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Is it possible to protect against the damage of adverse childhood experiences?

Proteger dos prejuízos das experiências adversas na infância é possível?

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ABSTRACT

Starting from an empirical concern of the professional experience, the author undertakes a bibiographical review to understand the consequences for the biopsychosocial development of children and adolescents of adverse experiences in childhood - EAI, pointed out by Felitti et al. (1998) as extending to all segments of the population. From this bibliographic review, the initial hypothesis of the correlation between the quality and intensity of lived experiences (positive or negative), especially in childhood, and the process of healthy integral development of this being was based. The studies pointed out that the experience of traumatic events in the first years of life, with special attention to the family context, can negatively impact the development of children and adolescents in their emotional, behavioral, cognitive, social and physical functioning. Would it be possible, then, to avoid the losses of these IACs? Based on the researches reviewed, the author goes on to list which factors could be considered risk or protective for the occurrence of IAE, highlighting as effectively protective: stable family environment, supportive family relationships and personality traits that reinforce social skills. The studies also suggested that promoting public policies to support families, of a preventive and articulated nature, proved to be more effective in avoiding or mitigating the effects of IACs, by strengthening protective factors. Therefore, these factors have been pointed out as contributors to some degree with the probability of preserving the child/adolescent to experience IAS and/or to attenuate the effect of the consequences, relieving the suffering common in these experiences. For this reason, interventions in this sense are on the international agenda of governmental organizations references for coping with IACs.

Keywords: Adverse experiences in childhood, Risk and protective factors for childhood, Consequences of child abuse and neglect, Child protection, Developmental psychology.

1 INTRODUCTION

This article is the product of the research process for the author's Master's thesis[1], whose object of analysis arose from her professional performance as a social worker of the Judiciary, with the families in the Childhood Court and Family Court. In this practice, she observed children and adolescents experiencing suffering with their families of origin or in the experience of breaking family ties in the host institutions, which presented impairment in their integral

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biopsychosocial development. Faced with this finding, the question arose: what is the relationship between the experience of adverse experiences in childhood and the integral and healthy development of a child and/or adolescent?

He then devoted himself to the study of the repercussions of adverse experiences in childhood and their relationship with the integral and healthy development of a child or adolescent. A complete bibliographic review addressing these aspects was published in a previous article of the same authorship (Carvalho, 2023), whose fundamental elements to the reader's understanding were condensed in the present work.

In a contribution to interventions in this problem, it focused on which factors could be evidenced as protective or risk for the occurrence of these potentially traumatic situations, in the light of the reviewed research, in order to contribute with reflections and possible effective strategies for the protection and promotion of full child development.

2 METHODOLOGY

Starting from the study considered seminal by Felitti et al. (1998), and official North American platforms of study and monitoring for disease control and prevention, linked to government departments, responsible for coping with occurrences of maltreatment in childhood, several areas of knowledge interconnected to the theme were traversed. (It should be noted that the study by Felitti et al. (1998) is pointed out as seminal of the theme in the referred official monitoring platforms, as well as, it was not found in the "Google Scholar" Platform or in the "Capes Periódicos" previous study about the "adverse experiences in childhood").

A literature review was then carried out in order to contribute to the definition of what is ACE (*Adverse Experiences in Childhood*), in this article translated as EAI (*Adverse Experiences in Childhood*), because it is the most common form in the texts studied translated into Portuguese. Once the international relevance of the theme was verified, national information was sought, through official government and research platforms, dedicated to adverse experiences in childhood-EAI, including the platform "Google Scholar" and "Capes periódicos", delimiting studies related to "adverse experiences in childhood" after 2016.

In a non-exhaustive way, the intention was to bring subsidies for the condensation and increase of some reflections that point to the relevance of the subject, especially how adverse experiences in childhood negatively impact the biopsychosocial development of children and adolescents and what are the related protection and risk factors, which can contribute to the work of the protection network for children and adolescents in Brazil. For a deeper understanding of the

neurobiological developments and mechanisms activated in situations of threat and/or sensory deprivation resulting from IACs, see a previous published article (Carvalho, 2023).

3 RESULTS

From this bibliographic review, the initial hypothesis of the correlation between the quality and intensity of lived experiences (positive or negative), especially in childhood, and the process of healthy integral development of this being was based. That is, they corroborated the empirical observation that the experience of traumatic events in the first years of life, with special attention to the family context, can negatively impact the development of children and adolescents in their emotional, behavioral, cognitive, social and physical functioning.

Therefore, experiencing experiences of maltreatment in childhood, according to Pollak, (2004; cited by MacMillan, 2011), is related to problems in the regulation of emotion and stress, such as depression, anxiety, drug abuse, but also involvement with crime, health problems in adult life related to the most frequent causes of death, as well as other forms of poorly regulated emotional behavior. In addition to the consequences in the integral health of the individual throughout his life, because they safeguard a significantly higher probability relationship for the development of the main diseases responsible for deaths, in the socio-territorial contexts portrayed, as well as on a global scale, according to the WHO (Brasil, 2021).

Given the severity and scope resulting from the IAS, several governmental organizations have directed their focus of action on the protective factors that contribute to some degree with the probability of preserving the child/adolescent to experience IAS (reducing risk factors), and/or attenuating the effect of the consequences, relieving the suffering common in these experiences, which is why studies point out the importance of interventions aimed at strengthening these, in any situation.

From these studies, Nelson III (2014) relates three protective factors that were best characterized as effectively protective: "stable family environment, supportive family relationships, and personality traits that reinforced social skills" (Afifi and MacMillan, 2011; cited by Nelson, 2014, p. 42).

