

The Wide-Ranging Impact of Child Sexual Abuse: Utilising Neurobiology to Provide Scientific Evidence

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Received: November 19, 2017; **Accepted:** November 22, 2017; **Published:** November 27, 2017

Abstract

Child sexual abuse (CSA) is an inherently difficult issue to study. In recent years, not only men's rights groups, but also academics stated that harmful effects have been overstated in the literature and that so-called 'adult-child sex' was much less harmful than previously portrayed. It is openly argued that CSA might even be beneficial for children. Research methodology is commonly criticised in an attempt to advocate for paedophilic and hebephilic tendencies to be viewed as normal sexual orientation. This article provides evidence contrary to claims that 'adult-child sex' is harmless using neurobiological insight. Neurobiological and neuropsychological impacts of CSA victimisation have been found to be extensive. Recent scientific evidence suggests that gene activation and silencing is influenced in relation to physical and mental health implications along with health behaviour responses that transcend generations. Neurobiological research provides evidence that CSA is related to pathways associated with physical and mental health problems in adulthood as well as behavioural maladaptive coping. Therapy implications are discussed that may reverse the longterm negative impact of CSA over generations.

Keywords: Abuse; Child; Epigenetics; Intra-familial; Neurobiology; Sexual

Abbreviations: CSA: Child sexual abuse

Volume 1 Issue 5 November 2017

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Introduction

Child sexual abuse (CSA) is an inherently complex issue. Much research has been conducted, with inconsistent findings. This does not take away from the fact that CSA has been associated with multilevel and complex impairment [3]. Regardless, growing voices from men's rights groups [34] and more recently academics, have questioned the negative impact of CSA [25,28] and suggested that it may even be beneficial [10,13,23,28,33]. It is argued that, in light of these scientific findings, paedophilic and hebephilic relationships should be viewed with more tolerance, given that 'the hypothesis of damage has undeniably been contested' [25] (which was explicitly stated to include incest [23]).

Citation: Marika Guggisberg. "The Wide-Ranging Impact of Child Sexual Abuse: Utilising Neurobiology to Provide Scientific Evidence". *Current Opinions in Neurological Science* 1.5 (2017): 255-264.

Holt, Blevins, and Burkert [18] argued that people who morally, ethically and legally oppose adult-child sex pose a 'real problem'. Similarly, Ehman [13] stated that indirect harm to children is caused by a societal taboo that stigmatises children's sexuality to the point that children who desire sexual activity with adults feel guilty and shameful due to the reaction of others. 'Adult-child sex' rather than being harmful, is portrayed as a positive experience for the children. Malón [25] stated 'what could be wrong with the child receiving affectionate caresses and cuddles in return for masturbating the adult; this would even be possible with very small children'. Academic voices seem to become louder and stronger, arguing that application of principles of effective research methods do provide scientific evidence for this claim [see for example 26,28,29]. These academics call for paedophilia and hebephilia to be viewed as sexual normality [10,33] and for 'emanzipation of children' [25], which may influence public perception.

In an online survey, among 209 German-speaking men, who provided anonymous information on their moral attitudes in relation to pedohebephilia (sexual interest in children younger than 14 years of age), Jahnke and colleagues [20] found that being a father was no protective factor against permissive attitudes. Furthermore, the researchers reported that moral attitudes towards adult-child sex were related to the men's sexual interests. If men identified as pedophebephilic, they were more permissive towards 'adult-child sex' than when they identified as being attracted to postpubescent individuals. The majority of pedohebephilic men believed that adult and child sexuality are similar enough to permit a reciprocal relationship and that children did not suffer harm; some even believed that 'adult-child sex' was beneficial for the children.

Arguments such as the ones mentioned above require scientific examination that goes beyond retrospective self-report studies that have become contested. Recently, the impact of CSA has been studied in relation to neurobiological manifestations [8,36]. This is a new and important field of research strengthening arguments that CSA is by no means harmless. Contrary to claims that harmful effects have been overstated and that CSA should more accurately be labelled 'adult-child sex' [28], this review demonstrates how neurobiological evidence confirms the damaging effects of CSA.

