or restlessness. The intensity of particular symptoms can change depending on the situation in which the child currently finds him- or herself. Nevertheless, it remains disproportionate to their age, developmental level and it influences negatively the child's functioning in many areas.

Apart from attention deficit, another characteristic trait of cognitive functioning of children with ADHD is the lack of thought inhibition, which can be seen in racing thoughts, jumping to conclusions, or over-fantasizing. There are also observable problems with learning from previous experiences, which are connected with disorders of operational memory and can be observed in thinking rigidity and perseverance of behaviors, i.e. repeating a given way of thinking or given behaviors despite the information that they are wrong. The ability to plan is also affected, both in respect of complex actions with a complicated sequence and simple activities. In terms of emotional functioning of children with ADHD, problems with emotional regulation are observed, which result in big liability of emotions and an increased emotional reactivity. What is more, children with this disorder face many problems with social functioning, which means that they are not liked and accepted by their peers and can rarely form satisfactory social relations.

Formal diagnosis of ADHD is symptomatic and relies on criteria described in medical classifications of diseases and health problems, such as ICD-10 (2000) or

DSM-5 (2013). These classifications, however, differ quite significantly from each other. In DSM-5 (2013), the neurodevelopmental character of this disorder is recognized as well as its heterogeneity, reflected in the possibility of diagnosing three subtypes of ADHD. According to ICD-10 (2000), one can only diagnose hyperkinetic disorders, which can correspond to the mixed type of ADHD. Such a definition leads to underestimation of symptoms and leaving out children with the remaining subtypes, who do not receive the correct diagnosis and, as a result, will not be able to obtain adequate help, although their functioning will be significantly disordered (Lahey et al., 2006). Furthermore, there is no single mode of procedure which should be used in the situation when ADHD is suspected (Pelham, Fabiano, Massetti, 2005). Many estimators scales which are considered useful tools to assess the intensity of inattention and impulsiveness symptoms or secondary effects of their existence are not available in Poland (Pelham, Fabiano, Massetti, 2005; Świącicka, 2011).

One can also encounter opinions negating the merit of diagnosing disorders with attention deficit and hyperactivity due to the small specificity of the symptoms and a high frequency of such problems among children diagnosed with different disorders (Faraone, 2005). Their correctness is undermined by the data pointing to the neurobiological conditioning of ADHD. According to the current state of knowledge, the reason for the existence of the symptoms triad is a problem on the biochemical and structural level of some structures of the nervous system – prefrontal cortex, base nuclei, cerebellum and corpus callosum (Pisula, 2003). These are determined by the genetic material, whose expression is modified by environmental factors (Borkowska, 2006; Dickstein et al., 2006; Wolańczyk, Komender, 2007).

The list of environmental factors which can be connected with the onset of ADHD symptoms is long and it includes, among others, traumatic events. There are also theories which refer to the etiology of attention deficit and hyperactivity disorders and which combine knowledge about the impact of traumatic events with information on neurobiology mechanisms (Kenny, Lane, 1997; Orford, 1998; Perry et al., 1995). The starting point for this line of reasoning was the interest in the similarities between symptoms of ADHD and symptoms occurring as a result of trauma – the need for fast reactions and acting, the need to remain in a state of constant readiness, awaiting danger, or the inability to concentrate on matters other than one's own security. Observations combined with information on the creation and development of the neuronal network and the brain led researchers to put forward a hypothesis. According to this hypothesis, some children experience trauma in the critical period for the formation of emotional regulation and control capabilities in infancy, which results in the shaping of an automatic, habituation-driven reaction to the environment which is constantly perceived as potentially dangerous.

At an older age, childhood experiences in this group of children are manifested in increased sensitiveness to danger as well as constant readiness and alertness (Orford, 1998). This causes children to react very quickly, impulsively and with no reflection. Moreover, this is a reaction to an anticipated danger on which they concentrate rather than to what is happening in reality in their life. Infants can, therefore, very quickly get used to a sense of fear and anger stemming from upsetting experiences, which in the subjective perspective of parents do not have to be perceived as negative, and which can later be manifested in problems and behaviors typical of ADHD (Perry et al., 1995). This direction of thinking, however, did not gain many followers, although it stays in accordance with the contemporary understanding of the pathomechanism of

ADHD (Nigg, 2015; Nigg et al., 2005), according to which there are two paths leading to the onset of the symptoms. One is connected with deficits in cognitive control and attention. In the other, an important role is played by disorders of emotional-motivational regulation. These two ways can coexist, creating a child-specific mechanism of the symptoms onset.