4 ADVERSE EXPERIENCES IN CHILDHOOD AND THEIR RELATIONSHIP WITH THE BIOPSYCHOSOCIAL DEVELOPMENT OF THE CHILD/ADOLESCENT

Several areas of knowledge, including Neuroscience, Molecular Biology, Developmental Psychology and Social and Behavioral Sciences, have been dedicated to studying the implications

of the interrelational environment of the child, with emphasis on the family context, in its process of healthy integral development, involving biopsychosocial aspects[2].

In particular, Epigenetics and Developmental Psychology stand out for this research work, expanding the findings related to brain neuroplasticity and[3] periods of greater vulnerability in the formation of our brain, noting that even the physical structures of the human brain can be modified by lived experiences (positive or negative), especially in childhood.

In this sense, exposure to traumatic events and/or adverse experiences in the first years of life impacts the development of children and adolescents in their emotional, behavioral, cognitive, social and physical functioning.

According to MacMillan (2011), in Encyclopedia on Early Childhood Development [ESDPI],

Child abuse is a major public health problem that affects both children and society as a whole... and can be grouped into four main categories: physical abuse, sexual abuse, emotional abuse (including exposure to domestic violence), and neglect.

> Families are the primary context in which children learn what kinds of social behaviors they should expect from others. As well as, interpreting and sending emotional signals to others. In abusing families, children are exposed to maladjusted forms of communication and emotional behavior and are given poor models of adaptive self-regulation. (pp. 5,17)

The studies analyzed in this research considered the individual in the methodological perspective of the Ecological Theory of Human Development[4], which has in the Russian psychologist Urie Bronfenbrenner one of its greatest exponents. In it, human development is the product of the genetic variables of the individual and his interaction with the environment, at the levels of systems in which he is inserted.

As highlighted above, the family is the main learning environment in childhood, which is why the experiences in this context assume extreme relevance to the theme in question.

[2] To name a few: Alarcão (2002); Correia (2018); Costa & Duarte (2000); Favero & Gois (2014); MacMillan (2011); Maia and Williams (2005); Papaya & Feldman (2013); I think & Costa (2008); Perry et al. (1995); among others.
[3] "Neuroplasticity or neural plasticity is defined as the ability of the nervous system to modify its structure and function as a result of patterns of experience" (Haase & Lacerda, 2004, p.1).
[4] This theory tells us that the development of the human being, although it depends on the biopsychological characteristics, also depends on the characteristics of the contexts in which each human being is inserted and the relationships that throughout his life he conceives ... According to this model, the family, social, economic and cultural reality function as a whole, which are articulated in a dynamic way among themselves, that is, it is the way each human being is being shaped by the different interactions that these realities have on him. Its model has levels, and these are part: the Microsystem, the Macrosystem, the Mesosystem and the Exosystem. (Brás & Ribeiro, p.1).

4.1 CHARACTERIZING ADVERSE CHILDHOOD EXPERIENCES - EAI[5]

Adverse Childhood Experiences-EAI, is the term developed by researchers Vincent Felitti, Robert Anda and their colleagues at the Centers for Disease Control and Prevention (CDC Kaiser Permanente), in their seminal study conducted from 1995 to 1997, initially involving 13,494 adults, from Kaiser Permanente's San Diego Health Appraisal Clinic in California, USA, referring to a subset of potentially traumatic experiences that occur before the age of eighteen.

The researchers of the study, from the Kaiser Center for Disease Control (CDC-Kaiser) (Felitti et al, 1998), observed, in the first phase or wave, the correlation between 7 (seven) categories of childhood adversity, occurring between the first eighteen years of life - abuse (emotional, physical and sexual), and domestic challenges (having a mother who was treated with violence; living with someone who was mentally ill; living with someone who abused alcohol or drugs; and incarceration of one family member), with ten (10) risk factors for the leading causes of death in adulthood in the United States. Statistically, they are: smoking, obesity, physical inactivity, depressed mood, suicide attempts, alcoholism, illegal drug abuse, injecting drug use, unsafe sex with many partners, and a history of sexually transmitted diseases. Subsequently, the CDC-Kaiser[6], included in the research the categories of childhood adversities related to neglect (physical and emotional) and separation/divorce of parents.

Since the publication of the aforementioned seminal study, the term ACE/EAI has been adopted to describe various lists of adversities, involving the three categories: abuse, neglect and domestic challenges (including "intimate partner violence" along with the category of "parental separation/divorce"). Some studies have added experiences of social disadvantage, such as economic hardship, homelessness, community violence, discrimination, bulling, natural disasters, refugee or war experiences, and witnessing or experiencing acts of terrorism.

The main findings of the study on ACE/EAI of the group of researchers (Felitti et al., 1998) revealed, in the first place, the expressive scope of the EAI: almost two-thirds of the participants/interviewees reported having experienced at least one, and more than one in five reported three or more IAS; with the exception that some populations are more vulnerable to IACs, due to the socioeconomic conditions of survival (involving the conditions of housing, work, leisure, education).

[5] In this article, the term *Adverse Childhood Experiences* – EAI will be used referring to the original concept *Adverses Childhood Experiences* – ACE (used in Felitti et al, 1998; Perry et al, 1995; Van der Kolk, 2014; among others), because it is the most common in the texts studied translated into Portuguese.

[6] The CDC-Kaiser maintains continuous data collection, with sociodemographic information, whose data feed into a Behavioral Risk Factors Surveillance System (BRFSS), shared among many U.S. states, in order to guide preventive public actions and policies.

They also found a "strong dose-response relationship between the number of exposures in childhood and each of the ten risk factors for the main causes of death in adults" (Felitti et al., 1998, p. 250), that is, they have a strong and cumulative impact. For people who experienced four or more IACs, some of the data that stood out the most, referring to adult life, were: 12.2 times more likely to commit suicide; 10.3 times, for injecting drug use; 7.4 times more likely to develop alcoholism; 4.6 times for depression; 3.9 for chronic bronchitis or COPD (chronic obstructive pulmonary disease); 2.2 more likely to have ischemic heart disease; 1.9 for cancer and 1.6 for diabetes; when compared with patients with zero score for IAS (Felitti et al. 1998). It was inferred, therefore, that these adverse childhood experiences can result in long-term, possibly permanent, impacts on their physical and mental health.