Discussion

Child sexual abuse

CSA is an umbrella term for different forms of sexual victimisation experienced in childhood by another person, which is a criminal offence. Given the inherent difficulty to research CSA and its hidden nature, prevalence data are usually inaccurate. CSA is significantly underreported and many victim-survivors wait for years, or decades before disclosing, others may never do [4]. The Office of the Children's Commissioner estimated that only one in eight cases of CSA will ever be reported to statutory agencies.

Self-report surveys are usually considered appropriate to provide insight in crime victimisation and perpetration. However, in relation to CSA, such research has become criticised for self-report bias and methodological issues in relation to reported impact and harmfulness of CSA. Different situations, perpetrator and victim characteristics, types of abuse and duration of CSA contribute to variations reported in the literature along with methodological inconsistencies [19]. Admittedly, the many factors that influence individuals' lives are inherently complex and it will never be possible to scientifically prove causation of factors associated with CSA. However, clear evidence that used strict neurobiological research allows reliable inferences of the harmfulness of CSA.

Intra-familial CSA

CSA occurs in different contexts. Often the distinction is made between intra-familial (the abuser is a relative) and extra-familial (the abuser is someone outside of the family) CSA in an attempt to understand differences in impact. Research has consistently found that intra-familial CSA is more damaging than extra-familial CSA. Evidence suggests that the closer the relationship between the victim-survivor and perpetrator, the more severe the outcome [5]. Particularly negative outcomes have been reported of biological father-to-daughter CSA [5,32]. Some scholars argued that it is not CSA but rather the dysfunctional family environment that results in negative impacts for the child [see for example 28]. However, contrary to such arguments, Beach and colleagues [5] in their study of 155 women

who were exposed to intra-familial CSA found that it is not the negative aspects of family environment but the association with CSA that is most damaging for victim-survivors.

Research indicated that longterm negative impacts are found even in victim-survivors who were adolescents at the time of the abuse. Papalia, *et al.* [27] in a longitudinal study of 2759 medically confirmed cases of CSA reported that 'sexual abuse, particularly during adolescence (ages 12-16) years appears to be a risk factor for co-occurring adverse experiences' (p. 604). These findings directly contradict arguments that most recent CSA research defines children as younger than 14 years of age [see for example 20].

Various impacts

The literature has evidenced strong links between CSA and physical disorders [36], mental health impacts [6,8], and disruption of education including academic performance [7,11] and behavioural implications [24] not only in the shortterm but also longterm [24,27,36]. In the following, these effects will be discussed in more detail.

Physical health impacts

The extensive physical health impact of CSA has been acknowledged in the literature. This includes cardiovascular diseases, different forms of cancer, and diabetes [36]. Neurobiological differences have been established in relation to increased risk of physical health problems later in life among individuals with a history of CSA when compared to matched control groups.

CSA victimisation was found to be associated with reduced brain volumes [11]. Children and adults subjected to CSA showed abnormal neurostructural differences in areas such as the corpus callosum when compared to age-related comparison groups with no CSA histories. Adverse brain structures were found in studies using neuroimaging. Scientific explanations included biological stress responses due to elevated levels of catecholamines and cortisol that negatively affect neurons. The earlier a child was exposed to sexual abuse and the longer the CSA duration manifested, the greater the observed decrease in brain volume was [11]. Experiences of intrusive symptoms, physical hyperarousal and dissociation were found to be positively associated with disrupted brain development in childhood.

A history of CSA has been found to negatively affect the immune system [11,32]. A study of sexually abused girls found that suppressor cells were affected by biological stress responses [11]. Consequently, victim-survivors of CSA tend to be at a greater risk of developing infections and serious health problems.

