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# Analysis of The Relationship Between Early Life Traumatic Experiences and Vulnerability to Psychosis in Adolescents: A Systematic Review

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***Abstract***

*Exposure to traumatic experiences during childhood can cause long-term adverse effects on an individual's psychological and neurobiological development. Psychosis as a severe psychiatric condition characterized by reality distortion often first emerges during adolescent development. This study was conducted using a systematic literature review method through analysis of relevant research articles published between 2015 and 2024. Based on literature analysis, adolescents with a history of childhood trauma show increased vulnerability to psychotic disorders through various mechanisms. Neurobiologically, complex trauma affects the dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis, triggers structural brain changes such as reduced hippocampal volume and amygdala enlargement, and disrupts neurotransmitter system balance. From psychological aspects, the formation of maladaptive cognitive schemas, memory disintegration, and deficits in social cognition also contribute to the emergence of psychotic symptoms. This review concludes that there is a significant relationship between past traumatic exposure and increased risk of psychotic disorders in adolescent populations, with a relationship pattern showing dose-response characteristics.*

***Keywords: Trauma, Adolescents, Psychotic Disorders, Mental Health.***

## INTRODUCTION

Adolescence to young adulthood is a critical phase in human development, during which the brain is still maturing and vulnerable to unsupportive environmental influences (Horne, 2025) . It is during this period that psychotic disorders, including schizophrenia and other psychotic spectrum disorders, often first emerge (Arseneault et al., 2011) . Contemporary research indicates that traumatic experiences in childhood significantly increase an individual's vulnerability to psychotic disorders later in life. (PSM Volume 50 Issue 11 Cover and Back Matter, 2020)

Characteristic symptoms of psychosis, such as auditory hallucinations and impaired thinking processes, not only affect cognitive function but also hinder adolescent social development. [4]Various forms of childhood trauma, ranging from physical, emotional, and sexual abuse to neglect, have been shown to have long-term effects on an individual's psychological and neurological development.[5] A longitudinal study conducted by Danese (2020) in JAMA Psychiatry revealed that adolescents with a history of trauma are 2-3 times more likely to develop psychotic symptoms compared to those who had a stable childhood (Halahakoon et al., 2020) .

The neurobiological mechanisms underlying this relationship are quite complex. Research (Teicher et al., 2022) explains that childhood trauma can cause dysregulation of the hypothalamic-pituitary-adrenal (HPA) system and trigger structural changes in the prefrontal cortex and hippocampus—areas of the brain that play an important role in regulating emotions and memory. These findings are reinforced by epidemiological data from a large meta-analysis (Varese et al., 2012) showing that 40-50% of adolescents with early psychotic symptoms reported significant traumatic experiences before the age of 16 (Fekih-Romdhane et al., 2024) .

Notably, research (Schalinski et al., 2018) reveals that multiple and chronic trauma shows a stronger correlation with the severity of psychotic symptoms. However, it should be noted that not all individuals who experience trauma will develop psychotic disorders. As emphasized in the study (Infurna et al., 2016) , there are protective factors such as adequate social support, psychological

resilience, and good attachment quality that can moderate the relationship between trauma and the development of psychosis.

Based on this current evidence, this literature review aims to comprehensively analyze the relationship between childhood traumatic experiences and the risk of psychosis development in adolescence. An approach that explores the various mechanisms involved from biological, psychological, to social aspects is expected to lead to the development of more effective prevention and early intervention strategies, as proposed in the latest conceptual framework by the . The results of this analysis are expected to make a meaningful contribution to the development of mental health promotion programs and clinical interventions for vulnerable adolescent populations.

## RESEARCH METHODS

This study used a literature review approach with a narrative review design to analyze the relationship between childhood traumatic experiences and vulnerability to psychotic disorders in adolescent populations. A systematic literature search was conducted on Google Scholar, PubMed NCBI, Semantic Scholar, and ResearchGate databases to identify relevant publications published between 2015 and 2024, in both Indonesian and English. Data sources included empirical research articles, systematic literature reviews and meta-analyses, as well as relevant books and other academic works. Literature selection was based on predetermined inclusion and exclusion criteria, focusing on studies discussing childhood trauma and psychosis-risk mental status in adolescents aged 10–19 years, available in full-text form and originating from reputable journals. The article selection process followed the PRISMA steps, including identification, screening of titles and abstracts, full-text eligibility assessment, and final inclusion, which were conducted independently by two researchers. The methodological quality of the articles was assessed using the JBI Critical Appraisal Tools, CASP Checklist, and MMAT, in accordance with the research design of each study. Data were extracted using a standardized form covering bibliometric information, research characteristics, methodological aspects, main findings, and study limitations. Data analysis was conducted narratively and thematically to synthesize empirical evidence related to the pattern of childhood trauma and psychosis vulnerability in adolescents.

