

# The Impact of Childhood Trauma on the Negative Symptoms of Schizophrenia

Katelyn Ware, MS,\* Blazej Misiak, PhD,† Eid Abo Hamza, PhD,‡§  
Shahad Nalla, PhD,|| and Ahmed A. Moustafa, PhD\*||¶

**Abstract:** Schizophrenia is a debilitating mental health disorder that imposes profound economic, societal, and personal burdens. The negative symptoms of schizophrenia (*i.e.*, blunted affect, alogia, anhedonia, asociality, and avolition) are highly prevalent and pervasive in the psychotic disorder and pose significant resistance to available treatment options. Traumatic childhood experiences are strongly linked with the risk of developing schizophrenia. Most prior studies have primarily focused on positive symptoms of schizophrenia (*e.g.*, hallucinations and delusions), whereas less attention has been given to negative symptoms. The current study investigated the relationship between childhood trauma (*i.e.*, physical abuse, sexual abuse, and emotional abuse and neglect) and negative symptoms in a sample of schizophrenia outpatients and healthy controls ( $n = 159$  participants, including 99 patients with schizophrenia). The observations from the current study revealed that schizophrenia patients experienced a significantly greater degree of childhood trauma and negative symptoms than the control individuals. The results of the current study also indicated that more severe experiences of total childhood trauma (*i.e.*, summation of all trauma types), physical abuse, and emotional neglect may increase the risk of schizophrenia patients reporting negative symptoms. However, childhood sexual and emotional abuse was found to have no impact on the degree of negative symptoms experienced by schizophrenia patients. Implications and limitations of the current study are discussed. In conclusion, we found that the severity of overall childhood trauma, physical abuse, and emotional neglect may play an important role in increasing the likelihood of schizophrenia patients reporting negative symptoms.

**Key Words:** Schizophrenia, negative symptoms, childhood trauma

(*J Nerv Ment Dis* 2024;00: 00–00)

Schizophrenia is a debilitating mental health disorder that is characterized by severe distortions to reality, cognition, behavior, emotions, language, and sense of self (Correll and Schooler, 2020). Schizophrenia is estimated to affect over 20 million people worldwide and is one of the main causes of disability (Inyang et al., 2022). Schizophrenia is typically diagnosed in late adolescence or early adulthood and imposes a tremendous societal and economic burden through health care costs and caregiver obligations (Onitsuka et al., 2022). In addition, individuals with schizophrenia may suffer profound personal impacts, including diminished quality of life due to unemployment, homelessness, and poverty (Stepnicki et al., 2018).

\*School of Psychology, Faculty of Society and Design, Bond University, Gold Coast, Queensland, Australia; †Department of Psychiatry, Wrocław Medical University, Wrocław, Poland; ‡Faculty of Education, Department of Mental Health, Tanta University, Tanta, Egypt; §College of Education, Humanities, and Social Sciences, Al Ain University, Al Ain, United Arab Emirates; ||Department of Human Anatomy and Physiology, the Faculty of Health Sciences, University of Johannesburg, Johannesburg, South Africa; and ¶Center for Data Analytics, Faculty of Society and Design, Bond University, Gold Coast, Queensland, Australia.

Send reprint requests to Ahmed A. Moustafa, PhD, Bond University, Gold Coast, Queensland, 4229, Australia. E-mail: amoustaf@bond.edu.au.

Supplemental digital content is available for this article. Direct URL citations appear in the printed text and are provided in the HTML and PDF versions of this article on the journal's Web site ([www.jonmd.com](http://www.jonmd.com)).

Copyright © 2024 Wolters Kluwer Health, Inc. All rights reserved.

ISSN: 0022-3018/24/0000-0000

DOI: 10.1097/NMD.0000000000001788

Individuals with schizophrenia typically present with a range of symptomatology that are categorized as positive, negative, and cognitive symptoms (Inyang et al., 2022). Positive symptoms of schizophrenia are defined as an excess or distortion of normal functioning, including hallucinations, delusions, and disorganized speech (Correll and Schooler, 2020). In contrast, negative symptoms are the lessening or absence of normal behaviors and functions (Galderisi et al., 2018). This includes blunted affect (*i.e.*, reduced observable emotional expression), alogia (*i.e.*, poverty of speech), anhedonia (*i.e.*, diminished capacity to experience pleasant emotions), asociality (*i.e.*, reduced interest and motivation for social contact), and avolition (*i.e.*, diminished initiation and persistence of goal-directed activity; Marder and Galderisi, 2017). Cognitive symptoms of schizophrenia include impaired mental functioning, for instance, disorganized thoughts, difficulty concentrating, and poor memory (Inyang et al., 2022). The severity of symptoms experienced by individuals with schizophrenia can vary greatly over the course of the disorder, including episodes of worsening and remission (Onitsuka et al., 2022). Past research has primarily focused on positive symptoms of schizophrenia (*e.g.*, hallucinations and delusions), whereas less attention has been given to negative symptoms (Grindey and Bradshaw, 2022; Isvoranu et al., 2017).

