



Childhood Maltreatment Trauma: Relevance for Adult Physical and Emotional Health. A Review

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Abstract

Childhood maltreatment (CM) is a widespread public health concern in the U.S. as it affects almost four million children annually. The adverse consequences of CM can be seen across development from attachment disturbances and developmental delays in infancy to an increased risk for conduct and emotional problems in later childhood and adolescence. In addition, the associations between CM and negative outcomes have been traced as far as adulthood to mental and physical wellbeing of adult survivors. This article summarizes current knowledge linking CM exposure to adult functioning, and highlights factors that either buffer or accelerate risk for the individual in the aftermath of childhood trauma. The recognition of distinct factors that shape the relationship between CM and subsequent outcomes may provide a window of opportunity for the development of targeted clinical interventions to adult survivors.

Keywords

Childhood maltreatment, Mental health, Physical health, Resilience

Introduction

Childhood Maltreatment (CM) is prevalent and impacts many children in the United States, with recent national estimates of 3.9 million children being reported to Child Protective Service (CPS) in 2013 and 679,000 substantiated child abuse cases [1]. Childhood maltreatment encompasses multiple different forms of trauma, including physical, sexual, or emotional abuse and also neglect. Neglect is the most widespread type of maltreatment (78% of substantiated reports due to neglect), followed by physical abuse (18.3%) and sexual abuse (9.3%) [1]. The damaging effects of CM can manifest as early as infancy or early school age [2] with negative consequences on memory, attachment, socio-emotional development, or behavioral adjustment [2-6] compared to children who had not experienced early maltreatment. By adolescence, early maltreatment is associated with later depression and suicide attempts [7-10], juvenile delinquency [10-12], conduct disorder [13], substance use disorders [14] and impairments in interpersonal functioning [8]. Overall, the devastating consequences of CM on the developmental trajectories of children and adolescents are well documented [15-17]. In this report we focus on effects of CM beyond childhood and adolescence and review published work on CM and adult outcomes, including physical, emotional, and overall functioning. We discuss

possible mechanisms underlying the link between CM and adult wellbeing and present several risk and resiliency factors that may be implicated in the relationship between CM and adult outcomes.

Method

In order to identify the most salient research for the current review, the online databases PsycINFO, PubMed, and Google Scholar were searched. The terms for CM included "childhood maltreatment," "childhood abuse" "childhood adversity," while outcome searches were "adult outcomes" "adult health" "adult physical health" and "adult mental health. Factors related to adaptive outcomes included search terms "resilience" "protective factors" "biological factors" "family factors" and "social support." Inclusion criteria for studies included in this review paper were as follows: published studies in English; studies reported on maltreatment participants who had experienced maltreatment before age 18 (i.e., in infancy, childhood, or adolescence); reported study outcome were measured in adulthood (i.e., age 21 and older). There were no exclusions regarding publication year; furthermore all childhood maltreatment types (i.e., childhood physical, sexual and emotional abuse, and physical and emotional neglect) and childhood adversity, a term that encompasses conditions that enhance likelihood for childhood maltreatment (e.g., living with a mentally ill or substance abusing parent, high interpersonal conflict in the home etc.) were included in this report. A total of 200 articles were downloaded and their abstracts reviewed for inclusion by LH and VMF; consensus for appropriate inclusion was reached on 160 papers, which are included in this review.

CM Effects on Adult Physical Health

Adult survivors of CM are more likely to report physical ailments than adults who have not experienced CM including chronic pain [18], headaches and migraine [19-22], gastrointestinal problems [20,23], asthma [21,23], diabetes and heart problems [19,21,23], bronchitis and emphysema [19,24], and finally, cancer [19,25]. These adult survivors utilize medical and emergency services more often for physical health problems [26-29], resulting in increased health care costs [26,29]. Walker and colleagues (1999) reported that annual health care costs were about \$97 higher in women with CM exposure compared to women without a history of CM, and victims of childhood sexual abuse (CSA) had the highest cost increase by \$245 annually. Childhood maltreatment is also related to higher adult BMI

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and obesity [19,24,30-32], which is in turn associated with numerous consequences for health and well-being [33-36]. In a sample of over 300 bariatric surgery candidates who presented with extreme obesity (Mean BMI=51.1, SD 9.6kg), over two-thirds (69%) endorsed some form of childhood maltreatment [30]. Another consequence of CM exposure may be greater engagement with risky sexual health behaviors (e.g. younger age of initial sexual activity, greater number of sexual partners, more unplanned pregnancies, greater frequency of sexual intercourse with strangers, etc. [19,24,28,37]. This may lead to increased risk for sexually transmitted infections [19,24]. This relationship between sexual problems and CM has been studied most extensively in survivors of sexual abuse [28,38]. Finally, adult CM survivors also report more sleep problems including problems falling and staying asleep as well as trauma related nightmares [19,24,39-41] compared with adults who have not experienced CM. In summary, exposure to CM is associated with a host of physical problems or problem behavior that increases the likelihood for physical illness and suffering among these adult survivors.