ADHD is a heterogenetic disorder in terms of both the pathomechanism, symptoms and the clinical picture, which results in many diagnostic difficulties. In addition, in around 50–80% of children, ADHD coexists with other disorders, most often with other externalizing disorders, i.e. behavioral and rebellious-defiant disorders (Biederman, Newcorn, Sprich, 1991). Around 40% of children with ADHD also suffer from depressive and anxiety disorders (Drabick, Gadow, Sprafkin, 2006; Tannock, 1998). Problems with focusing attention, lack of the skill to predict consequences or react adequately – all these mean that children diagnosed with ADHD are more prone to various types of injuries or accidents than their healthy peers and these are often more serious and involve head injuries or injuries to multiple body parts (Wolańczyk, Komender, 2007). This group is more likely to experience various kinds of traffic accidents, for example during a show-off bike ride (Barkley, 2000). Persons with ADHD also more often engage in various types of risky behaviors, such as daredevil car driving, risky sexual contacts or gambling (Groen et al., 2013). Diagnosis of ADHD in childhood is a risk factor for developing addiction to alcohol, marijuana or cocaine (Molina, Pelham, 2014).

Study result also suggest that among children with ADHD, there is an increased level of family adversity, which is a source of powerful stress and negative experiences (Breux, Brown, Harvey, 2017). The presence of ADHD symptoms among children also seems to be connected with their parents using inconsistent discipline (Ellis, Nigg, 2009; Martel et al., 2012) as well as other negative parental practices, such as physical punishment or weak control (Johnston, Jassy, 2007; Johnston, Mash, 2001). Family environment can, therefore, be a source of numerous negative and stressful situations for a child with ADHD. In the light of the presented data, it seems quite obvious that people with ADHD experience traumatic events and are more prone to develop disorders occurring after traumatic stress (Cuffe, McCullough, Pumariega, 1994; Ford et al., 2000; Martinez et al., 2016; Weinstein, Staffebach, Biaggio, 2000).

DIFFERENTIATING PTSD AND ADHD

The relationship between these two disorders can have different forms, which results in numerous diagnostic problems. On the one hand, ADHD and PTSD can co-exist, which influences negatively the functioning and makes ADHD symptoms more intense. On the other hand, PTSD can be seen as a consequence of an onset of ADHD (Ford et al., 2000; Weinstein, Staffebach, Biaggio, 2000). Some symptoms, such as the attentional deficit, can be common for the both disorders, although the mechanism of their etiology, and, consequently, their therapy, can be completely different. What is more, symptoms of either disorder can mask symptoms of the other and lead to incorrect diagnosis. A majority of PTSD symptoms can be observed in people with ADHD as a result of inhibition deficits on the behavioral and cognitive level. Problems with concentration and impulse control will occur in children with disorders after traumatic stress who will have to face recurring traumatic experiences and tension

in every situation reminding of the traumatic event. Some researchers even point out that overlapping of these symptoms can be connected with deficits in executive functioning capability (Martinez et al., 2016).

Table 1 presents a preliminary description of the comparison of the two disorders prepared by the authors. It can be used as a diagnostic aid to help differentiate between the two disorders. Incorrect diagnosis or omission of the fact of the disorders co-existence can result in a mismatch of therapeutic actions and increase of the symptoms (Weinstein, Staffelbach, Biaggio, 2000).

When analyzing factors differentiating between and common for PTSD and ADHD, one should also refer to biological indices of the disorders. For instance, lack of secure attachment and confrontation with traumatic stressors can have an inhibitory influence on the brain development (Ahnert, 2010; Braun, Helmke, Bock, 2009). This mechanism is presented in Figure 1.