## NEGATIVE SYMPTOMS OF SCHIZOPHRENIA

Negative symptoms are highly prevalent in schizophrenia, occur at any point in the course of the illness, and are frequently reported as the first symptom during the prodromal phase of schizophrenia (Lyne et al., 2018). The prodromal onset of negative symptoms has been considered a risk factor for psychosis (Piskulic et al., 2012) and is associated with negative symptoms in the first psychotic episode (Lyne et al., 2013). Negative symptoms can be the primary symptomatology, which is intrinsic to the underlying presentation of schizophrenia, or secondary symptoms that are related to psychiatric or medical comorbidities, adverse treatment effects, or environmental factors (Correll and Schooler, 2020). One of the largest individual, controlled studies in schizophrenia ( $n = 1442$ ) found that 40% of patients experienced prominent negative symptoms (*i.e.*, measured as at least moderate severity on clinical instruments), 19% suffered predominant negative symptoms (*i.e.*, a greater degree of negative symptoms than positive symptoms) without prominent positive symptoms, and 21% had both prominent positive and negative symptoms (Rabinowitz et al., 2013a). The pervasiveness of negative symptoms was further demonstrated by a meta-analysis of 20 placebo-controlled studies ( $n = 7450$ ), which found that 62% of schizophrenia patients displayed prominent negative symptoms, whereas 50% were characterized as having predominant negative symptoms (Rabinowitz et al., 2013b). The severity of negative symptoms has been consistently linked to functional impairments, including occupational and academic performance, household integration, social functioning, participation in activities, and quality of life (Foussias et al., 2013).

The course of negative symptoms is unclear, with some studies suggesting relative stability of symptoms over time, whereas others have found that negative symptoms may fluctuate (Correll and Schooler, 2020). Although positive symptoms are often effectively

managed by psychopharmacological treatment (*i.e.*, antipsychotic medication), negative symptoms pose significant resistance to available treatment options (Stepnicki et al., 2018). Few studies have been prospectively designed to examine psychopharmacological treatment effectiveness on persistent negative symptoms, with most reported improvements being based on short-term studies in patients with acute psychotic illness and concurrent negative symptoms (Leucht et al., 2017; Möller and Czobor, 2015). Thus, it is unclear whether improvements in negative symptoms are a genuine treatment effect of medication, secondary to improvements in positive or cognitive symptoms, or related to extrapyramidal effects (Fusar-Poli et al., 2015).

## SCHIZOPHRENIA AND CHILDHOOD TRAUMA

The exact etiology of schizophrenia remains unknown but appears to be multifaceted (Isvoranu et al., 2017). The biopsychosocial model proposes that a complex interaction among biological, psychological, and sociological mechanisms may contribute to the onset and course of schizophrenia. The biopsychosocial framework conceptualizes schizophrenia by emphasizing the interplay between biological risk factors (*e.g.*, genetic susceptibility, brain structural abnormalities, inflammation responses, and immunological changes), cognitive processes (*e.g.*, anxiety, paranoia), behavioral mechanisms (*e.g.*, social withdrawal), and environmental factors (*e.g.*, illicit drug use, and adverse life events; Onitsuka et al., 2022).

Traumatic childhood experiences impose detrimental biopsychosocial impacts on an individual and have been extensively investigated as a potential risk factor for schizophrenia. Globally, approximately 25% of children encounter traumatic childhood experiences in their lifetime (Inyang et al., 2022). However, childhood trauma has varied descriptions throughout contemporary literature (Duhig et al., 2015). Many studies have defined childhood trauma as all forms of physical and emotional maltreatment, sexual abuse, neglect, or negligence (Letourneau et al., 2019). However, others have used broader definitions, including bullying, victimization, parental loss and separation, and household dysfunction (Spalletta et al., 2020). The current study defined childhood trauma as exposure to personal abuse or neglect before 18 years of age. This included the child or young person suffering physical abuse (*e.g.*, a physical assault that causes bruises or injury), sexual abuse (*i.e.*, attempted or sexual contact and/or sexual exploitation), emotional abuse (*e.g.*, constant criticism, humiliation, or unreasonable demands), and emotional neglect (*e.g.*, failure to have emotional needs met; Inyang et al., 2022).

Recent studies have demonstrated that individuals with schizophrenia are 2.7 times more likely to have experienced traumatic childhood experiences than healthy controls (Loewy et al., 2019). History of childhood maltreatment among schizophrenia patients is associated with an earlier age of onset (Alameda et al., 2015), greater hospital admissions (Álvarez et al., 2011), more persistent course of psychosis (Trotta et al., 2015), larger functional impairment (Alameda et al., 2015; Trotta et al., 2016), and higher rates of treatment resistance and drop out (Hassan and De Luca, 2014; Misiak and Frydecka, 2016; Schalinski et al., 2015). Among schizophrenia patients, childhood trauma is also associated with more severe psychotic episodes (Alameda et al., 2016; Grivel et al., 2018; Schalinski et al., 2015), greater likelihood of violent behavior (Spidel et al., 2010), elevated depressive and anxious symptoms (Alameda et al., 2016; Schäfer and Fisher, 2011), higher rates of suicidality (Grivel et al., 2018; Schäfer and Fisher, 2011), comorbid posttraumatic stress disorder (Schäfer and Fisher, 2011; Swan et al., 2017), and substance use disorders (Schalinski et al., 2015; Tomassi et al., 2017).

The exploration of mechanistic pathways that potentially explains the relationship between childhood maltreatment and schizophrenia is in its infancy (Isvoranu et al., 2017). The neural diathesis-stress model proposes that childhood trauma induces psychosocial stress, which interacts with preexisting vulnerabilities and triggers the

symptoms of schizophrenia via neurobiological, genetic, and epigenetic pathways (Popovic et al., 2019). Traumatic childhood experiences may cause structural and neurochemical abnormalities in the brain and nervous system, including limbic hyperresponsiveness and reduced hippocampal volume (Dannlowski et al., 2012). This may heighten the individual's stress response to negative stimuli (*e.g.*, facial expressions) and reinforce pessimistic beliefs about the self, others, and the world. These negative beliefs may subsequently lead to distressing interpretations of everyday events, ultimately resulting in psychotic symptoms (Isvoranu et al., 2017).