CM Effects on Adult Emotional Health and Overall Functioning

Depression is one of the most common outcome variables of study related to childhood adversity, and the literature widely supports that those who have experienced CM have an increased risk of depression in adulthood [23,28,37,42-48]. Suicidal ideation and attempts, the most severe symptom of depression, is also associated with CM, and this association has been found amongst psychiatric inpatients [49], community health settings [50,51], and large longitudinal studies [19,28,52]. In addition to depression, CM also increases the likelihood for other psychiatric conditions including anxiety disorders [23,28,44] post-traumatic stress disorder [45,47,53], personality disorders [7,54-56] schizophrenia [57,58] and bipolar disorder [59]. There are also markedly higher rates of substance use disorders in CM survivors [60,61].

CM may also interfere with domains in a person's life course that are the foundations for overall achievement and life satisfaction. CM survivors may experience problems in interpersonal functioning, relationship difficulties, and marital and family problems [37,54]. Their educational achievement is impaired [54,62,63], most likely based on the fact that CM survivors show lower scores on standardized tests, more school absenteeism and grade repetitions, and are more often school dropouts [64]. Subsequently, adult CM survivors are also more likely dependent on welfare, and have difficulties in finding and maintaining employment [54,62,63,65]. Additionally, rates of CM are also reported higher in homeless populations than in the general population [66].

In summary, abundant literature supports that CM has detrimental effects on adult physical and psychological functioning, and the effects appears to be dose-dependent, such that greater severity of CM (i.e., longer abuse exposure, or multiple types of abuse) is associated with increased prevalence of poor outcomes [19,67,68], more complex symptom presentations [45], and more severe problems [69].

Possible Pathways Linking CM and Adult Functioning

In a seminal paper based on a review of the literature, Kendell-Tackett and colleagues (2002) proposed four possible pathways of how CM exposure may translate to poor adult functioning. This section expands upon this framework with the inclusion of more recent findings in the literature supporting its merit. In addition, we will also elaborate on how CM may be affecting a person's capacity for emotion regulation, ultimately laying the ground for adult psychopathology.

As a first pathway, Kendell-Tackett et al. (2002) proposed that CM may predispose an individual to engage in unhealthy life-style behaviors and habits that subsequently interfere with one's health [70]. Research supports the relationship of CM to increased smoking [19,71,56], sedentary lifestyle [19], alcohol and substance

abuse [19,28,47,54,71] and poor eating habits [72]. These behaviors over time may increase the risk for cardiovascular disease, cancer, and overall increased mortality [73-76]. Knowledge about this link is highly relevant for clinicians as they have access to this patient population, and can educate about and motivate towards healthy life style changes.

As a second pathway, the research group proposed the phenomenon of re-victimization, that is, the observation that survivors of CM are more likely to again encounter abuse later in their life, often through a romantic partner [27,66,77,78]. It has been hypothesized that victims of CM are more likely to mate with abusive romantic partners later in life because a critical psychological sequel from their childhood abuse was the establishment of low self-esteem and the failure to learn appropriate assertiveness and self-protection skills [77,79]. Over time, CM survivors may experience learned helplessness, expecting maltreatment to be a normative part of interpersonal relationships, and failing to see possibilities for escape or alternatives [80].

As a third pathway, CM may lead to changes in cognitive processing that ultimately shapes their overall functioning [70,81]. Survivors of CM are less accurate in processing stimuli designed to elicit different emotions and seem to have a "bias towards more negative perceptions" [82]. For example, when exposed to standard pictures that are known to elicit positive, neutral, or negative emotions, CM survivors failed to recognize the positive and neutral pictures more often than controls did, while their recall for negative pictures was equally accurate [81]. Young & Widom (2014) suggest that this may be because CM survivors develop a negative world view from their childhood experiences, which as such, makes positive emotions more difficult to recall [81]. Others have supported that negative cognitive styles mediate the relationship between CM and subsequent psychopathology [55,83-85]. As a result of this altered emotion processing in CM survivors, these individuals may develop negative internalized beliefs about themselves and their world including feelings of shame, mistrust [83], pessimistic and rigid beliefs about the self and world, hopelessness [84,85], and persistent feeling of the world being dangerous [86]. These negative cognitions are thought to underlie vulnerability for depression [87,88], PTSD [89,90] and personality disorders [91,92].