The lasting impacts observed from this study covered the following categories: mental health (depression, anxiety, suicide, post-traumatic stress disorder (PTSD); injuries (brain trauma, injuries, fractures, burns); maternal health (involuntary pregnancy, pregnancy complications, fetal death); infectious diseases (HIV, sexually transmitted diseases - STDs); chronic diseases (cancer, diabetes); risk behaviors (alcohol and drug abuse, unsafe sex); compromised life opportunities (education, occupation/work, income).

The results presented in the CDC-Kaiser Study are in line with several subsequent international studies, numerically highlighted the North American ones[7], whose high prevalence of adverse childhood experiences in the population has been correlated with a greater propensity to risk behaviors and impacts on health conditions, opportunities for life and consequent lower economic productivity in adult life, as well as the longer the exposure time, the greater the neuropsychic disorders and deleterious effects perpetrated:

> Evidence from research in neurobiology and epidemiology suggests that these adverse experiences early in life cause long-term changes in experiences of various brain systems. Worse, the increasing frequencies of adverse childhood experiences in a child's life are highly correlated with long-lasting brain dysfunction and are also linked to harmful effects on health and quality of life. (Anda et al., 2006; cited by Gaskill & Perry, 2012, p. 29.)

Experiencing experiences of maltreatment in childhood, according to Nelson III (2014) and Pollak, (2004; cited by MacMillan, 2011), is related to problems in the regulation of emotion and stress, such as depression, anxiety, drug abuse, but also, involvement with crime and situations of

[7] Entre elas: Bick & Nelson (2016); Gaskill & Perry (2012); Kendall-Tackett (2012); MacMillan (2011); Nelson III (2014); Perry et al. (1995); Perry (2005); Schaefer et al. (2016); Van der Kolk (2014).

violence, health problems in adult life associated with the most frequent causes of death, as well as other forms of poorly regulated emotional behavior.

And, for Silva (2016), there is also the possibility of learning by observation/imitation/modeling of the patterns of violent behaviors of their caregivers/parents and reproduction of the cycle of violence. The author argues, based on the Social Learning Theory, that the child, when exposed to a family context with domestic violence, tends to perceive aggression as an appropriate way to manage stress, resolve conflicts or gain control; and, therefore, may be deprived of the opportunity to learn in these primary social relations positive methods of conflict resolution, based on effective communication, negotiation, verbal argumentation, active listening, and self-control tactics.

Among the stressors of the family environment that drive adverse experiences in childhood, violent intrafamily conflicts are also highlighted, responsible for a marked level of disorganization in the child, according to Kitzmann (2007; cited by MacMillan, 2011) similar to the experience of direct physical abuse against him (p.73). The author also reports the existence of growing evidence of the correlation between exposure to domestic violence and the development of psychosocial and academic problems.

In this same direction, the results obtained in the coordinated studies by the Committee on Child Maltreatment Research, Policy and Practice for the Next Decade (Nelson III, 2014) corroborate, which prove that these consequences are not limited to the present of the child and his age group, but in:

> ... increased risk for a range of problematic developmental, health, and mental health consequences, including learning problems (e.g., problems with inattention and impairments in executive functions), peer-related problems (e.g., peer rejection), internalization symptoms (e.g., depression, anxiety), externalization symptoms (e.g., oppositional defiant disorder, conduct disorder, aggression) and post-traumatic stress disorder (PTSD).[8] (p.3)

With the increase in PTSD, the deleterious consequences of lived experiences are accentuated due to the triggering of biopsiological dysfunctions that, among them, Kendall-Tackett (2012) highlights, singularly, chronic pain syndromes (fibromyalgia and irritable bowel syndrome, are the most frequent in cases of abuse), chronic fatigue syndrome and multiple chemical sensitivity. Schaefer et al. (2016), point out that the effects of PTSD can also "promote

[8] For symptoms characteristic of PTSD, see American Psychiatric Association-APA (2014; cited by Schaefer et al., 2016).

or inhibit the functional maturation of neural structures responsible for cognitive processing, as well as neurobiological circuits involved in the endocrine and immune response to stress" (p.113).

According to the results of the "Adverse Childhood Experiences – ACE" study, a term translated by the author (Nelson III, 2014) as Adverse Childhood Experiences, there is also a higher risk for "liver disease, lung cancer and ischemic heart disease among adults who report several adverse childhood experiences" (Brown and others, 2010; Dong and others, 2003; Dong and others, 2004; cited by Nelson III, 2014, p. 35).

Also pointed out by Nelson III (2014) were studies that suggested a correlation between the experience of toxic stress[9], which affects the regulation of the hypothalamic-pituitary-adrenal (HPA) axis, and the occurrence of shortening of the "telomeres", which are the protective ends of the chromosomes, in the DNA. These structures shrink every time cells divide, a phenomenon commonly related to aging but also to stress (Nelson III, 2014; Papaya & Feldman, 2013). Studies pointed out by Nelson III (2014) indicated that children exposed to neglect and institutionalized children had shorter telomeres.

The results evidenced by the groups of researchers on the EAI (Felitti et al., 1998) of the influence of the environment in determining the conditions of development of the individual, find theoretical foundation, according to Costa (2018) in the perspective of "epigenetic processes". Costa (2018) explains that "the term epigenetics refers to the alteration in gene expression without modifying the sequence in DNA, that is, by activation (expression) or inhibition (silencing) of the expression of a gene" (p. 56), arising from the interaction of our genetic nature with external environmental factors. Thus, through modifications in gene expression, external stimuli from the environment (or lack thereof) can shape behavior, preferences, and abilities.