Cognitive impacts

Cognitive impairments have been reported to affect individuals with a CSA history [6,11]. CSA was associated with modification of brain development and neuroplasticity resulting in neurocognitive impairment and functional ability. This includes concentration difficulties, impulsivity, memory and attention deficits. A large body of literature has documented the negative effect of CSA on children's cognitive development, which has been found to result in reduced academic performance [32].

Differences in brain structure were found among women who experienced CSA when compared to matched comparisons without a history of CSA. Studies using positron emission tomography (PET) imaging, and structural magnetic resonance imaging (MRI) found neurological impacts on cortical regions, reduced corpus callosum, grey matter volume and hippocampal volume, as well as differences in blood flow. These findings were associated with impaired neurocognitive functioning including sensory and memory responses, inability to regulate cortisol levels, a predisposition for mental health problems, dissociative experiences and deficits in executive functioning [32]. Individuals with a history of CSA often engage in various adaptive and maladaptive coping strategies in an attempt to avoid or minimise emotional triggers of the abuse.

Mental health impacts

Anxiety and depression are strongly associated with CSA [1,6,8]. Victimised individuals tend to have limited capacity to effectively regulate their emotions. Their compromised affect regulation ability may cause severe distress and result in isolation.

Suicidal ideation and recurring suicide attempts are considered symptoms associated specifically with CSA victimisation [1,6,27]. Baker [4] argued that suicidality indicated emotional pain and despair that many victim-survivors experience as a form of acute powerlessness. Suicide attempts, in relation to CSA victimisation serve the function of emotion regulation to escape intense feelings of anger and shame. Additionally, non-fatal self-harming behaviours have been found to be motivated by seeking attention and assistance from health professionals.

Behavioural impacts

Health risk behaviours as a way of coping with the effects of CSA victimisation, such as the use of alcohol and/or other drugs [1,6,27], overeating [15,24,36] and sexual behaviour problems are common [32]. Evidence of persistent disruptions of CSA well into the victim-survivor's adulthood due to neurobiologic stress response dysregulation was consistently reported. Biological stress system dysregulation as well as adverse brain development have been found to be associated with a range of health behaviours including eating and sexuality problems [11,32]. The following section discusses biological stress system dysregulation in relation to behavioural impacts of CSA.

Obesity

Eating disorders including obesity have been associated with CSA victimisation. Deliberate weight gain has been found to be used as a strategy to protect against subsequent CSA in an attempt to make the body less attractive and sexually undesirable [24]. Furthermore, victim-survivors of CSA often use 'feel good food' as a coping strategy. Comfort eating is a way of emotion regulation, which has been associated with CSA victimisation [15]. Binge eating disorders have been found to be up to four times more prevalent among individuals with a history of CSA when compared to non-abused control groups.

Trickett, *et al.* [32] in a longitudinal study found that CSA perpetrated by a biological father had the most severe outcomes in relation to weight gain when compared to other abusers of intrafamilial CSA. The researchers argued that female children abused by their biological father may experience particularly high distress (as measured by high cortisol concentration, see discussion below) and as such be disproportionately predisposed to obesity.

Obesity as a significant health problem is recognised globally. It is associated with many negative mental and physical health effects. Individuals suffering obesity often feel stigmatised in contemporary society. CSA has been found to play a key role in eating habits [30]. Individuals with a history of CSA are significantly more likely to suffer from obesity in childhood and adulthood than individuals without CSA victimisation [30,32,36]. Gustafson and Sarwer [15] argued that emotion regulation through comfort eating has an impact not only physically with increased health risk, but also on the person's neuroplasticity.

The activation of the biological stress response system is believed to be a psychobiological impact of CSA [32]. The influence of CSA on changes in biological stress systems, adverse brain development and complex interaction between health risk behaviours is important in the field of traumatology research. It indicates that behavioural dysregulation is a way of compensatory behavioural adaptation. So far, critical periods of vulnerability have been identified along with critical periods of brain development in relation to stress systems such as neuroendocrine systems, sympathetic nervous system, and the immune system.