Finally, as a fourth pathway, Kendell-Tackett et al (2002) propose that the CM may lead to poor outcomes through greater vulnerability for negative emotions, which then predispose to greater risk for psychopathology [70]. The capacity to regulate one's emotions and tolerate and recover from distress is a critical component for emotional wellbeing across the life span [93-95]. Managing arousal and regulate one's emotions is established already in infancy and early childhood through parental modeling and coaching [96]. In abusive circumstances, the abusive caregiver fails to respond to the emotional needs of the young child and thus jeopardizes the child's developmental competencies in acknowledging and managing emotions [97]. This child grows up to be a parent and adult with impaired ability to regulate emotions when faced with life circumstances (e.g., stress, loss, relationship challenges...) that demand coping and affective regulation [97]. This inability, in turn, may make this person more vulnerable to experience psychopathology, such as depression [83], borderline personality disorder [97], or PTSD [98,99].

Protective Factors that may Buffer CM Effects

A review by Heller and colleagues [100] outlined three main factors that may promote a person's resilience following childhood maltreatment: 1) Biology, 2) Family support, and 3) Social support. In the remainder of this paper we will elaborate on these three factors. This section expands upon Heller's original findings on temperamental and dispositional features associated with resilience to include other biological constructs as well including gender differences, genetics and neuroendocrine functioning which all are reported to modify vulnerability and resilience. Moreover, we also expand in this review on additional family and social support factors that have been published since the original Heller paper.

Biology

A person's biological make-up (e.g. gender or trait markers,) may enhance or reduce resilience. Women who have experienced CM are more vulnerable than men to develop negative consequences including higher rates of depression [101] and PTSD [102,103]. Several factors may make women more vulnerable to effects of trauma. Reproductive hormones (e.g. estrogen, progesterone) have been found to alter the functionality of the biological stress systems (e.g., the hypothalamic-pituitary adrenal (HPA-) stress axis) and also the processing of emotional experiences [104,105]. Specifically, reproductive hormones influence emotional memory processing: during the luteal phase (high levels of progesterone and estradiol) women have more intense emotional memory acquisition/consolidation and recall, and have more intrusive and intense memories in response to trauma experiences (e.g., flashbacks; [106,107] when compared with women in the follicular phase or compared to men. Thus, women who are CM survivors and in relationships with ongoing abuse exposure may be at a greater risk for psychopathology because of their reproductive hormones. In addition, women may also be at an increased risk for sleep difficulties because of reproduction. Sleep disturbances are more common around times of reproductive changes such as pregnancy [108] and in the postpartum [109,110]. A review by Soares and Murray (2008) describes the numerous hormonal disruptions implicated in the postpartum period which may explain impacts to sleep outside of newborn care, such as the decline in progesterone after delivery as well as changes in melatonin, both of which are implicated in sleep [111]. In summary, reproductive hormones may make women with CM histories particularly vulnerable for psychopathology and sleep disorders.

Temperamental differences may also increase vulnerability or act as buffer following CM exposure. Temperament can be defined as biologically based individual differences influenced by heredity, maturation, and experience [112]. Genes code for the biological substrate, and inherited variations of one's genetic code may increase or decrease one's resilience [113]. For example, of the several genes which may contribute to temperamental differentiation, the dopamine D4 receptor (DRD4) gene has been studied more extensively. Having the DRD4 long allele (L-DRD4 or also called 7-repaet polymorphism, 7R) is implicated in greater attention difficulties and higher activity levels [114,115] and has been associated with ADHD in children [116]. In adulthood, Bakermans-Kranenburg and colleagues (2011) found that having the DRD4-7R moderated the relationship between childhood parental problems and unresolved trauma and loss, such that parenting problems only mattered in 7R carriers [117]. Findings like these and many similar published in recent years, document the importance of both genetic and environmental processes which may increase risk and resilience following CM.

Other individual characteristics may also be related to differential resilience following CM [118] including intellectual ability, self-esteem, locus of control, attribution of blame, and spirituality [100]. Some research supports that greater intelligence fosters more successful coping [119,120]; however operational definitions of intellectual functioning vary in the literature, and measures of intelligence tend to be indirect and global than direct measures of IQ [100]. Additionally, positive beliefs about the self, such as high self-esteem and internal locus of control are associated with lower rates of psychopathology and lower rates of re-victimization following CM and thus may also be important factors in resilience [119,121-123]. Results on locus of control are heterogeneous, however, as much research has found that the tendency to blame external sources (external locus of control) for the traumatic event (e.g. blaming the perpetrator for the event) is more common in resilient samples [124-126]. Finally, higher levels of spirituality or religiosity are associated with resilient outcomes [121,126] despite the fact that CM in general is often associated with lower religiosity [127-129].