According to experimental studies with rats, by Roth et al. (2009; cited by Alves, 2020), it was found that, through epigenetics, the transgenerational transfer of anxious and depressive behaviors can also occur, and may even affect the next generations with the positive or deleterious effects of the experiences.

Bick and Nelson (2016), Costa (2018), Gaskill and Perry (2012), MacMillan (2011), Papaia and Feldman (2013), Perry et al, (1995), Shonkoff (2011), among others, share Costa (2018) in considering that brain development occurs through the interaction of individual genetic characteristics with life experiences, and on it will depend everything we will become. To this "ability of the nervous system to modify itself in response to fluctuations in neural activity (by

[9] Toxic stress defined as prolonged, uninterrupted or repetitive stress, which occurs in cases of mistreatment, abuse or neglect (NCPI, 2016).

internal and/or external stimuli)", Costa (2018) calls "plasticity or neuroplasticity". Papaia and Feldman (2013) add that learning is made possible by this brain capacity.

It is noteworthy that due to this neuroplasticity, the human brain can be affected/modeled positively or negatively, depending on the quality of sensory experiences, or by their absence, especially in early childhood, a period that goes from birth to six years of age. Studies (NCPI, 2016; Nelson III, 2014; Papaya & Feldman, 2013; Perry et al., 1995; Perry, 2005, Shonkoff, 2011 and 2012) point out this age group as being a sensitive period for the development of various skills due to the high brain plasticity characteristic of this phase (especially the first twenty-four months), at a higher level than any other in life. In it, the brain is more sensitive to stimuli and experiences, when the fundamental skills are developed for the development of other more complex ones in the following phases, such as the executive functions, attributed to the cortical region, whose full functionality is reached at puberty.

5 ACTIVATION MECHANISM AND CONSEQUENCES FOR DEVELOPMENT

Gaskill and Perry (2012) describe the process of development of the human brain, from uterine life, dividing it into three regions, each responsible for a set of functions, which are developed progressively and hierarchically, making its functions at each stage more sophisticated and efficient. The first, lower brain regions, formed by the brainstem and diencephalon, begins its development in the maternal uterus and reaches functionality before preschool, responsible for the functions linked to survival, as they control basic life support functions: breathing, heart rate, blood, pressure, among others. The higher brain regions, responsible for the complex functions, whose full functionality is reached at puberty, include the limbic regions, especially the amygdala, which exert the function of emotional regulation, attachment and regulation of affect; and cortical regions, which mediate the complex functions of abstract thought and cognition and complex language (Gaskill & Perry, 2012; Papaya & Feldman, 2013; Perry et al. 1995).

"Ultimately, it is the human brain that processes and internalizes traumatic (and therapeutic) experiences. It is the brain that mediates all emotional, cognitive, behavioral, social and physiological functioning" (Perry et al, 1995, p. 273).

Adverse experiences with traumatic potentiality, according to the studies consulted (Bick & Nelson, 2016; Gaskill & Perry, 2012; Perry et al., 1995; Shonkoff, 2011) activate brain regions that trigger intense emotions, markedly mobilize the sympathetic nervous system, for a fight-or-flight adrenergic response, and, consequently, decrease the activation of all non-critical functions, "involved in the integration of sensory input, attention, memory, memory consolidation,

modulation of physiological arousal, and the ability to communicate with words" (Van der Kolk, 1994; quoted by Gaskill & Perry, 2012, p.30).

Van der Kolk (2006; cited by Gaskill & Perry, 2012) states that nearly two-thirds of children who experience trauma have symptoms of increased adrenergic activity. Among the reported symptoms of the physiological responses involved are: increased heart rate, blood pressure, breathing, release of stored sugar, increased muscle tone, stimulated sweat glands, inhibition of gastrointestinal processes, anxiety, or feeling of hypervigilance, (Gaskill & Perry, 2012; Perry et al., 1995). "Finally, such intense responses to stressful experiences diminish the child's ability to organize a modulated reaction behavior and be engaged in the present" (Hooper et al., 2006; Perry, 2008; Van der Kolk, 2006; cited by Gaskill & Perry, 2012, p.30).

In addition to the activation of the sympathetic nervous system, in materializing the threat, a complete response is triggered involving a complex set of interactive processes, which include the activation of the centrally controlled peripheral autonomic nervous system, the immune system, the hypothalamic-pituitary axis, with a concomitant peripheral release of adrenocorticotropic hormone and cortisol, and other neural stress response systems in the brain (Perry et al., 1995).

With the frequent or continuous activation of this "alarm system", Nelson III (2014) points out the essential neurobiological systems whose activity undergoes changes as a result of exposure to adverse experiences in early life:

> ... the hypothalamic-pituitary-adrenal (HPA) axis of the stress response system; the amygdala, involved in emotion processing and emotional control; the hippocampus, involved in learning and memory; the corpus callosum, involved in the integration of functions between the hemispheres; and the prefrontal cortex, involved in higher-order cognitive functions (p.9).

As seen, brain activities react to stimuli that are identified from previous experiences, the repetition of which modifies the neuronal connections which is understood as "use-dependent activity or process", through which learning and memories are created (Perry + Hambrick, 2008; cited by Gaskill & Perry, 2012; Shonkoff, 2011 and 2012). In cases of repeated exposure to adverse and traumatic experiences, this system will be reactivated with each reminder of the event, autonomously and at progressive levels of sensitization, either through a simple memory of the event, dream, or some stimulus that refers the child to the event. Thus, despite no longer being in a situation of threat or the original trauma, the stress response and reaction system of the child's brain is repeatedly activated.