## NEGATIVE SYMPTOMS AND CHILDHOOD TRAUMA

Adverse experiences in childhood are strongly linked with the risk of developing schizophrenia (Grindey and Bradshaw, 2022). It is well established that trauma experienced in childhood is associated with the onset and course of positive symptoms, such as hallucinations and delusions (Akbej et al. 2019; Bailey et al., 2018; Chae et al. 2015; Duhig et al., 2015; Seidenfaden et al., 2016; Wang et al., 2013). However, one limitation of the existing literature is that it has primarily focused on positive symptoms, whereas less attention has been given to negative symptoms (Grindey and Bradshaw, 2022; Isvoranu et al., 2017). The lack of regard to investigating negative symptoms is perplexing given that these symptoms are highly prevalent, can be present at any point in the psychotic illness, have a poor prognosis, and display diminished responsiveness to treatment (an der Heiden et al., 2016; Correll and Schooler, 2020).

As mentioned above, negative symptoms include blunted affect, alogia, anhedonia, asociality, and avolition. Some prior studies have shown that childhood trauma impacts these processes in the general populations and patients with psychiatric disorders (Carvalho Fernando et al., 2014; Katembu et al., 2023; Lyons-Ruth and Block, 1996; Marusak et al., 2015; Schmitz et al., 2021). Given these findings, we predict that we may find similar findings to negative symptoms in schizophrenia.

The scarcity of literature investigating childhood trauma and negative symptoms has led to inconclusive findings. A preliminary study by Gallagher and Jones (2013) found a strong association between childhood neglect and negative symptoms, whereas childhood abuse was linked with positive symptoms. Based on this, the authors proposed that symptomatic responses in schizophrenia may differ based on the type of childhood trauma experienced. Extending on their earlier work, Gallagher and Jones (2016) demonstrated that the risk of negative symptoms was elevated for schizophrenia patients who suffered childhood neglect, particularly those with a family history of serious mental illness. Several studies have provided empirical support for different types of childhood trauma evoking specific psychotic symptoms (Grindey and Bradshaw, 2022). In relation to negative symptoms, significant associations have been found with overall childhood trauma (Akbej et al., 2019), childhood physical and emotional abuse (Longden et al., 2016), and have been suggested to have specific links with childhood neglect only (Bailey et al., 2018). A recent meta-analysis of 37 studies ( $n = 6053$ ; Alameda et al., 2021) demonstrated a relationship between overall childhood trauma, as well as childhood physical abuse, sexual abuse, and emotional neglect. Thus, the evidence surrounding negative symptoms continues to be unclear due to methodological problems with individual studies, including discrepant use of clinical measures and weak effects (Alameda et al., 2021; Bailey et al., 2018; Grindey and Bradshaw, 2022). The methodological problems include the following: 1) the lack of studies that examine all domestic challenges faced by the child including bullying, family disputes, and arguments; 2) the application of all instruments that are utilized during studies; in studies, only some instruments can be applied simultaneously during any particular study; 3) "real-life" experiences are not isolated and do not impact individuals; patients are at times

affected by multiple adversities that impact together on the psyche of that particular individual; thus, when doing searches, best to ensure as many adversities are covered; 4) searches need to have a certain methodological rigor to reduce time bias from impacting results (Alameda et al., 2021; Bailey et al., 2018).

## THE CURRENT STUDY

A compelling connection exists between neglect and the heightened severity of negative symptoms in individuals with schizophrenia. Given the varied findings in existing literature, the present study delved into exploratory investigations to unravel the intricate links between negative symptoms and various forms of childhood abuse, including physical, sexual, and emotional abuse. Due to the heterogeneity of findings in the current literature, the current study thus aimed to explore the relationship between traumatic childhood experiences and negative symptoms in a sample of schizophrenia outpatients and healthy controls. Specifically, group differences were examined regarding the degree of negative symptoms and experiences of total childhood trauma, as well as childhood trauma subtypes (*i.e.*, physical abuse, sexual abuse, emotional abuse, and emotional neglect).

It was expected that schizophrenia patients would experience a significantly greater degree of negative symptoms than healthy controls. Consequently, individuals with schizophrenia who have experienced emotional neglect may face difficulties in coping with stress and regulating emotions, leading to a worsening of their negative symptoms. It was also predicted that the schizophrenia group would report a significantly higher presence and severity of total childhood trauma than the control group. In addition, it was hypothesized that total childhood trauma and emotional neglect would be associated with schizophrenia patients suffering a significantly greater degree of negative symptoms. Furthermore, emotional neglect was expected to have the most notable impact on negative symptoms when compared with the other childhood trauma subtypes. Neglect appears to hinder the development of crucial skills for managing negative symptoms effectively, particularly in emotional regulation, social cognition, and self-esteem. Emotional neglect, in particular, emerges as a potent factor in exacerbating negative symptoms (Cohen et al., 2017; Hanson et al., 2015). These studies also showed that exposure to early neglect does pose risks for the subsequent development of internalizing symptoms and substance use behaviors among adolescents. Teicher et al. (2022) inform that utilizing conventional diagnostic categories together with capturing any early childhood ill-treatment or mental trauma should improve the ability to effectively diagnose and treat individuals with psychiatric disorders and to accelerate potential recovery.