CM may change the functioning of one's neuroendocrine systems (i.e., HPA axis) and alter the structure or functioning of brain neurocircuits related to stress coping. Some research suggests

that survivors of CM have a decrease in the size of the hippocampus, amygdala, and neocortex which alters the HPA axis functioning [105,130] leaving survivors of CM more vulnerable to stress [131]. Genetic variants in the axis' functioning (e.g., variations in the gene coding for the corticotrophin-releasing hormone receptor CRHR1) may be related to more dysfunctional coping following environmental stress [132]. For example, in survivors of CM, one variant in the CRHR1 gene has been associated with a protective effect against adult depression [133,134], indicating that a person's biological make-up interacts with the environmental exposure (i.e., the CM) to create risk or resilience.

Family factors

Several studies support findings that family factors may moderate risk for adult psychopathology following CM. Negative family functioning (e.g. conflict) contributes to worse adult outcomes and positive family functioning (e.g. expressiveness, and family cohesion) contributes to better outcomes [135-138]. Perceived social support, defined as perception of availability and support (e.g. emotional, social, practical, financial) from family sources are also protective and buffer against depression and anxiety [139], or suicide attempts [140] in CM samples. Within the context of the family, parental support as well as secure attachment with a parent or care giver who have also been implicated in adaptive outcomes following CM. The adaptive effects of caregiver support include higher self-esteem, lower internalizing symptoms (anxiety, depression) and externalizing symptoms (aggression, delinquency), as well as decreased cigarette smoking compared to CM survivors with lower caregiver support [56,141-144]. In fact, Fromuth (1986) found that correlations between childhood sexual abuse and later psychological adjustment largely disappeared once controlling for parental support, indicating the critical role of parental support in the aftermath of CM. However, other studies do not confirm the role of family in mitigating adult outcomes. Howell & Miller-Graff (2014) found that only friends' social support was associated with resiliency to adult psychopathology [145], and other research has found that parental support did not have a mediating effect on adult psychological adjustment following CM [146]. Variation in methodology for defining family functioning and support may contribute to differential outcomes [100]; as well as the fact that some studies do not separate social support into family versus other forms of support [48,147]. In addition, the perpetrator of maltreatment is not usually controlled for in analyses with social support, and thus, it likely follows that support from a parent or caregiver may not be protective in cases where he or she was the source of maltreatment [145,146].

Social support

Finally, non-familial forms of social support may be also highly relevant for adaptation following CM. Heller et al. (1999) emphasizes the role of school and community involvement [100] in providing a buffer for CM [148,149]. In addition, social support from friends has shown a protective effect against adult psychopathology in CM survivors [145,150]. Research has also demonstrated the effect of romantic attachment relationships in adulthood following CM; secure romantic attachment orientation appears to be protective, while insecure attachment is associated with greater psychopathology [85,138,151,152]. Thus, a relationship with a supportive partner appears to be a critical factor for resiliency following CM exposure [144].

Social support in the context of abuse disclosure may be important for survivors as well [48,126]. Some research has found that in the case of sexual abuse disclosure, subsequent adulthood functioning was mediated by negative reactions of caregivers or family to the disclosure as a child [153,154] highlighting the importance of social support following the immediate aftermath of childhood maltreatment.

Conclusion and Clinical Implications

CM is not uncommon and has been shown in multiple studies

to potentially have a devastating impact on the lives of many adult survivors. In this paper we have discussed the many ways how CM may shape adults' physical and emotional functioning, and proposed, based on the literature, several mechanisms for the long term poor adult outcomes. For clinicians this knowledge is highly relevant, as it may shed light on some of their "difficult" patients' maladaptive behaviors and help shape their understanding for why these patients may have a difficult time modifying their life styles. Recent work on Motivational Interviewing [155] strategies, specifically use of reflective listening and emotional validation, had demonstrated good results to engage individuals with trauma backgrounds [156]. It is apparent that CM may impact well-being in adulthood through profound effects on physical and emotional health as well as other aspects of functioning, including education, romantic relationships, and world view. Finally, we also outlined risk and protective factors that may modify the risk. Women and individuals with low family and social support seem to be particularly at risk for poor outcomes in the face of CM. The recognition of factors that may modify the relationship between CM and subsequent outcomes may provide a window of opportunity for the development of targeted clinical interventions to hopefully change life trajectories of individuals touched by childhood maltreatment.

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