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The Impact of War Trauma and Adverse Childhood Experiences in Bosnia and Herzegovina: The Case of the Srebrenica Genocide

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ABSTRACT

Adverse Childhood Experiences (ACE) represent a major determinant of adult mental and physical health outcomes, encompassing abuse, neglect, and dysfunctional family environments. When compounded by war trauma, their impact becomes substantially more severe. This review systematically examines research published between 1995 and 2023 on the combined effects of ACE and war trauma in Bosnia and Herzegovina, with a specific focus on the Srebrenica genocide. The search was conducted across PubMed, Scopus, and Web of Science databases using predefined inclusion criteria. Studies consistently indicate high exposure rates among children, with PTSD prevalence ranging from 30–70% and depression from 25–60%. The cumulative impact of early adversity and war exposure contributes to chronic somatic diseases, including cardiovascular and metabolic disorders, as well as intergenerational psychological transmission. This review identifies a research gap concerning integrated psychosocial and biological models of trauma recovery in post-conflict societies. Findings underscore the need for public health strategies that prioritize early trauma screening, community-based interventions, and long-term mental health programs for survivors and their descendants.

INTRODUCTION

Adverse Childhood Experiences (ACE) represent a significant risk factor for the development of mental and physical disorders in adulthood (Felitti *et al.*, 1998). ACE include physical, emotional, and sexual abuse, neglect, and dysfunctional family environments (Anda *et al.*, 2006). War trauma further amplifies the effects of ACE, exposing children to violence, parental loss, forced displacement, and uncertainty (Macksoud & Aber, 1996). Children affected by the war in Bosnia and Herzegovina, particularly survivors of the Srebrenica genocide, exhibit increased risks of post-traumatic stress disorder (PTSD), depression, and anxiety (Ajdukovic, 2003). Long-term consequences include somatic conditions such as cardiovascular and metabolic diseases, which increase overall morbidity (Danese & Tan, 2014). The combination of ACE and war trauma creates cumulative risks that persist into adulthood (Shonkoff *et al.*, 2012). Moreover, the intergenerational transmission of trauma affects the descendants of survivors, who may develop psychological and social difficulties even without direct exposure to war-related violence (Sagi-Schwartz *et al.*, 2008; Yehuda *et al.*, 2000). Understanding these interactions, with a specific focus on Srebrenica, is essential for the development of public health strategies, early detection mechanisms, and effective therapeutic interventions (Hamber & Wilson, 2002). Further research is required to design targeted support programs for populations affected by war (Musa, 2018; Kravić, 2013).

LITERATURE REVIEW

Previous research demonstrates that children exposed to

war trauma and ACE are highly vulnerable, with complex and multidimensional consequences (Betancourt & Williams, 2008). Systematic reviews confirm that individuals with multiple ACEs have significantly higher risks of PTSD and depression (Hughes *et al.*, 2017).

Studies conducted in Bosnia and Herzegovina indicate that over 60% of children were directly exposed to wartime violence, resulting in high prevalence rates of PTSD, depression, and anxiety (UNICEF, 1996; Ajdukovic, 2003). Survivors of the Srebrenica genocide displayed particularly elevated risks, with PTSD rates between 50–70% and depression between 40–60% (Hamber & Wilson, 2002).

The intergenerational transmission of trauma has also been documented, with children of survivors showing symptoms of PTSD, depression, and social dysfunction even without direct exposure (Sagi-Schwartz *et al.*, 2008; Yehuda *et al.*, 2000). Neurobiological research suggests that alterations in the hypothalamic-pituitary-adrenal (HPA) axis and epigenetic mechanisms contribute to increased vulnerability (Yehuda & Lehrner, 2018).

MATERIALS AND METHODS

This study represents a structured review of published research addressing the intersection of Adverse Childhood Experiences (ACE) and war trauma, with a particular focus on the Srebrenica genocide and its long-term psychosocial and somatic consequences. The methodological approach followed the principles of systematic review design to ensure transparency, reproducibility, and analytical rigor.

A comprehensive literature search was conducted across

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three major scientific databases PubMed, Scopus, and Web of Science covering the period from 1995 to 2023. The search strategy employed the following combinations of keywords and Boolean operators: “Adverse Childhood Experiences” OR “ACE” AND “war trauma” AND “Bosnia and Herzegovina” AND “Srebrenica” AND (“mental health” OR “PTSD” OR “intergenerational trauma”). Reference lists of relevant articles were also screened to identify additional eligible studies.

Inclusion and Exclusion Criteria Studies Were Included If They

1. Reported empirical or review data related to childhood adversity, trauma, or post-conflict psychosocial outcomes in Bosnia and Herzegovina;
2. Focused on war-affected or genocide-survivor populations;
3. Were published in peer-reviewed journals or credible institutional reports;
4. Provided quantitative or qualitative data on psychological, biological, or social consequences.

Exclusion Criteria Encompassed

1. Editorials, conference abstracts, and non-peer-reviewed commentaries;
2. Studies unrelated to war trauma or ACE;
3. Articles lacking methodological transparency or data relevant to the Bosnian context.