## METHODS

### Participants

A total of 159 participants were included in the study. The subject sample consisted of clinically stable outpatients with schizophrenia ( $n = 99$ ) recruited at two university hospitals in Wrocław and Szczecin (Poland) as a convenience sample. Patients were enrolled in the study if they met the following inclusion criteria: 1) aged over 18 years; 2) diagnosis of schizophrenia based on the *DSM-IV* criteria that were validated using the Operational Criteria for Psychotic Illness checklist; and 3) maintenance of a stable antipsychotic regimen over a minimum 6-month period. Healthy controls ( $n = 60$ ) were recruited through community advertisements and had never received a psychiatric diagnosis or treatment, confirmed using the screening questions from the Mini International Neuropsychiatric Interview (M.I.N.I.). The control group also had no first- or second-degree relatives who were affected by psychotic or affective disorders. Participants were administered clinical assessments via multiple interviews that were conducted by appropriately trained, board-certified psychiatrists. Participant groups were matched

by age, gender, and level of parental education (used as a proxy measure of socioeconomic status).

### Procedure

The Bioethics Committees at Wrocław Medical University (Wrocław, Poland) and Pomeranian Medical University (Szczecin, Poland) provided initial ethics approval for the project. The Bond University Human Research Ethics Committee (Queensland, Australia) subsequently approved the current study to proceed. All subjects provided informed written consent for participation in the study and agreed for the data to be used as part of a wider investigation regarding schizophrenia. The current study builds on data already collected and published (Misiak et al., 2023a; Misiak et al., 2023b; Misiak et al., 2023c; Samochowiec et al., 2023).

Participants were enrolled through the snowball sampling method implemented in social media and survey Web sites. They were informed about confidentiality and anonymous character of the survey. Enrollment was carried out among inhabitants of three large Polish cities (Szczecin, Warsaw, and Wrocław).

## Clinical Measures

### Negative Symptomology

The Self-Evaluation of Negative Symptoms (SNS) was administered to the schizophrenia and control groups to measure self-reported negative symptoms (Dollfus et al., 2016; Wójciak et al., 2019). The SNS is a 20-item self-assessment questionnaire that evaluates the five domains of negative symptoms, including social withdrawal, diminished emotional range, avolition, and anhedonia. The SNS has shown good psychometric properties when used with stable outpatients with schizophrenia.

The Positive and Negative Syndrome Scale (PANSS; Kay et al., 2009) was administered to the schizophrenia group to assess clinician-rated negative symptoms. The PANSS is a semistructured interview that measures the severity of 30 schizophrenia symptoms categorized into positive, negative, and general psychopathological manifestations over the past week. The PANSS–Negative Subscale (PANSS-NS) consists of seven items: blunted affect, emotional withdrawal, poor rapport, passive social withdrawal, difficulty in abstract thinking, lack of spontaneity and flow of conversation, and stereotyped thinking. The PANSS is a well-established scale for assessing patients with schizophrenia (Obermeier et al., 2011) and has demonstrated excellent psychometric properties for evaluating schizophrenia symptoms (Kay et al., 1988; Peralta and Cuesta, 1994).

### Childhood Trauma

The Traumatic Experiences Checklist (TEC; Nijenhuis et al., 2002) was administered to evaluate the degree of childhood trauma experienced by schizophrenia patients and controls. The TEC is a self-report questionnaire that enquires about an individual's experience of 29 types of potential trauma. The TEC items are aligned with diagnostic criterion A for posttraumatic stress disorder (*i.e.*, the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others; American Psychiatric Association, 2013, p 271). The TEC was used to evaluate events experienced by participants involving physical abuse, sexual abuse, emotional abuse, and emotional neglect. The TEC specifically addresses the presence, age, setting (*i.e.*, relationship to the perpetrator), duration, and subjective distress associated with the trauma (on a 5-point Likert scale). The TEC is a reliable and valid instrument for assessing traumatic experiences and can be used in clinical practice and research (Nijenhuis et al., 2002).



## Procedure for the Analysis of Results

Childhood trauma presence and severity scores were calculated for each participant based on their responses to the TEC for the four childhood trauma types (Nijenhuis et al., 2002). This included physical abuse (*i.e.*, bodily assault or harm, intentional threat to life, bizarre punishment, or intense pain), sexual abuse (*i.e.*, attempted or sexual contact and harassment), emotional abuse (*i.e.*, excessive criticism or humiliation), and emotional neglect (*i.e.*, failure to have emotional needs met). The total childhood trauma presence scores were calculated for each participant by summing their presence scores for the four trauma types. Childhood trauma severity scores were calculated for each trauma type based on a composite of five variables: 1) presence of the event, 2) age of onset, 3) relationship to the perpetrator, 4) duration of the trauma, and 5) emotional impact associated with the trauma. The total childhood trauma severity scores were calculated for each participant based on a summation of the severity scores for the four trauma types. Table 1 outlines the scoring procedure applied to calculate the childhood trauma variables (Nijenhuis et al., 2002). All statistical analyses were performed using the statistical package SPSS version 28. Demographic and clinical variables were investigated by independent samples *t*-tests and correlational analyses. Group differences in negative symptoms, total childhood trauma, and each trauma type were analyzed using the Mann-Whitney *U*-test due to violated homogeneity of variance. All tests were two-tailed with an alpha threshold of 0.05.