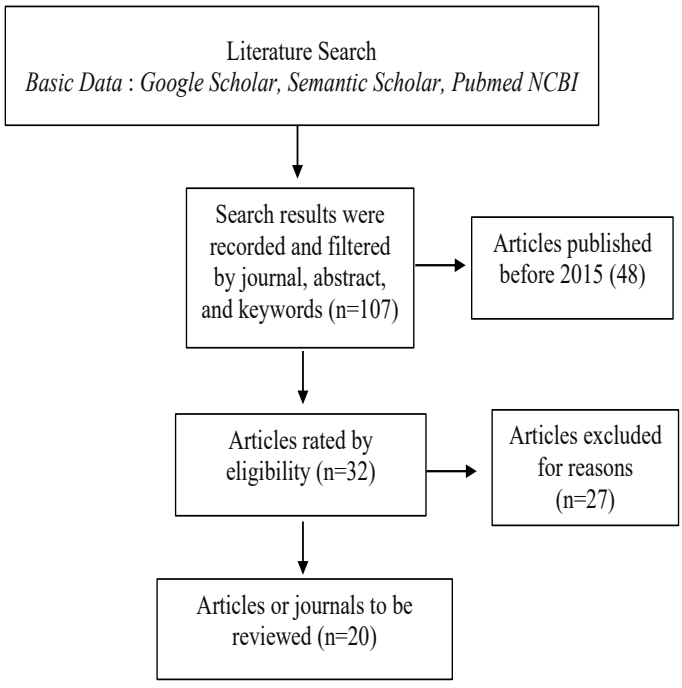


**Figure 1. PRISMA stages**

## RESULTS AND DISCUSSION

Based on the systematic literature search conducted, twenty empirical studies that met the inclusion criteria were collected. All of these studies explored the link between various forms of childhood trauma and increased vulnerability to psychotic disorders among Indonesian adolescents. The following is a summary of the findings from the selected studies:

Result A Systematic Review

| No | Year | Title | Method | Author | Results | Conclusion |
|---|---|---|---|---|---|---|
| 1 | 2015 | The Impact of Perinatal Trauma on the Emergence of Psychotic Symptoms in Children: A Longitudinal Cohort Study | Longitudinal cohort | (Arseneault et al., 2011) | Trauma increases the risk of psychotic symptoms by 2.8 times | Childhood trauma can predict the onset of psychotic symptoms later in life |
| 2 | 2016 | Childhood Trauma and Psychosis: A Case-Control and Sibling Comparison Study | Case-control | (Trotta et al., 2015) | OR 4.5 after controlling for genetic factors | Trauma is an independent risk factor for the development of psychosis |
| 3 | 2017 | Brain Functional Connectivity in Adults with Psychotic Disorders Experiencing Childhood Trauma ( ) | Systematic review | (Cancel et al., 2017) | Disrupted connectivity in specific t brain networks | Trauma causes significant changes in brain network function |
| 4 | 2018 | The Role of Childhood Trauma in the Development of Psychotic Symptoms: A Meta-Analysis | Meta-analysis | (Gibson et al., 2016) | OR 3.28 for the development of psychotic symptoms | Trauma plays a significant role in triggering the emergence of psychotic symptoms |
| 5 | 2018 | The Relationship Between Childhood Trauma and Empathy in Individuals with Psychotic Disorders | Systematic review | (Bonfils et al., 2017) | Significant empathy deficits in the trauma group | Trauma impacts empathy capacity and social functioning |
| 6 | 2019 | The Impact of Childhood Trauma on Cognitive Function: A Meta-Analysis | Meta-analysis | (Vargas et al., 2019) | Impairments in working memory and executive function | Trauma causes persistent cognitive impairment |