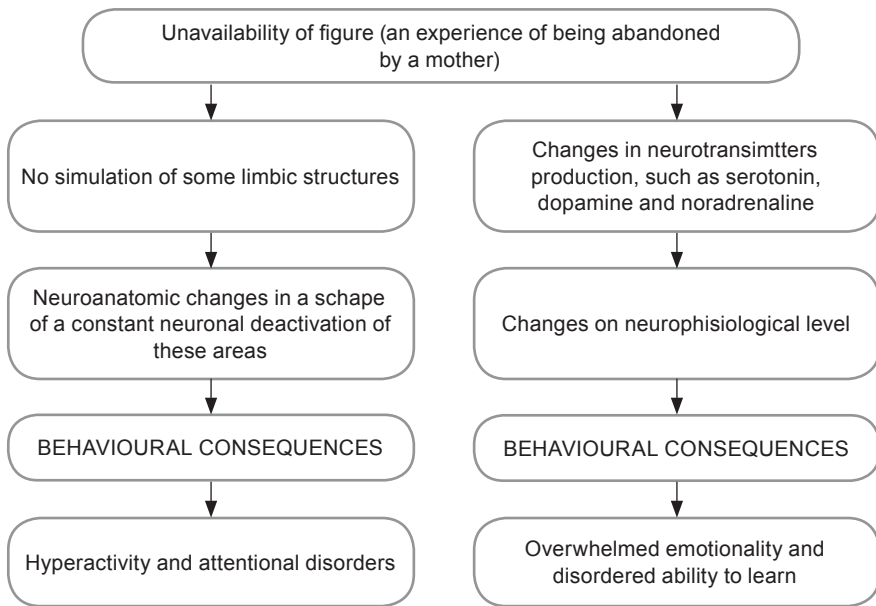


FIGURE 1. Influence of stressful experience resulting from separation from mother on a child's brain development on the basis of research according to the attachment theory. Based on Braun, Heimke, Bock, 2009

The biological basis of the negative influence of trauma on the human brain is the effect of a considerable amount of adrenal hormones (glucocorticoids) secreted during a traumatic experience which actively influence the central nervous system, triggering neurodegenerative processes and changing the brain's metabolism. Activation of the hypothalamic-pituitary-adrenal hormonal system takes place, which results in the secretion of a considerable amount of toxic cortisol and catecholamines, especially adrenaline and noradrenaline (Perry, Pollard, 1998; Perry et al., 1995). These observations are especially interesting for the analysis presented here, because the role of serotonin and catecholamines is well documented in the etiology of disorders such as depression, schizophrenia, and ADHD (Miura et al., 2008).

TABLE 1. Common and differentiating factors of PTSD and ADHD

Symptom of functional disorder	Causes	
	PTSD	ADHD
Hyperactivity	Fear of event repetition; Alertness – state of readiness; Increase in tension and irritability; Responding with fear to stimuli associated with trauma; Lowered activity of anterior part of cingulate cortex – area of the brain inhibiting amygdala and other regions responsible for response to experienced fear;	Neurobiological conditions;
Attentional disorders	Result of concentration on searching for and identifying dangers;	Neurobiological conditions (low resilience to distractors, problems with inhibition of automatic reactions);
Impulsiveness	Result of increased readiness; Defense reactions; Overreacting to stimuli associated with trauma;	Neurobiological conditions, deficits in respect of inhibition of reactions;
Anxiety	Need for security; Fear of losing a parent; Increased separation anxiety; Lowered activity of anterior part of cingulate cortex – area of the brain inhibiting amygdala and other regions responsible for response to experienced fear;	Attentional disorders – poor attention shifting, resulting in concentration on stimuli eliciting unrest, inadequate attentional strategies based on the need for protection from potential danger; Thinking rigidity and tendency to persevere connected with operational memory deficits; Increased emotional reactivity observed in quick occurrence of emotional response and its high intensity;
Aggressive behaviors	Fear of torturer; Lack of trust towards the world and people; Attempt at defending oneself; Attitude to avoid harm and ensuring one's security; Open hostility, anger, which result from lack of control over one's life;	Secondary to problems with inhibition of reactions; being result of irregularities in respect of functioning of social relations (need to dominate and control), lack of cooperation skills, reaction to rejection by social group;
Sleep disorders	Nightmares (not only about event content) as symptom of reliving; Difficulties falling asleep and restless sleep as alertness symptom;	Possible difficulties with falling asleep connected with intensified level of motor and emotional system arousal;
Problems with learning	Brain partially limits cognitive-developmental functions and focuses on survival function; Intrusive imaginations of negative event result in increased activation of neural	They are divided into two groups: (1) Problems connected with mastering taught material and using gained knowledge resulting from attentional deficits,