## RESULTS

### Demographic Variables

The schizophrenia group ( $n = 99$ ) consisted of 63 males (63.6%) and 36 females (36.4%) with a mean age of 45.58 years ( $SD = 13.07$ ; range, 19–71 years). The control group ( $n = 60$ ) comprised 39 males (65%) and 21 females (35%) with a mean age of 44.65 years ( $SD = 14.17$ ; range, 21–68 years). The highest educational level completed by parents of the schizophrenia group was predominantly primary (27%) and secondary (27%), followed by vocational (24%), and higher education (22%). The highest level of education attained by parents of the control group was secondary (43%), followed by vocational (31%), primary (15%), and higher education (11%). There were no significant group differences in age,  $t(157) = 0.42, p = 0.68$ , gender,  $t(157) = 0.17, p = 0.86$ , or parent's education level,  $t(145) = -0.46, p = 0.65$ .

### Group Differences in Negative Symptoms of Schizophrenia

Table 2 presents the mean group scores for the clinical measures of negative symptoms. A Mann-Whitney *U*-test was conducted to examine group differences in negative symptoms between the schizophrenia and control groups. Based on the SNS, results revealed that the schizophrenia group self-reported significantly more negative symptoms than healthy controls (see Figure 1). The PANSS-NS was not administered to the control group; thus, clinician-reported group differences were unable to be examined.

### Group Differences in Childhood Trauma

Mann-Whitney *U*-tests were conducted to investigate group differences in the presence and severity of total childhood trauma and each trauma type. Compared with the control group, findings indicated that schizophrenia patients reported significantly greater presence and severity of total childhood trauma, physical abuse, emotional abuse, and emotional neglect (see Table 3 and Figure 2). Results demonstrated nonsignificant group differences regarding the severity of childhood sexual abuse.

### Childhood Trauma and Negative Symptoms

Statistical analyses were performed to examine the concurrent validity of the SNS and PANSS-NS in the schizophrenia group. The SNS and PANSS-NS were found to be significantly and moderately correlated,  $r(97) = 0.46, p < 0.001$ . A paired samples *t*-test showed no significant difference in self- and clinician-reported negative symptoms between the SNS ( $M = 15.83, SD = 9.99$ ) and the PANSS-NS ( $M = 16.24, SD = 8.03$ ),  $t(98) = 0.43, p = 0.67$ .

### Self-Evaluation of Negative Symptoms

Based on the SNS, correlational analyses were conducted to examine the association between negative symptoms reported by schizophrenia patients and the presence and severity of total childhood trauma, and each trauma type (see Supplementary Material, Table S1, <http://links.lww.com/JNMD/A184>). Findings indicated that negative symptoms had weak, positive correlations with the severity of total childhood trauma,  $r(97) = 0.27, p = 0.006$ , severity of childhood physical abuse,  $r(97) = 0.24, p = 0.02$ , as well as emotional neglect at a presence,  $r(97) = 0.24, p = 0.02$ , and severity level,  $r(97) = 0.23, p = 0.02$  (see Figure 3). *Z*-scores were calculated and revealed nonsignificant differences in correlational strength between these variables (see Supplementary Material, Table S2, <http://links.lww.com/JNMD/A184>).

**TABLE 1.** Scoring Procedure for the Presence and Severity of Childhood Trauma

Variable	Score		
	2	1	0
Presence of childhood trauma	-	Presence of childhood trauma	
		Event occurred prior to age 18	Event did not occur or occurred later than age 18
Age of childhood trauma onset	Event occurred prior to age 6	Severity of childhood trauma	
		Event occurred between ages 7 and 17	Event occurred later than age 18
Relationship to perpetrator of childhood trauma		Event perpetrated within the family of origin	Event perpetrated outside the family of origin
Duration of childhood trauma		Event persisted longer than 1 year	Event lasted less than 1 year
Emotional impact of childhood trauma on the participant		Subjective distress rated as 3 or higher (5-point Likert scale)	Subjective distress rated as 2 or lower (5-point Likert scale)

Downloaded from <http://journals.lww.com/jonmd> by BhdMf6eP4Kav1Eoum1tQn4a+kLHEZgpsiH04XMI0hCwCk1A on 08/09/2024

**TABLE 2.** Means and Standard Deviations of Negative Symptoms by Group

Variable	Group		U
	Schizophrenia	Control	
SNS	M (SD) 15.83 (9.99)	M (SD) 0.32 (0.81)	174.5 <sup>a</sup>
PANSS-NS	M (SD) 16.24 (8.03)	-	-

<sup>a</sup> Significant at  $p < 0.001$  level (2-tailed).

No significant correlations were found between negative symptoms reported by schizophrenia patients and the presence of total childhood trauma,  $r(97) = 0.11, p = 0.30$ , and physical abuse,  $r(97) = 0.12, p = 0.23$ . Childhood sexual abuse (presence,  $r(97) = 0.04, p = 0.69$ , severity,  $r(97) = 0.01, p = 0.96$ ) and emotional abuse (presence,  $r(97) = 0.15, p = 0.15$ , severity,  $r(97) = 0.16, p = 0.11$ ) also had nonsignificant relationships with self-reported negative symptoms.

**Positive and Negative Syndrome Scale–Negative Subscale**

Based on the PANSS-NS, findings showed no significant correlations between negative symptoms assessed by clinicians and total childhood trauma (presence,  $r(97) = -0.10, p = 0.35$ , severity,  $r(97) = -0.01, p = 0.90$ ), physical abuse (presence,  $r(97) = -0.02, p = 0.86$ , severity,  $r(97) = 0.05, p = 0.61$ ), sexual abuse (presence,  $r(97) = -0.19, p = 0.06$ , severity,  $r(97) = 0.19, p = 0.06$ ), emotional abuse (presence,  $r(97) = 0.02, p = 0.87$ , severity,  $r(97) = 0.01, p = 0.96$ ), or emotional neglect (presence,  $r(97) = 0.02, p = 0.84$ , severity,  $r(97) = -0.02, p = 0.87$ ).