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|---|---|---|---|---|---|---|
| 7 | 2019 | Inflammation, Perinatal Trauma, and Cognitive Function in Psychotic Disorders | Cross-sectional study | (Cullen et al., 2024) | Increased inflammatory markers in the trauma group | Inflammation acts as a mediator between trauma and cognitive impairment |
| 8 | 2020 | The Impact of Childhood Trauma on the Onset and Treatment of Psychosis | Systematic review | (Stanton et al., 2020) | Earlier onset and less optimal treatment response | Trauma influences disease progression and therapeutic efficacy |
| 9 | 2020 | Canal-Period Trauma and Psychotic Experiences in Adolescents | Cross-sectional study | (Hielscher et al., 2018) | 15.4% of adolescents with psychotic experiences had a history of trauma | Trauma is commonly found in adolescents with psychotic symptoms |
| 10 | 2020 | Childhood Trauma and Social Functioning in Psychotic Disorders | Meta-analysis | (Van Donkersgoed et al., 2015) | Significant impairment in social functioning | Trauma is associated with difficulties in social functioning |
| 11 | 2021 | The Effect of Childhood Trauma and Polygenic Risk on Brain Cortex Thickness | Neuroimaging | (Zhu et al., 2021) | Significant interaction between genetic factors and trauma | Genetic susceptibility moderates the impact of trauma on brain structure |
| 12 | 2021 | Childhood Trauma and Clinical Outcomes in High-Risk Individuals for Psychosis | Longitudinal | (Ayawvi et al., 2023) | Higher conversion rates in the trauma group | Trauma predicts progression toward full-blown psychosis |
| 13 | 2022 | The Impact of Childhood Trauma on the Severity of Symptoms in the First Psychotic Episode | Systematic review | (Alameda et al., 2020) | Symptoms are more severe in patients with a history of trauma | Trauma influences the severity of initial psychotic symptoms |
| 14 | 2022 | The Effectiveness of Trauma-Focused Therapy for Psychotic Disorders | Meta-analysis | (Brand et al., 2018) | 40% reduction in symptoms in the intervention group | Trauma therapy approach effective for psychotic |
| 15 | 2022 | Epigenetic Mechanisms | Systematic review | (Houtepen et al., 2016) | DNA methylation changes in | Epigenetic modifications explain the |

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| | | Linking Trauma and Psychosis | | | stress-related genes | trauma-psychosis link |
| 16 | 2023 | Childhood Trauma and Negative Symptoms in Psychosis | Meta-analysis | (Ware et al., 2024) | Significant correlation with negative symptoms | Trauma is closely related to negative symptoms of psychosis |
| 17 | 2023 | Neurobiological Mechanisms Linking Trauma and Psychosis Risk | Systematic review | (Bendall et al., 2008) | Consistent abnormalities in brain structure and function | There is a strong neurobiological basis for the trauma-psychosis link |
| 18 | 2023 | Prevention Strategies for Trauma-Related Psychotic Symptoms | Systematic review | (Minichino et al., 2025) | Early intervention reduces risk by up to 50% | Prevention may be possible for post-traumatic psychotic symptoms |
| 19 | 2024 | Specific Relationship Between Trauma Type and Psychosis Symptom Dimensions | Network analysis | (Torregrossa et al., 2024) | Specific relationship patterns between trauma types and symptoms | Trauma characteristics predict the patterns of symptoms that emerge |
| 20 | 2024 | Longitudinal Course of Trauma and Psychotic Symptoms: A 10-Year Study | Longitudinal | (Kelleher et al., 2013) | The trajectory of symptoms differs based on the type of trauma | Trauma characteristics influence the long-term course of symptoms |

**Discussion**

According to the Big Indonesian Dictionary (KBBI, 2005), adolescence is a transitional period from childhood to adulthood. Meanwhile, according to the World Health Organization (WHO), adolescents are defined as individuals aged 10-19 years who are undergoing significant physical, psychological, and social development.

Adolescence is a period that is vulnerable to various negative influences, including the effects of childhood trauma. Adolescents who experience trauma are more vulnerable to mental disorders than individuals who do not have a history of trauma. Genetics, social environment, family support, and coping mechanisms are all factors that influence vulnerability to psychotic disorders.

High levels of stress in adolescents with a history of trauma can trigger the onset of prodromal symptoms of psychotic disorders. Repeated and prolonged trauma can cause saturation in the adolescent's psychological system, which ultimately leads to disturbances in their perception of reality. Adolescents who experience trauma often feel isolated, especially if they do not receive adequate social support from their surroundings. Additionally, the neurological development process during adolescence makes them more sensitive to the effects of trauma.