> This activation dependent on the use of these areas leads to sensitization, and sensitization of catecholamine systems ... leads to a cascade of associated functional changes in brain-related functions... The brain regions involved in the threat-induced hyperarousal response play a critical role in regulating arousal, alertness, affect, irritability, locomotion, attention, stress response, sleep, and startle response. Because the brain areas involved in the acute stress response also mediate a variety of other functions, sensitization of these systems by repetitive repetition of a traumatic event leads to dysregulation of these functions (Perry et al., 1995, pp. 277, 278, translation and emphasis added).

Thus, the child, who has been exposed to traumatic situations, may present behavioral changes (motor hyperactivity, anxiety, behavioral impulsivity, sleep problems), neuroendocrine abnormalities, and, in the long term, emotional, behavioral, cognitive problems and alteration in the fear response system itself, becoming "*hyperreactive and excessively sensitive*" (Perry et al., 1995, p. 278), because the child remains in a "state of *persistent* fear ..., this means that the child will very easily pass from a mild anxiety to a sense of threat or terror" (Ibid., p. 278).

Nelson III (2014) also presents works pointing out functional changes in the prefrontal cortex and associated brain regions, resulting from changes in the regulation of inhibitory control, derived from experiences of abuse and neglect in the childhood phase.

Unfortunately, the symptomatology resulting from traumatic experiences (anxiety, depression and behavioral impulsivity) find similarity with other disorders and psychopathologies, as pointed out by Perry (2003) and Van del Kolk, (2014). The authors highlight the relevance of considering possible previous experience of traumatic situations and the central changes that were reflected during the diagnostic evaluation by health professionals as a preventive measure of misdiagnoses, such as cases reported on ADHD (attention deficit hyperactivity disorder), anxiety disorder, conduct disorder, The same in relation to health problems in adulthood, whose origin may be related to previous traumatic experiences in childhood and which tend not to be considered (Harris, 2014).

Perry et al. (1995), confirms this hypothesis that children who have gone through traumatic experiences may have their behavior or symptom confused with various psychopathologies, by explaining that

> ... In the face of persistent threat and, depending on the child's age and the nature of the threat, the child will move along the hyperarousal continuum (the child's version of "fight or flight") or the dissociative continuum[10]. A first reaction to the continuing threat may be to freeze. ... Children who have been traumatized and have developed a "sensitized" hyperarousal or a "sensitized" dissociative pattern often use this freezing mechanism when they feel anxious. This is often labeled oppositional defiant behavior (p. 279).

[10] *Dissociative continuum* or dissociation, according to the author, is "simply detaching oneself from the stimuli of the external world and attending to an 'internal' world. Daydreaming, fantasy, depersonalization, derealization, and states of escape are examples of dissociation" (Perry et al., 1995, p. 280).

When these children, who have developed the dissociative pattern as a response to stress, find themselves in a situation of deep anxiety due to some unconscious evocative stimulus, Perry et al. (1995) state that they "tend to feel a little out of control and will freeze cognitively (and often physically)" (p. 280, our translation), due to feeling threatened and/or terrified, being misinterpreted by adults.

While exposure to situations of abuse (emotional, physical, sexual) activates the brain's response to the "threat", considering that the neural development architecture of a child is still incomplete and that his brain is much more sensitive and malleable to experiences than that of an adult, the experience of deprivation of critical experiences, in situations of physical and emotional neglect, is pointed out by scholars with even more damaging potential for brain organization:

> Deprivation of critical experiences during development may be the most destructive and least understood area of child maltreatment. Unlike broken bones, the irreversible final development of the brain areas mediating empathy resulting from emotional neglect in childhood is not easily observable (Perry et al., 1995, p. 276).

In sensitive and critical periods of development, when different areas of the central nervous system are organizing, the deficiency of stimulation to the neural systems can result in the impossibility of formation or destruction of neurons, which can become permanent (Gaskill & Perry, 2012; Papaya & Feldman, 2013; Shonkoff, 2011), resulting in a poorly developed brain (with deficits in neurodevelopment) and disorganized functioning, in which the child may manifest less intellectual, verbal or emotional capacity to respond to experiences.

In this period, Perry et al. (1995) reinforces, extremes of sensory deprivation, such as the lack of (positive) attachment experiences early in life, can result in impacts on use-dependent neurodevelopment, causing "disorganization and impaired function in brain-mediated functions such as mood, empathy, attachment, and affect regulation" (p. 276). Nelson III (2014), in the same direction, when reporting psychosocial and behavioral consequences resulting from IACs, in addition to those described by Perry et al. (1995), highlights the correlation between the development of an "insecure pattern" or "disorganized" attachment (Casullo & Fernández Liporace, 2004; Mendes & Rocha, 2016) and the experience of abuse and neglect, especially when in early childhood.

According to Nelson III (2014), Papaia and Feldman (2013), Perry (2008; cited by Gaskill & Perry, 2012), and Shonkoff (2011), from the neurobiological point of view, adverse and traumatic experiences in childhood, prolonged and in excess, alter the pattern of functioning and regulation of various body systems, and may result in new dysfunctional brain patterns, influencing and compromising functions of higher brain areas, and, subsequently,

psychopathologies. He also points out that, due to the special developmental condition of the child, experiences become the "neural architecture" of the infant brain, which, the younger, the more vulnerable to trauma.