**DISCUSSION**

The current study investigated the relationship between childhood trauma and negative symptoms in a sample of schizophrenia outpatients. The method applied was the utilization of structured clinical evaluations such as SNS and PANSS on a sample of patients as well as on a control group at two Polish hospitals. Findings suggest that experiences of childhood trauma, particularly the severity of the trauma, may increase the likelihood of schizophrenia outpatients suffering negative symptoms in adulthood. Compared with healthy controls, findings demonstrate that schizophrenia patients experienced significantly more negative symptoms. In addition, schizophrenia patients reported a greater degree of childhood trauma than the control group, including physical abuse, sexual abuse, emotional abuse, and emotional neglect. Findings indicate that more severe experiences of total childhood trauma, physical abuse, and emotional neglect may put schizophrenia

patients at increased risk of experiencing negative symptoms, whereas childhood sexual and emotional abuse may have no impact on negative symptoms. Notably, findings illustrate that the mere presence of emotional neglect, as well as the severity, may impact the degree of negative symptoms reported by schizophrenia outpatients.

**Group Differences in Negative Symptoms**

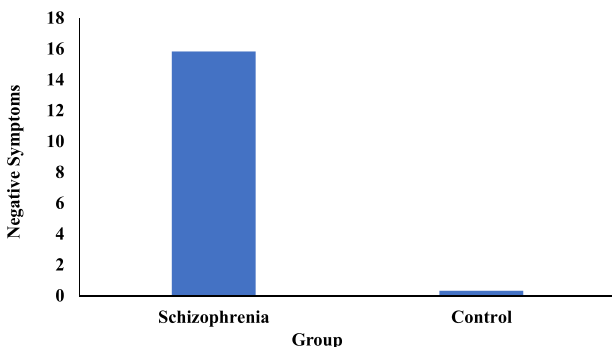
The current study predicted that schizophrenia patients would experience a greater degree of negative symptoms than healthy controls. As expected, the schizophrenia group reported significantly more negative symptoms than the control group. Consistent with the literature, the current study demonstrates the prevalent and pervasive nature of negative symptoms experienced by schizophrenia patients (Correll and Schooler, 2020; Lyne et al., 2018; Rabinowitz et al., 2013a; Rabinowitz et al., 2013b). This emphasizes the profound burden of negative symptoms on those suffering from schizophrenia and their predicted poor treatment responses and functional outcomes (Carbon and Correll, 2014; Foussias et al., 2013). This demonstrates the importance of effectively screening and identifying negative symptoms in patients presenting with schizophrenia to promote informed intervention and better treatment outcomes.

**Group Differences in Childhood Trauma**

The current study hypothesized that the schizophrenia group would experience a greater degree of total childhood trauma than the control group. Consistent with predictions, schizophrenia patients reported a significantly greater presence and severity of overall childhood trauma than healthy controls. When examining specific trauma types, schizophrenia patients reported suffering significantly more presence and severity of childhood physical abuse, emotional abuse, and emotional neglect than healthy controls. Schizophrenia patients also reported a significantly higher presence of childhood sexual abuse. This supports existing literature and illustrates that those with schizophrenia have a greater likelihood of having suffered traumatic experiences during childhood (Grindey and Bradshaw, 2022; Loewy et al., 2019). Identifying trauma-related mechanisms that underlie the development of negative symptoms may help to inform clinical practice and strengthen the trauma-informed assessment of schizophrenia patients (Bailey et al., 2018). There is strong support that schizophrenia patients with histories of childhood maltreatment have distinct clinical characteristics and treatment needs that differentiate them from patients without histories of childhood trauma (Kaufman and Torbey, 2019). This includes poor psychosocial functioning and complex needs (Turner et al., 2020). Thus, trauma-informed practice may help clinicians formulate more comprehensive and appropriate psychosocial treatment plans for patients with schizophrenia (Correll and Schooler, 2020). Furthermore, given that negative symptoms often emerge several years before the individual's first acute psychotic episode (Galderisi et al., 2018), immediate recognition of childhood trauma may provide greater opportunities for early intervention during the prodromal period and improve treatment outcomes.

**Total Childhood Trauma and Negative Symptoms**

The current study predicted that more experiences of total childhood trauma would be associated with schizophrenia patients suffering a greater degree of negative symptoms. Consistent with expectations, the current study found that greater severity of total childhood trauma, but not presence alone, was associated with schizophrenia patients reporting significantly more negative symptoms. The findings in the current study are consistent with literature that demonstrates the link between overall childhood trauma and negative symptoms (Akbej et al., 2019; Alameda et al., 2021). Findings indicate that the age of onset, relationship to the perpetrator, duration, and subjective emotional impact of the childhood trauma on the individual may play an important role in



**FIGURE 1.** Mean Self-Evaluation of Negative Symptoms scores by group.

Downloaded from http://journals.lww.com/jonmd by BhdMfGepPhKav1EoumTtQmNah-kJLhEZgpsiHo4XMI0hCymCk1A on 08/09/2024