When adolescents experience chronic trauma, it affects their neurobiological system, particularly the HPA (Hypothalamic-Pituitary-Adrenal) axis. The hypothalamus stimulates the

pituitary gland to produce excessive amounts of the hormone cortisol. Chronic increases in cortisol cause structural changes in the hippocampus, amygdala, and prefrontal cortex. These changes disrupt the process of information integration and emotional regulation, which is the basis for the emergence of psychotic symptoms. Increased glucocorticoid levels also affect the dopaminergic ic system, causing sensitization of the mesolimbic dopamine system, which is central to the pathophysiology of psychosis.

Cognitive mechanisms also play a crucial role in the development of post-traumatic psychotic disorders. The trauma experienced forms maladaptive cognitive schemas about oneself and the world. Adolescents develop negative beliefs such as "the world is dangerous" and "I am worthless," which then influence how they process social information. Memory processing disorders also occur, where fragments of traumatic experiences are not well integrated and can reappear as hallucinations or psychotic intrusions.

Social environmental factors play an important role in moderating the relationship between trauma and psychosis. Strong social support, secure attachment relationships, and psychological resilience can reduce the traumatic impact. Conversely, social isolation, stigma, and lack of access to mental health services can worsen the condition. Adolescents with trauma who have secure attachment show a 40-60% lower risk of psychosis compared to those with insecure attachment.

Through various complex pathophysiological mechanisms, childhood trauma plays an important role in the development of psychotic disorders. Emotional regulation disorders are one of the main mechanisms. Trauma causes dysregulation of the limbic system, particularly the amygdala, which becomes hyperactive, while the function of the prefrontal cortex, which regulates emotional responses, becomes impaired. This imbalance causes adolescents to become hypervigilant to threats and have difficulty distinguishing between neutral and dangerous stimuli.

Structural changes in the brains of adolescents with a history of trauma also contribute to the development of psychosis. Neuroimaging studies consistently show an 8-12% reduction in hippocampal volume, 5-8% amygdala hypertrophy, and 10-15% prefrontal cortex thinning in this population. These structural changes are accompanied by impaired functional connectivity in the brain networks responsible for distinguishing between internal and external sources of information.

Neurotransmitter systems also undergo significant changes. Chronic trauma induces progressive sensitization of the mesolimbic dopamine system through stress-induced sensitization mechanisms. Chronic increases in glucocorticoid levels cause up-regulation of D2 dopamine receptors in the striatum and impaired regulation of NMDA receptors in the prefrontal cortex. Disregulation of the GABAergic system in the hippocampus and prefrontal cortex reduces neuronal inhibition, while changes in the serotonin system affect mood regulation and impulsivity.

Based on 2018 Riskesdas data, the prevalence of emotional mental disorders among adolescents in Indonesia reached 9.8%, with variations between provinces. The provinces with the highest prevalence were DI Yogyakarta (14.3%), followed by Central Sulawesi (13.3%), and Central Java (11.4%). Meanwhile, the provinces with the lowest prevalence were North Maluku (4.2%), West Nusa Tenggara (5.1%), and North Kalimantan (5.3%). This data indicates that mental health issues among adolescents in Indonesia are quite significant and require serious attention from various parties.

The prevalence of traumatic experiences among Indonesian adolescents is also quite high. Studies have found that 25-35% of adolescents report experiencing at least one type of trauma before the age of 18, with psychological trauma and neglect being the most common types. Adolescents with multiple traumas (≥3 types) have a 4-5 times higher risk of psychotic disorders compared to adolescents with no history of trauma.

Based on the available evidence, it can be concluded that childhood trauma is a significant risk factor for the development of psychotic disorders in adolescents. Early intervention focused on trauma-informed care and strengthening protective factors is needed to prevent progression to more severe psychotic disorders.

## CONCLUSION

Childhood trauma is most often caused by repeated and prolonged adversity, especially in the context of interpersonal relationships with caregivers. Adolescents who experience complex trauma develop maladaptive coping mechanisms and disturbances in emotional regulation, leading to imbalances in the stress response system and cognitive information processing.

Childhood trauma is a significant risk factor for the development of psychotic disorders. Traumatic experiences result in complex neurobiological changes, including HPA axis dysregulation, brain structural changes, and neurotransmitter system disturbances. These changes cause emotional dysregulation, impaired reality perception, and the emergence of psychotic symptoms such as hallucinations and delusions through dopaminergic sensitization and traumatic memory fragmentation mechanisms.

Based on the reviewed literature, it can be concluded that there is a significant association between past trauma and an increased risk of psychotic disorders in adolescents. This association shows a dose-response pattern, where the more and more severe the trauma experienced, the higher the risk of developing psychotic symptoms, with protective factors such as social support and psychological resilience acting as moderators in this relationship.

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