Dr. Harris[11] (2014), summarizes:

> Now, we understand better than we ever could before, how exposure to early adversity affects the brains and bodies of developing children. It affects areas such as the *nucleus accumbens*, the pleasure and reward center of the brain that is involved in substance dependence. It inhibits the prefrontal cortex, which is necessary for impulse control and executive functions such as judgment, and is also a critical area for learning. And on MRI scans, we see measurable differences in the amygdala, the brain's fear response center. So there are real neurological reasons why people exposed to high doses of adversity are more likely to engage in high-risk behaviors, and that's important to know. ... Children are especially sensitive to this repeated activation of stress because their brains and bodies are just developing. High doses of adversity not only affect the structure and function of the brain, which in turn affects the developing immune system, which ultimately complicates the development of hormonal systems and even the way DNA is read and transcribed.

That is, the deleterious effects of the traumatic situations experienced, by affecting the way "DNA is read and transcribed", through epigenetic processes, may result in transmission of health problems between generations (Shonkoff, 2012).

Bick and Nelson (2016), Gaskill & Perry (2012), Nelson III (2014) and Perry et al (1995) highlight the heterogeneity in the results of the changes in neurodevelopment pointed out in their works, which, according to them, may be the result of the correlation of a set of factors, individual and environmental, that can contribute as protective or aggravating of risk, which will be addressed in the sequence.

In view of the findings of the studies presented, international organizations have joined efforts in the elaboration of policies and interventional actions of a protective nature, as a strategy to face this public health problem. In this sense, it is urgent to know the factors that can be considered risk or protection to child development, which would be correlated with the negative repercussions of IAS.

6 RISK AND PROTECTIVE FACTORS FOR CHILD DEVELOPMENT

There is a consensus, in the literature consulted, of the heterogeneity of the response to negative and traumatic stimuli of exposure to IAE, with significant variations from one

[11] Dr. Nadine B. Harris is a pediatrician in charge of the Office of Child Abuse Prevention-OCAP, an arm of the California Department of Social Services, with an outstanding track record of leadership in recognizing the significant impact of IACs on a child's development, health, and life trajectory.

child/adolescent to another, which would be related, as presented, to the interaction of positive and negative influences, individual, family and broader social. According to the researched studies, the individual response to a given adverse situation will depend on the correlation of these endogenous and exogenous factors, which is why the same event can have a traumatic effect for one individual and not for the other.

The studies of Nelson III (2014) on the consequences of experiencing IAS also found a positive association between the number of risk factors for IAC that a child is exposed to and the probability of occurrence of the deleterious effects of this event. Thus, given these effects on the biopsychosocial development of the individual and the final social and financial cost ($ 80.3 billion each year in the USA, according to Gelles and Periman [2012; cited by Nelson III, 2014]), the relevance of increasing strategies to cope with this public health problem is highlighted, especially with protective interventions.

Therefore, they are based on the factors that the studies indicated association with the occurrence of adverse situations in childhood, making it urgent to know those who can be considered at risk or protective to child development and that would be correlated with the negative repercussions of IAS.

For a systematic exposition focused on the factors that need to be observed in the care of families and children/adolescents, a survey was conducted from the literature consulted, [12]which will be divided into risk factors and protective factors.

6.1 RISK FACTORS

According to the cited literature, several environmental factors are correlated with risk probabilities both for the occurrence and for the aggravation of the consequences of adverse situations, with cumulative effect, among them:

6.1.1 In the family context

Among the **prevalent configurations and situations, families stood out**: based on an unequal distribution of authority and power; in which there is no differentiation of roles, leading to the erasure of boundaries between members; with a level of permanent tension, manifested by difficulties in dialogue, lack of control of aggressiveness and other antisocial behaviors; with incidence of environmental stress and stressful life events (any change in the environment that

[12] Brazil (2002); Coêlho et al. (2016); Goodyear-Brown et al. (2012); Khoury et al. (2020); MacMillan (2011); Maia & Williams (2005); NCPI (2016); Nelson III (2014); Papaya & Feldman (2013); Perry et al. (1995); Perry (2005); Schaefer et al. (2016); Smith (2016); Stochero et al. (2021); Waikamp & Barcellos Serralta (2018).

causes a high degree of tension); who are in a situation of crisis, losses (separation from the couple, unemployment, death, migration, etc.); in which there is no opening for external contacts (isolation); with insufficient social support network (family and community); with a low level of development of the autonomy of its members; in which there is absence or little positive manifestation of affection between father/mother/child; with environments incapable of promoting affection, safety and protection to the child; history of criminal history or use of weapons; in a situation of low socioeconomic status; with social disadvantages related to race and ethnicity; with economic/emotional dependence and low self-esteem on the part of some of its members, leading to impotence and/or failure to deal with the situation of violence; Numerous; with the absence of a parent[13] and the dissolution of the nuclear family.

Specifically**, in relation to parents/primary caregivers**, the literature consulted highlighted as a possibility of risk factors, the incidence of: low educational level; impoverished social skills; absence or insufficiency of knowledge about child development; excessively high expectations in relation to the child; delegation to the child of domestic tasks, disproportionate to their age group, or parental; limited ability to deal with situations of stress (easy loss of self-control); psychoactive substance abuse and the resulting inability to care for the child (this abuse can compromise thinking, ability, judgment, and the ability to protect); psychological/psychiatric impairment or mental disability, including maternal depression; pregnancy of adolescent parents, without psychosocial support; unplanned/denied pregnancy; and lack of prenatal care.

Elements **related to the history and personality of parents/caregivers** also showed correlation:[14] parents' memories of child attachment, which can influence the construction of their own children's attachment; the previous or multigenerational occurrence of abuse and neglect, and all modalities of intrafamily violence (physical violence, neglect, psychological violence – including exposure to interparental violence, and sexual violence); the presence of a violent family model in their origin story (maltreatment, childhood abuse and abandonment/rejection); the presence of negative styles of parental educational practices (strict, authoritarian disciplinary style); little exposure to suitable parental role models; among others.