**TABLE 3.** Means and Standard Deviations of Childhood Trauma by Group

Variable	Group		U
	Schizophrenia	Control	
	M (SD)	M (SD)	
Presence			
Total childhood trauma	4.69 (4.16)	1.22 (1.26)	1242 <sup>a</sup>
Childhood physical abuse	0.86 (1.20)	0.17 (0.42)	1958 <sup>a</sup>
Childhood sexual abuse	0.20 (0.59)	0.02 (0.13)	2627 <sup>b</sup>
Childhood emotional abuse	0.58 (0.85)	0.05 (0.22)	1983 <sup>a</sup>
Childhood emotional neglect	0.74 (1.06)	0 (0)	1740 <sup>a</sup>
Severity			
Total childhood trauma	5.29 (8.23)	0.45 (1.60)	1997.5 <sup>a</sup>
Childhood physical abuse	1.42 (3.05)	0.03 (0.26)	2387.5 <sup>b</sup>
Childhood sexual abuse	0.17 (0.64)	0.03 (0.26)	2808
Childhood emotional abuse	1.21 (2.64)	0.12 (0.58)	2408 <sup>b</sup>
Childhood emotional neglect	2.18 (3.98)	0.07 (0.25)	2272 <sup>a</sup>

<sup>a</sup> Significant at  $p < 0.001$  level (2-tailed).

<sup>b</sup> Significant at  $p < 0.01$  level (2-tailed).

the degree of negative symptoms experienced by schizophrenia patients. This highlights the clinical relevance of using comprehensive, validated measures to evaluate childhood trauma, particularly the severity of the trauma when assessing schizophrenia patients and their treatment needs.

### Childhood Physical Abuse and Negative Symptoms

The current study conducted exploratory analysis to examine the relationship between childhood physical abuse and negative symptoms. Findings from the exploratory investigation revealed that more severe experiences of childhood physical abuse, but not presence alone, were associated with schizophrenia patients reporting significantly more negative symptoms. This is consistent with previous literature (Alameda et al., 2021; Longden et al., 2016) and provides further support regarding the effect of childhood abuse on the degree of negative symptoms. Findings suggest that the severity of childhood physical abuse (*i.e.*, age, relationship to the perpetrator, duration, and subjective impact) may play a greater role in the degree of negative symptoms reported by schizophrenia patients, as opposed to the presence of physical

abuse only. This further supports the necessity to evaluate the severity of childhood trauma when conducting clinical assessments of schizophrenia patients to inform treatment.

### Childhood Sexual Abuse and Negative Symptoms

The current study conducted further exploratory investigations into the associations between childhood sexual abuse and negative symptoms. Findings showed no significant associations between the presence or severity of childhood sexual abuse and negative symptoms reported by schizophrenia patients. The current finding may reflect the weak or nonexistent relationships found regarding childhood sexual abuse. For instance, although schizophrenia patients reported experiencing a significantly higher presence of childhood sexual abuse, this association was weak. Furthermore, contrasting previous literature (Devi et al., 2019), no significant difference in the severity of childhood sexual abuse was found between the schizophrenia group and healthy controls. Notably, participant reports of childhood sexual abuse in the current sample are lower than those reported in the literature. For instance, Devi et al. (2019) found that 25.3% of schizophrenia outpatients ( $n = 91$ ) reported having experienced childhood sexual abuse, whereas a community survey of 1760 Polish adults estimated the prevalence of childhood sexual abuse as 5% (Makaruk et al., 2018). Although the current findings may represent a genuine difference, it is more likely to reflect participant underreporting due to the cultural taboos and stigma that surround childhood sexual abuse (Rajkumar, 2015). Research based on the World Health Organization's Mental Health Surveys revealed that sexual victimization demonstrates the strongest link with psychopathology when compared with all other trauma types (Kessler et al., 2017). However, it is estimated that between 70% and 90% of sexual abuse cases remain undetected in mental health care practices (Zarchev et al., 2022). Thus, this contributes to a widespread cycle of underreporting and undertreatment of sexual trauma related to psychiatric illnesses.

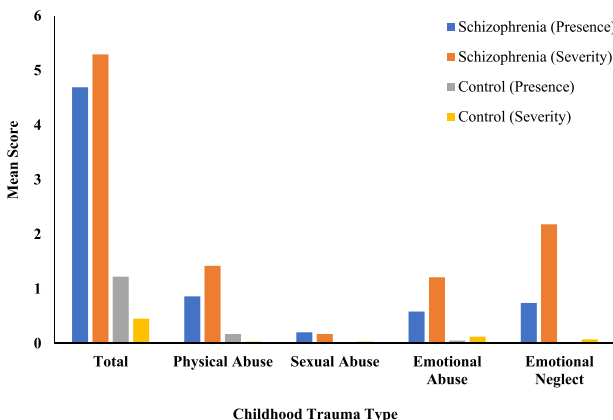
### Childhood Emotional Abuse and Negative Symptoms

Additional exploratory analysis in the current study demonstrated no significant relationship between childhood emotional abuse and negative symptoms. This is consistent with the literature and provides further evidence that childhood emotional abuse may not impact negative symptoms experienced by schizophrenia patients (Alameda et al., 2021; Rajkumar, 2015). This indicates that schizophrenia patients who suffer emotional abuse during childhood are at no greater risk of experiencing negative symptoms in adult life.