Emotion dysregulation has been associated with avoidance behaviours. DeBellis, *et al.* [11] found that anxiogenic and anxiolytic pathways are activated through the serotonin system as a stress response mechanism. Serotonin assists in emotion regulation and behaviour regulation. Chronic stress has been found to decrease serotonin levels in the prefrontal cortex, which has been associated with

health risk behaviours including suicide attempts (see discussion above). Serotonin dysregulation has also been found to play a major role in the development of neuropsychological disorders such as anxiety, depression and PTSD.

Victim-survivors of CSA often suffer from interpersonal skills deficits [6] and ambivalent attachment, particularly if the abuser was the biological father [32]. These deficits have been related to a lack of friendship experiences in childhood including the family and school environment, which lead to underdeveloped skills in forming and maintaining adult relationships in private and work life [3,7].

Relationship impairment

CSA has been described as 'social trauma' [11]. Children and adults experience reminders of the abuse in various ways including through interaction with others. Social cues may include a person's facial expression, tone of voice, or behaviour and trigger specific symptoms such as emotional arousal. The amygdala is responsible for our ability to process social information and interpret another person's behaviours in relation to intentions [6] including the cognitive processing of fear, which has been associated with emotional intelligence [11]. There is evidence of asymmetric right/left ratio of cerebral metabolism of the anterior temporal region in individuals with CSA histories when compared to control groups [24]. These findings indicate that victim-survivors of CSA have a diminished left hemispheric differentiation, which has not been observed in individuals without CSA histories. Increased right-sided activation has been explained with trauma-related over-sensitivity to conditioned stimuli due to 'traumatic inferences' [11]. Individuals exposed to CSA tend to have increased presence of mental health symptoms, while experiencing reduced emotional intelligence and being 'conditioned to be more fearful of social cues' [11].

Victim-survivors with a tendency to anxiety and heightened fear in everyday social interaction will inevitably experience challenges in interpersonal relationships. Unsurprisingly, difficulties forming and maintaining interpersonal relationships have been found to be a long-lasting effect of CSA [4,6,24]. Social functioning seems to be negatively affected in various ways due to impaired sense of self among victim-survivors, which includes the experience of sexual difficulties [37].

Sexual dysfunction

A large body of literature indicates that individuals with a history of CSA tend to suffer sexual difficulties [6,11,17,32]. Problematic sexual functioning includes low sexual desire, decreased sexual arousal and genito-pelvic pain, which results in overall reduced sexual satisfaction.

While systems that mediate sexual dysfunction in CSA victim-survivors are not well understood, neuroplastic adaptation was observed in a recent study. Heim and colleagues [17] examined data from 51 female participants (of which 28 experienced CSA) using MRI methodology. After analysing multiple regions of the cortex, and comparing women with CSA histories and women with no child abuse histories in relation to cortical thickness, the study found changes in the somatosensory cortex, which is responsible for processing sensations and perceptions. Women with CSA histories were found to have 'pronounced cortical thinning in the genital representation field of the primary somatosensory cortex'. The researchers concluded that CSA experiences resulted in neuroplastic reorganisation as a protective neurobiological mechanism, which later led to sexual dysfunction including reduced sexual desire and sensation as well as genito-pelvic pain.

Genito-pelvic pain

Genito-Pelvic Pain/Penetration Disorder is a disorder of pain and sexual function. It is a new diagnosis that replaces previous diagnoses of dyspareunia (recurrent persistent genital pain with sexual intercourse) and vaginismus (perceived inability of penetration) [2]. It is commonly accepted that genito-pelvic pain has biomedical and psychosocial origins [17]. Women with a history of intra-familial CSA have been found to be 6.5 times more likely to experience unexplained vulvar pain in a community-based study of 125 women with a matched control group.