[13] The Fourth National Study on the Incidence of Child Abuse and Neglect, (NIS-4; Sedlak et al., 2010; cited by Goodyear-Brown et al., 2012) examined family structure as a potential risk factor for child maltreatment, using data collected in 2005 and 2006. In maltreatment groups, children living with married biological parents had the lowest rate of maltreatment collectively. Children living with a single parent had eight times the incidence of maltreatment than those living with married biological parents and were ten times more likely to be abused.

[14] "Attachment is a type of bond that forms a sense of security, strictly linked to a figure of attachment, whose comfort experienced in its presence allows it to be used as a secure base, from which to explore the world" (Silva, 2016, p. 52).

Nelson III (2014) also asserts as a risk the occurrence of stress factors concomitant with the experience itself of abuse and neglect, with possible consequences that may manifest themselves at different times of the child's development.

6.1.2 In the broader context of the community:

Among the prevalent situations in the broader social context, correlated with risk probabilities for the experience of adverse situations, the following were reported: sense of approval of violence and corporal punishment/physical punishment; unequal distribution of power within the family and society; cultural expectations of the community/society; context of social violence; impact of mass media, for example, with the objectification of the physical body, the use of sexually-themed material - sexual socialization, the frequent combination of sex and aggression, child beauty pageants where young children are trained to increase their physical attractiveness, the characterization of sexual activity between boys with adult women and girls with adult men; among others.

From the above survey, referring to the environmental context, some considerations of the literature consulted could be seen in the empirical observations in the field of professional activity of this researcher.

Thus, we agree with MacMillan (2011) and ratify that child maltreatment is not exclusive to the layers of society with lower socioeconomic levels, however, "poverty and environmental stress increase the probability of its occurrence". Caregivers who need to pay attention to urgent problems or difficulties in the area of material survival and daily functioning (guaranteed income, housing problems, children too many to care for) are in a more vulnerable condition to compromise the interaction with the child and the establishment of a secure attachment system (MacMillan, 2011, p. 19)[15], for example, covered in the first part of this article. The experience of a chaotic environment in families tends to be a contributing factor to the occurrence of neglect of the child's attachment needs by their primary caregiver.

Another issue observed empirically is consistent with the notes of Kitzmann (2007; cited by MacMillan, 2011) who, of the stressors in the family environment, highlights the exposure to

[15] According to J. Bowlby (1989) creator of the Attachment Theory (AT), attachment behavior is a basic mechanism of human beings considered as a homeostatic control system inserted in other behavioral control systems, established with a primary caregiver figure, the parents, with the biological function of protection. From the quality of the interaction between the caregiver and child, an affective bond will be built, in which the cognitive and emotional capacities of the child interact, the consistency of the care procedures, the sensitivity and responsiveness of the caregivers. Children whose caregivers are more likely to develop a secure attachment pattern and are consistently responsive to their suggestions.

violent conflicts within the family, correlated with the significant probability of accentuated level of disorganization in the child and development of psychosocial and academic problems, similar to the experience of direct physical abuse against him.

The studies of Nelson III (2014) increase the theme by emphasizing the positive relationship of the quality of care of the mother and the impact on the telomeres of the children, referring to the finding of shortening in the telomeres (ends of the chromosomes in the DNA) of children whose mothers were insensitive. And, regarding the context of family socioeconomic vulnerability, they pointed out that the effects themselves, when more than five risk factors occur in this area, are comparable, according to the author's studies, to the effects of child abuse and neglect, due to the negative and compromising implications of parental functioning with significant effects on the possibility of establishing parent-child attachment.

6.1.3 Inherent to the child

6.1.3.1 Endogenous/neurobiological factors:

Of the relevant aspects for the theme discussed, inherent to neurobiological (endogenous) factors of children, the following significant correlation stood out in the literature: of evolutionary disorders; of children born with congenital malformations or chronic diseases (mental retardation, physical abnormalities, hyperactivity); of disorganized child behavior; the context of the development of the child's brain, when child abuse and/or neglect occurs (correlating to the possible negative effects exposed on the brain structures in formation); of the child/adolescent's age, because, according to the studies, the patterns of neurobiological response seem to change with age; and the cognitive meaning attributed/perceived to the event by the subject (child).

6.1.3.2 Exogenous factors

Exogenous factors correlated with the occurrence and/or worsening of the consequences of IAS were also observed, such as: children with lack of parental bond in the first years of life; children separated from their mother at birth by disease or prematurity; children/adolescents with low school performance and/or dropout; past history of stressors; the specific nature of the trauma; the presence of aggravating factors (such as the loss of the caregiver).

All the factors presented, among others, both environmental and related to the child/adolescent himself, have a cumulative and interdependent relationship with the victim's

response patterns, which supports the differentiation of the possible consequences and singular consequences of each individual pointed out in the referenced studies.

6.2 PROTECTIVE FACTORS

Continuing with the data found in the literature consulted[16], it was evidenced environmental factors correlated with probabilities of protection both for the occurrence and for the development of resilience of the child in the[17] face of stressful and traumatic events.

Considering the multifaceted complexity of the scope and correlation of factors that comprise the study of resilience, the possible protective factors have also been analyzed in ecological, endogenous and exogenous terms, assessing resilience in longitudinal studies involving childhood, adolescence and early adulthood, with the measurement of these factors psoterior to the occurrence of IAS. From these studies, Nelson III (2014) relates three protective factors that were best characterized as effectively protective: "stable family environment, supportive family relationships, and personality traits that reinforced social skills" (Afifi and MacMillan, 2011; cited by Nelson, 2014, p. 42).

In addition, all the protective factors listed below, among other possible factors, contribute to some degree with the probability of preserving the child/adolescent to experience IAS (reducing risk factors), and/or to attenuate the effect of the consequences, relieving the common suffering in these experiences, which is why studies point out the importance of interventions aimed at strengthening these, in any situation.