Symptom of functional disorder	Causes	
	PTSD	ADHD
	networks guaranteeing survival in a difficult situation or when facing fear of its repetition, which can be seen in restricted capability of information processing and/or lack of absorption of data not related to current task;	operational memory deficits, sluggish cognitive tempo and difficulties with planning; (2) problems connected with functioning as a student resulting from difficulties in abiding by the rules at school and problems with social functioning;
Lowered affect	Dominant; Caused by intrusive imagining of negative event; Result of anxiety of repeated trauma, loss of security; Modified metabolism in brain structures engaged in perception of danger (limbic system);	Secondary problem with respect to ADHD, caused by success need frustration, inability to find oneself in peer group, concentration on failures, difficulties with developing a coherent picture of oneself; Result of coexisting depressive disorders;
Isolating oneself	Struggle to avoid situations associated with negative experience; Fear of trauma repetition; Sense of stigmatizing; Sense of loneliness;	Observed in children with the ADHD subtype with prevalent attentional deficits, who seem absent-minded, daydreaming, having difficulties understanding social situations and, therefore, adopting role of child omitted/ ignored by others;
Withdrawal from relationships	Avoiding persons, objects, places associated with the event; Constant lack of trust; Ineffective attempts at self-defense;	Results from difficulties in initiating and sustaining stable and deep social relations, despite will and need to be in touch with other people;
Regress	Loss of previous capacities (nocturnal enuresis, separation fears) following from high stress	Can be mistaken for problems with reaching subsequent developmental 'milestones';
Somatic symptoms	Headaches; Stomachaches; Gynecological pains; Sometimes lack of control over physiological reactions can be observed, e.g., wetting oneself; Conversion symptoms;	Increased susceptibility to health issues, which is also observed in children with psychiatric disorders, more frequent experience of injuries (burns, accidental poisonings, cuts, head injuries, bruises, road accidents during cycling);
Low self-esteem	Sense of low self-esteem through experiencing one's own or guardian's helplessness; Loss of omnipotence; Sense of helplessness in a given situation; Shame, sense of guilt; Low opinion about one's own capabilities;	Effect of: lack of achievements, external locus of control and lack of sense of one's own effectiveness, problems with planning and incapability to finish tasks;

Symptom of functional disorder	Causes	
	PTSD	ADHD
Changes in awareness	Amnesia or hypermnesia; Temporary states of dissociation up to multiple personality disorder and psychotic states (in extreme cases, hallucinations and delusions can occur); Depersonalization/derealization; Traumatic experience reminiscences;	Do not occur;

Based on: APA, 2013; Barkley, 2000, 2006; Borkowska, 2006; Braun, Heimke, Bock, 2009; Cuffe et al., 1994; Martinez et al., 2016; Perry et al., 1995; Pynoos, Nader, 1989; Terr, 1983; Weinstein, Staffebach, Biaggio, 2000; Wolańczyk, Komender, 2007.

The nervous system changes and develops in response to repetitive patterns of neuronal activation. According to the principle of utility, states of panic and fright in a traumatic situation result in the modification of brain structures, followed by mobilization and activation of systems in the whole brain (cortex, limbic system, midbrain, areas of the pons and medulla) (Perry, Pollard, 1998; Pynoos, Nader, 1989; Schwartz, Kowalski, 1991; Schwarz, Perry, 1994; Terr, 1983). Elements of traumatic experiences are, therefore, maintained in the systems: cognitive, motor, emotional as well as in the regulation of the 'state', creating together the memory of the chronic injury.

Some structures undergo a complete change under the influence of extreme stress. This is the case for hippocampus, a very important structure responsible not only for memory and learning, but also for affect and emotions. Under the influence of traumatic events, its capacity can be reduced. Traumatic events also contribute to disorders of the integration of the two hemispheres. On the other hand, ADHD is a neurodevelopmental disorder which results from an incorrect pattern of the brain development (conditioned both constitutionally and environmentally). As mentioned before, the disorders are both structural and metabolic and affect the areas of frontal lobes, base nuclei, cerebellum and corpus callosum. The data on the neurobiological conditioning of each disorder are not taken into consideration due to the symptomatic character of the diagnosis; yet, it appears that they could be used as a clue for differentiation. Table 1 presents an example of differentiation between ADHD, considering symptoms of functional disorders of a child, depending on whether we are talking about disorders after a traumatic stress or disorders of psycho-motor hyperactivity.

SUMMARY AND CONCLUSIONS

There are many common factors for both disorders, however the basic difference lies in the etiology. In the case of PTSD, let us use a quotation: "All childhood injuries come from the outside, none of them is created solely inside child's mind (...) a trauma starts with an event outside a child, but with the moment of this event there are many changes happening inside a child" (Terr, 1995, p. 303). In the case of ADHD, we can talk about a change of particular areas of the nervous system on the structural and biochemical level as the basic cause. A problem stems from the fact that parents, teachers and even psychologists and pedagogues observe effects and not the causes, which results in such a high number of mistaken diagnoses, overinterpretations, over-

estimations or underestimations of symptoms of one or the other disorder. We should remember that underestimation of trauma can be a risk factor for many forms of disorders of the functioning of the person experiencing the trauma: sense of loneliness and social isolation, sense of guilt, auto-destructive behaviors, sense of harm, reinforcement of degenerated cognitive belief schemas, initiating dangerous relationships, development and persistence of mental health disorders and somatic disorders, as well as PTSD. It is especially important in the case of childhood trauma.

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