As discussed above, the link between CSA and biological stress responses is strong. Psychological stress mechanisms interact with endocrine, immune and nervous systems. Neurodevelopmental disruptions may not only cause 'neurological scars' [12] that have been found to predispose victim-survivors to mental health and substance use problems, but also explain genito-pelvic pain. Abnormalities in adaptive responses of the immune system through the hypothalamic-pituitary-adrenal (HPA) axis have been found in psychopathology (e.g. depression, anxiety disorders, eating and substance use disorders, dissociative disorder and PTSD). The same stress mechanisms have been implicated in genito-pelvic pain among victim-survivors of CSA [11,32]. Inflammation of vulvar tissues has been associated with the experience of vulvovaginal pain even to light touching, which disrupts or inhibits sexual activity [14]. Increased pain sensitivity has been explained with thinning of the cortex, which leads to a lower pain threshold and appears to be experienced as pain to even light touch [17].

Importantly, increased fear-avoidance behaviours have been reported to illustrate a negative feedback loop in women with genito-pelvic pain. Experiences of pain produces fear and cognition of catastrophising, which lead to somatic hypervigilance that magnifies sensations and ultimately result in sexual distress due to associated cues of the sexual abuse and automatic physiological responses [37] and sexual avoidance behaviours [31]. Trickett, *et al.* [32] found that women who had experienced CSA by their biological father reported the highest level of aversion and ambivalence towards their sexuality when compared to other intrafamilial abusers.

Women often conceal experiences of CSA. In relation to intra-familial CSA, childhood attachment is critical in the formation of identity and interpersonal relationships [24,35], which affects the ability to trust someone. Often, individuals with a history of CSA experience unstable relationships with intimate partners due to their inability to develop close relationships [3,4]. Victim-survivors of CSA tend to experience extensive recurring problems due to the betrayal of trust and their inability to find satisfaction in intimate relationships. As a consequence, higher rates of revictimisation through intimate partner violence [32] and separation or divorce was reported when compared to couples where no CSA was experienced.

Intergenerational impact

The cost of CSA is not limited to the life span of the victimised person. The negative effects include intimate partners (as discussed above), but also other family members such as the victim-survivor's children [35]. Strong evidence suggests that intergenerational transmission impacts future generations. Trickett, *et al.* [32] in a 23-year study of three generations of intrafamilial CSA found 'a persistent cycle of violence'. Not only were victim-survivors abused by their biological fathers twice as likely to be revictimised by an intimate partner during adolescence/early adulthood, but victimisation was also observed in the next generation. Their study found that 45% of mothers of CSA victim-survivors reported to have experienced intra-familial CSA as they were growing up compared to only 16% of mothers of non-abused children. Furthermore, the study found an increased risk for maldevelopment and environmental impact (cognitive, physical, psychological and behavioural impairment) in the offspring of women with CSA histories.

Strong evidence suggests that maternal stress impacts offspring in relation to glucocorticoid and catecholamine levels and immune function [11,16,32]. Furthermore, attachment behaviours have been found to be reciprocally impacted [16]. Children showed increased anxiety levels, fearful behaviours and lower social competence [11]. Epigenetic mechanisms may explain these findings.

Epigenetic influences

Epigenetics provides evidence that external factors in a person's environment influence physical and mental health outcomes across generations [15,22], which has been defined as 'functionally relevant modifications to the genome' [36]. The changes in DNA expressions are related to the complex process of gene activation and silencing. DNA methylation, RNA-silencing and histone modification are the epigenetic mechanisms that are related to the regulation of gene activity in response to environmental influences (activating or altering levels of gene expression) [16]. In this regard, Kanherkar, *et al.* [22] asserted that 'every cell in the organism carries an identical genome, however, despite stability of these instructions, the terminal phenotype within an organism is not fixed and deviation is caused by gene expression changes in response to environmental cues'.