6.2.1 In the family context

Thus, protective factors were considered, in the family context, the **observation and/or strengthening** for the construction of: a caring, healthy and safe home environment; an environment of stable, stimulating and protective relationships that enable the construction of a solid basis for an effective learning life; family relationships permeated by expressions of affection and respect; positive changes in the family structure (for example, intervention, interruption of access rights or removal to a foster home); supportive family relationships at the time of abuse; an environment that provides enriching cognitive, emotional, social and physical experiences; family

[16] See note 11.
[17] For this work, we used the concept of resilience chosen by Nelson III (2014), who considered it as "a good result despite the high risk; maintenance of competence under tension; and recovery from trauma" (McGloin and Widom, 2001; cited by Nelson III, 2014, p. 41).

engagement in community resources and social support network; socioeconomic level compatible with family demand and its needs; among others.

Directly related **to the history and personality of parents/caregivers, the** following were listed: a parental educational style focused on positive educational practices; exposure of parents/caregivers to appropriate models of parental role; development of the capacity of parents/caregivers to face stressful situations and other regulatory social/emotional skills; knowledge about child development and parental expectations adjusted to the possibilities the son's real; economic/emotional independence, in addition to positive self-esteem; physical and mental health of parents/caregivers; maintenance of healthy marriage of married biological parents[18]; parental education in family planning and planned conception.

6.2.2 In the broader context of the community

The studies cited list as protective, in the broader context of the community, the finding and/or strengthening for the construction of: supportive relationships with people outside the family, such as teachers or other continuous support professional with the child/adolescent who suffered the abuse/neglect, and supportive relationships with colleagues in adolescence; public education in general, aimed at understanding and raising awareness about IACs (forms of prevention and action in the face of suspicion); wide dissemination of ways to access social assistance community resources in different formats; improvement of case identification methods, such as screening tools and communication between agencies/services; cultural expectations of the community/society, permeated by more peaceful instruments of coexistence, developing values such as tolerance and respect.

Evidenced the positive and cumulative correlation between a social context with more equity, better income distribution, power and social justice, and child and adolescent protection, the studies consulted also pointed out the relevance of the development of social policies aimed at supporting the family. These should, according to the authors, provide opportunities for environmental and life improvements through access to resources and multisectoral and articulated public policies (education, health, housing, job creation, culture, among others).

[18] See note 12.

6.2.3 Inherent to the child:

6.2.3.1 Endogenous/neurobiological factors

Of the aspects inherent to neurobiological (endogenous) factors of children, the following stood out in the literature consulted: the ability of the child/adolescent to build a sense of control of situations in their life and believe in their own ability to overcome difficulties; the presence of child/adolescent abilities to develop self-regulation and executive functions (planning, organization, impulse control and flexibility of cognition), which help to manage their own behavior and emotions; specific aspects of personality traits, gender (women have greater resilience than men), and age (neurobiological response patterns seem to change with age); the level of intelligence or cognitive ability, as well as their ability to relate; the specific cognitive meaning of the event for him/her; and genetic influences: 1. high levels of monoamine oxybase A decrease the propensity to develop antisocial problems; 2. The genotype can moderate sensitivity to environmental aggressions, such as maltreatment.

6.2.3.2 Exogenous factors

Finally, of the aspects inherent to factors exogenous to children, the following were highlighted in the studies studied: the experience of enriching cognitive, emotional, social and physical experiences; the specific nature of the trauma; the presence of mitigating factors (e.g., early intervention); the availability of at least one supportive, stable and caring relationship between the child and an adult important to his or her life, which may or may not be family; the formation of a secure attachment relationship with one or more primary caregivers; living in an environment permeated by tolerance, empathy and respect; in addition to a context of trust and faith or cultural traditions, which contribute as a psychic and emotional repertoire for the child to respond more effectively when exposed to stressful experiences.

Despite the factors listed, theoretically based on the referenced studies, the same authors suggest the need for further studies to broaden the understanding of neurobiological, behavioral, social and environmental mechanisms and their effects on the correlation between exposure to IAE and the resulting behavioral and neurobiological sequelae.

Considering the complexity and multiplicity of scope of the factors pointed out, it is agreed with MacMillan (2011) that intervention programs aimed at strengthening/promoting protective factors need to involve an articulated effort of various sectors and policies, particularly in living conditions with greater vulnerability, resulting in greater exposure of families to the effects of poverty, health risks and environmental conflicts. According to the author, it would be essential to

offer assistance to this group in the prenatal and postnatal periods, as well as in times of excessive stress (crises).

The studies and "Technical Packages" of the CDC-Kaiser, a reference in this theme due to the permanent work of monitoring and evaluation, corroborate with the preventive perspective of support to families, noting that the most effective strategies to avoid or mitigate the effects of IACs, involve making available (CDC, 2019): economic support to families; promotion of protective social norms against violence; ensuring a strong start in life and support for children to reach their full potential; teaching emotional skills to help parents and young people manage everyday stressful situations and manage their emotions; connecting young people to adults who provide attention; and intervention to reduce immediate and long-term damage.

Therefore, the actions and policies indicated, in general, would be articulated with a broad objective: to **effectively ensure the protection of children and adolescents**. As seen, these are in a special condition of development, composing an age group in need of special protection, whose quality contributes to developments throughout their useful life.

Contributing to the dissemination of the relevance of this theme was one of the objectives of this work, which, in a non-exhaustive way, intended to provide subsidies for the condensation and increase of some reflections on the potential negative impact of adverse experiences in childhood for the biopsychosocial development of children and adolescents. In the second part, it also presented which protective and risk factors are related, based on the scientific framework, that can contribute to the work of the protection network for children and adolescents in Brazil, contributing to inspire possible effective strategies for the protection and promotion of full child development.

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