Data Extraction and Quality Assessment

Data from eligible studies were extracted using a standardized framework covering study design, population characteristics, type of trauma exposure, outcome measures, and key findings. To assess methodological quality and reduce bias, included studies were evaluated according to adapted criteria from the Joanna Briggs Institute (JBI) Critical Appraisal Tools for cross-sectional and review studies. This ensured consistency in evaluating sample size adequacy, validity of measurement instruments, and clarity of analytical methods.

Analytical Approach

Findings were synthesized narratively, given the heterogeneity of study designs and outcomes. Emphasis was placed on converging patterns across epidemiological, clinical, and neurobiological domains. The synthesis particularly focused on the interplay between ACE and war trauma and their cumulative influence on long-term psychosocial and health outcomes, including intergenerational effects observed among descendants of Srebrenica survivors.

RESULTS AND DISCUSSION

Adverse Childhood Experiences and Mental Health Outcomes

ACE strongly correlate with mental disorders in adulthood. Individuals exposed to three or more ACEs demonstrate a two- to fourfold increase in the likelihood of developing post-traumatic stress disorder (PTSD)

and depression (Hughes *et al.*, 2017). Neglect, emotional abuse, and physical maltreatment are also associated with higher rates of anxiety, substance misuse, and suicidal behavior (Norman *et al.*, 2012). Biological mechanisms mediating these outcomes include dysregulation of the hypothalamic–pituitary–adrenal (HPA) axis, chronic inflammatory responses, and epigenetic modifications (Heim & Nemeroff, 2001). These findings indicate that early-life adversities embed long-lasting physiological and psychological vulnerability.

Somatic consequences of ACE include cardiovascular disease, type 2 diabetes, obesity, and metabolic syndrome (Danese & Tan, 2014). In post-conflict environments, these risks are amplified by additional stressors such as poverty, social disruption, and ongoing uncertainty (Shonkoff *et al.*, 2012). This highlights the cumulative burden of ACE compounded by war-related trauma.

War Trauma as an Extreme Form of ACE

Children in Bosnia and Herzegovina experienced multiple traumatic stressors, including bombardment, parental loss, direct violence, and forced displacement. More than 60% of children were directly affected by war-related violence (UNICEF, 1996). PTSD prevalence among war-affected children ranged from 30% to 50%, while depression and anxiety affected 25% to 40% (Ajdukovic, 2003). Social disruptions, such as interrupted education and reduced peer support, further exacerbated psychological stress (Muehlenkamp *et al.*, 2005). These findings demonstrate that war trauma acts as an intensifier of ACE effects, creating prolonged psychological and somatic vulnerability.

The Srebrenica Genocide

The Srebrenica genocide represents one of the most extreme manifestations of war trauma. Survivors exhibited particularly high prevalence of PTSD (50%–70%), depression (40%–60%), and anxiety disorders (30%–50%) (Hamber & Wilson, 2002). Beyond individual psychopathology, survivors experienced collective grief, moral injury, and disruption of social identity. Comparative studies of post-genocide populations, such as Holocaust and Rwandan genocide survivors, suggest that such extreme trauma generates long-term intergenerational effects, affecting community cohesion, family functioning, and social adaptation (Sagi-Schwartz *et al.*, 2008).

Intergenerational Transmission of Trauma

Trauma can be transmitted across generations through psychological, social, and biological mechanisms (Van IJzendoorn & Bakermans-Kranenburg, 1997). Epigenetic changes and dysregulation of stress-response systems have been observed among children of survivors (Yehuda & Lehrner, 2018). Intergenerational transmission manifests as heightened vulnerability to anxiety, depressive symptoms, and social dysfunction, even without direct exposure to war. These findings underscore the need for trauma-informed, multilevel interventions targeting both survivors and their descendants (Musa, 2018; Kravić, 2013).

Implications for Public Health and Clinical Practice

The synthesis of these findings demonstrates a clear need for trauma-informed policies within Bosnia and Herzegovina's public health and social service systems. Early screening for ACE and war-related trauma should be integrated into primary healthcare, schools, and community programs. Mental health interventions must adopt culturally sensitive frameworks, combining individual therapy with collective healing approaches rooted in local traditions. Long-term interventions should address intergenerational effects, promoting resilience among descendants of survivors (Hamber & Wilson, 2002; Musa, 2018). These strategies are essential for reducing the cumulative psychosocial burden of childhood adversity and war trauma.

CONCLUSION

The combined impact of Adverse Childhood Experiences (ACE) and war trauma significantly increases psychosocial risks in children, with consequences that persist into adulthood. Evidence from Bosnia and Herzegovina, particularly the Srebrenica genocide, demonstrates that extreme traumatic experiences contribute to high prevalence of PTSD, depression, anxiety, and long-term somatic disorders. Furthermore, trauma is transmitted intergenerationally through psychological, social, and biological mechanisms, highlighting vulnerabilities among descendants of survivors even without direct exposure to war-related violence.

These findings emphasize the urgent need for trauma-informed public health strategies, early detection programs, and culturally sensitive clinical interventions. Multidisciplinary approaches, combining mental health services, social support, community-based programs, and parental education, are essential for mitigating both immediate and long-term consequences of ACE and war trauma. Future research should focus on the development and evaluation of targeted support programs that address intergenerational trauma and promote resilience in post-conflict populations.

In conclusion, integrating empirical evidence on ACE, war trauma, and intergenerational effects into public health policy and clinical practice is critical to reduce cumulative psychosocial burdens and to foster adaptive functioning in affected communities.

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