Gene expressions are affected by exposure to CSA [5,9]. Scientific studies found differences in DNA methylation when brain structures and neurotransmitter responses were compared [9,24,35]. In this regard, Yang, *et al.* [36] stated that 'novel epigenetic modifications' were identified in cellular signalling systems that are involved in gene regulation of victim-survivors when compared to non-abused control group participants. Differing patterns of methylation across the entire genome were found indicating biological pathways for physical diseases and mental health problems associated with CSA [9,36] and negative functional outcomes [11,24,35]. Beach and colleagues [5] argued that methylation as an independent biological mechanism corroborates findings that CSA has an extensive negative impact on victim-survivors and as such provides evidence to reject claims of retrospective self-report bias and the absence of reliable medical evidence in empirical studies that provide evidence of the effects of CSA.

Epigenetic pathways affect childhood development, health and behavioural outcomes passed down from the mother [22] into the third generation [16]. Maternal stress influences the foetus in utero and can cause epigenetic changes [16,22]. DNA methylation and RNA expressions are influenced by maternal mental health, health risk behaviours and social environment during pregnancy. Modification of epigenetic signatures is linked to neurological diseases during foetal brain development. This includes stress triggered by interpersonal violence, affecting changes in the DNA of the unborn baby's cortisol receptor [22]. Furthermore, after birth, physical growth and learning were found to be influenced by the biological memory and epigenetic modifications with longterm impacts.

The above discussion indicates that epigenetic transgenerational influences may explain the observed 'cycle of violence' in relation to CSA [32]. Epigenetic changes have been found to contribute to intergenerational effects in that biochemical changes appear to be inherited. However, as emphasised, the role of the environment indicates that positive personal experiences and lifestyle changes may alter a person's health regardless of inherited genes. Advances in epigenetic mechanisms may assist in reducing vulnerable individuals' risk of biochemical and physiological impacts of CSA victimisation.

Recovery – neuroplasticity

It is important to emphasise that recovery from CSA is possible [4,24,35,36]. Given the discussion above, it is fair to argue that early intervention for victim-survivors is critical. Effective psychosocial interventions are important as they can reverse the biochemical and behavioural impacts of CSA [11]. Trickett, *et al.* [32] indicated the importance of trauma-informed psychotherapy, which may reduce stress impacts in children and adults. Similarly, DeBellis, *et al.* [11] reported that children have been found to improve global brain functioning, alleviate mental health symptoms and normalise physiological functioning after cortisol activity sensitive to social context has been reduced through enhanced medial prefrontal neurogenesis. This may include medical intervention to support pro-social behavioural psychotherapy. Adverse outcomes from CSA victimisation can be reversed through therapy. Further research is needed to understand how neurobiological insight may assist in devising most effective interventions, which will assist in decreasing intergenerational transmission of CSA. DeBellis and colleagues [11] indicated that future studies 'will help the field begin to understand these processes in humans'.

Recent research evidence indicates that epigenetic mechanisms are not permanent – they can be reversed [6,35,36]. This means that complete physical, mental and behavioural social functioning can be restored. Not only risk for health and behavioural problems can be reversed through treatment intervention [4] (Barker, 2002), but even neurocognitive impairment can be reversed (Blanco, *et al.* 2015). Jonsson [21] reported that hippocampal size was found to increase with psychotherapy. Therapy is important not only to increase quality of life for the primary victim-survivor but because of the intergenerational impact of CSA victimisation. Therefore, intervention should include targeted parenting programs, which will likely have intergenerational benefits.

Enhanced understanding of the neurological impact of CSA, particularly in relation to interpersonal functioning is imperative in treatment and prevention intervention. Trickett, *et al.* [32] argued that women with a history of intrafamilial CSA may learn to develop trust in interpersonal relationships with males through positive experiences. These include emotionally secure experiences, which facilitate a belief that counters general assumptions of all men are abusers.

Preventative strategies should address interpersonal skills deficits along with emotion regulation behaviour to reduce further negative impacts due to maladaptive coping strategies such as overeating and substance use. Additionally, it is recommended that better training of educational professionals is required to identify and understand behavioural symptoms. If teachers are able to detect children's distress symptoms and respond sensitively, not only attachment and functional outcomes are improved, but behavioural problems are reduced [35].

Conclusion

This paper, drawing on neurobiological research, provided compelling evidence of the multifaceted and longterm impact of CSA. It dispelled the myth that 'adult-child sex' was much less harmful as previously reported and could even be beneficial. Neurological impact has been scientifically established. Physical diseases including cancer, cardiovascular problems, diabetes and obesity have been associated with CSA victimisation later in life. Biological processes relevant to mental health and physical health outcomes as well as sexual difficulties have been reliably linked to CSA through longterm changes in brain development. Furthermore, recent epigenetic findings unmistakably confirm that CSA has an intergenerational impact through affected gene expressions. Identifying children early and providing effective prevention and intervention therapies along with evaluative research will hopefully demonstrate the positive impact on primary victims in areas such as cognitive functioning, interpersonal relationships and lifestyle, which, it is hoped, will demonstrate intergenerational disruption of harmful outcomes of CSA.

Acknowledgements

The author would like to thank Manuela Harmon and Bec Dallin for reviewing the manuscript and their valuable comments.

Conflict of interest

The author declares no conflict of interest.

References

1. Afifi T, *et al.* "The relationship between child abuse, arental divorce, and lifetime mental disorders and suicidality in a nationally representative adult sample". *Child Abuse & Neglect* 33.3 (2009): 139-147.
2. American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Washington, DC.
3. Arnold C and Fisch R. The Impact of complex trauma on development. New York, NY: Jason Aronson Publishers (2011).
4. Baker CD. "Female survivors of sexual abuse: An integrated guide to treatment". New York, NY: Routledge. (2002)
5. Beach SRH, *et al.* "Impact of child sex abuse on adult psychopathology: A genetically and epigenetically informed investigation". *Journal of Family Psychology* 27.1 (2013): 10.
6. Blanco L, *et al.* "Neurobiological changes in brain structure and functions among individuals with a history of child sexual abuse: A review". *Neuroscience and Biobehavioral Reviews* 57 (2015): 63-69.
7. Boden JM, *et al.* "Exposure to childhood sexual and physical abuse and subsequent educational achievement outcomes". *Child Abuse & Neglect* 31.10 (2007): 1101-1114.
8. Cecil C, *et al.* "Epigenetic signatures of childhood abuse and neglect: Implications for psychiatric vulnerability". *Journal of Psychiatric Research* 83 (2016): 184-194.
9. Cicchetti D, *et al.* "An investigation of child maltreatment and epigenetic mechanisms of mental and physical health risk". *Developmental Psychopathology* 28 (2016): 1305-1317.
10. Clancy SA. The trauma myth: The truth about the sexual abuse of children and its aftermath. New York, NY: Basic Books. (2009).
11. De Bellis MD, *et al.* "Neurodevelopmental biology associated with childhood sexual abuse". *Journal of Child Sexual Abuse* 20.5 (2011): 548-587.
12. De Carvalho Tofoli, *et al.* "Early life stress HPA axis, and depression". *Psychology & Neuroscience* 4 (2011): 229-234.
13. Ehman R. "What really is wrong with pedophilia?" *Public Affairs Quarterly* 14 (2000) 129-140.

14. Falsetta ML., et al. "Identification of novel mechanisms involved in generating localized vulvodynia pain". *American Journal of Obstetrics and Gynecology* 213. (2015): 38. e1–e38.e12.
15. Gustafson TB and Sarwer DB. "Childhood sexual abuse and obesity". *Obesity Review* 5.3 (2004): 129-135.
16. Harper LV. "Epigenetic inheritance and the intergenerational transfer of experience". *Psychological Bulletin* 131.3 (2005): 340-360.
17. Heim CM., et al. "Decreased cortical representation of genital somatosensory field after childhood sexual abuse". *The American Journal of Psychiatry* 170 (2013): 616-623.
18. Holt TJ., et al. "Considering the pedophile subculture online". *Sexual Abuse: A Journal of Research and Treatment* 22. (2010): 3-24.
19. Irish L., et al. "Long-term physical health consequences of childhood sexual abuse: A meta-analytic review". *Journal of Pediatric Psychology* 35.5 (2010): 450-461.
20. Jahnke S., et al. "What if the child appears to enjoy it? Moral attitudes toward adult-child sex among men with and without pedohebephilia". *Journal of Sex Research* 31 (2017): 1-12.
21. Jonsson PV. "Complex trauma, impact on development and possible solutions on an adolescent intensive care unit". *Clinical Child Psychology and Psychiatry* 14.3 (2009): 437-454.
22. Kanherkar RR., et al. "Epigenetics across the human lifespan". *Frontiers in Cell and Developmental Biology* 2 (2014): 1-19.
23. Kershner S. "The moral status of harmless adult-child sex". *Public Affairs Quarterly* 15 (2001): 111-132.
24. Kezelman C., et al. "The cost of unresolved childhood trauma and abuse in adults in Australia. Sydney, NSW: Adults Surviving Child Abuse and Pegasus Economics. (2015).
25. Malón A. "Adult-child sex and the limits of liberal sexual morality". *Archives of Sexual Behavior* 44.4 (2015): 1071-1083.
26. Münzer A., et al. "Psychological symptoms of sexually victimized children and adolescents compared with other maltreatment subtypes". *Journal of Child Sexual Abuse* 25.3 (2016): 326-346.
27. Papalia N., et al. "The long-term co-occurrence of psychiatric illness and behavioural problems following child sexual abuse". *Australian and New Zealand Journal of Psychiatry* 51.6 (2017): 604-613.
28. Rind B., et al. "A meta-analytic examination of assumed properties of child sexual abuse using college samples". *Psychological Bulletin* 124.1 (1998): 22-53.
29. Rind B and Welter M. "Reactions to first postpubertal coitus and first male postpubertal same-sex experience in the Kinsey sample: Examining assumptions in German law concerning sexual self-determination and age cutoffs". *International Journal of Sexual Health* 28 (2016): 117-128.
30. Russel SJ., et al. "Impact of childhood experience and adult well-being on eating preferences and behaviours". *BMJ Open access* (2016).
31. Santerre-Baillargeon M., et al. "Anxiety mediates the relation between childhood sexual abuse and genito-pelvic pain in adolescent girls". *Journal of Sex and Marital Therapy* 43 (2017): 774-785.
32. Trickett K., et al. "The impact of sexual abuse on female development: Lessons from a multigenerational, longitudinal research study". *Developmental Psychopathology* 23.2 (2011): 453-476.
33. Tromovitch P. "The Multinational Life Experience and Personality Project (MLEPP). Keynote paper presented at 2017 Society for the Scientific Study of Sexuality Symposium: Sexual Science in the 21st Century – The Australasian Experience. Sydney, NSW: Western Sydney University, School of Social Sciences and Psychology.
34. Wakefield H. "The effects of child sexual abuse: Truth versus political correctness". *Issues in Child Abuse Accusations* 16 (2006).
35. Weder N and Kaufman J. "Critical periods revisited: Implications for intervention with traumatised children". *Journal of the American Academy of Child and Adolescent Psychiatry* 50 (2011): 1087-1089.
36. Yang BZ., et al. "Child abuse and epigenetic mechanisms of disease risk". *American Journal of Preventive Medicine* 44.2 (2013): 101-107.
37. Zwickl S and Merriman G. "The association between childhood sexual abuse and adult female sexual difficulties". *Sexual and Relationship Therapy* 26 (2011): 16-32.

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