### Childhood Emotional Neglect and Negative Symptoms

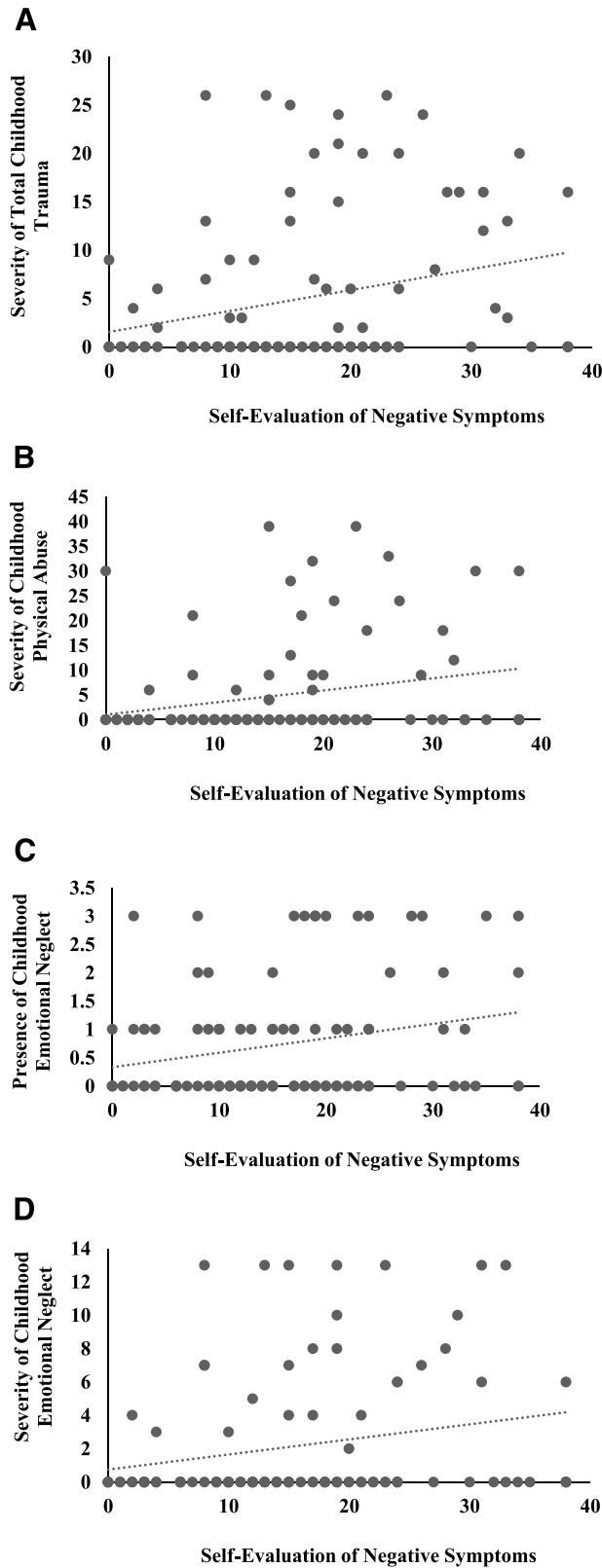
The current study hypothesized that more experiences of childhood emotional neglect would be associated with schizophrenia patients suffering a greater degree of negative symptoms. As predicted, findings suggest that experiences of childhood emotional neglect significantly increased the likelihood of schizophrenia patients reporting negative symptoms. This finding was evident in both the presence and severity of childhood emotional neglect. This is consistent with meta-analyses that revealed childhood neglect to strongly influence negative symptoms (Alameda et al., 2021; Bailey et al., 2018). The current study did not investigate positive symptoms; however, findings provide further evidence that emotional neglect experienced during childhood may have specific effects on negative symptoms (Gallagher and Jones, 2013, 2016). This emphasizes the importance of furthering our understanding of the pathways that link childhood emotional neglect and negative symptoms to better inform clinical assessment and treatment of schizophrenia.

Related to the previous hypothesis, childhood emotional neglect was predicted to have the most notable impact on negative symptoms when compared with the other childhood trauma subtypes (*i.e.*,



**FIGURE 2.** Presence and severity of childhood trauma by Group.

Downloaded from http://jnm.sagepub.com at National Institute of Mental Health on 08/09/2024



**FIGURE 3.** A, Relationship between severity of total childhood trauma and Self-Evaluation of Negative Symptoms scores. B, Relationship between severity of childhood physical abuse and Self-Evaluation of Negative Symptoms scores. C, Relationship between presence of childhood emotional neglect and Self-Evaluation of Negative Symptoms scores. D, Relationship between severity of childhood emotional neglect and Self-Evaluation of Negative Symptoms scores.

Downloaded from http://journals.lww.com/jonmd by BhdMf5epHKav1 zEoum1t1QIN4a+kKJLHEZgpsiH04XXM10hCywCX1A WNYQp/IOHrHD3ID00RyY7TtVsf14Cf3Vc1Y0abgqZXd9Gj2MwZLel= on 08/09/2024



childhood physical, sexual, and emotional abuse). As outlined above, the presence and severity of childhood emotional neglect were found to significantly increase the degree of negative symptoms reported by schizophrenia patients. In contrast, the presence and severity of sexual and emotional abuse, and the presence of physical abuse, had nonsignificant relationships with negative symptoms. Consistent with previous research (Bailey et al., 2018; Gallagher and Jones, 2013, 2016), this provides partial support for the hypothesis and indicates that being subjected to childhood emotional neglect may elevate the risk of experiencing negative symptoms, compared with schizophrenia patients who have suffered childhood physical, sexual, or emotional abuse.

However, contrary to expectations, findings demonstrate no meaningful difference in the strength of the relationship among negative symptoms, the presence or severity of childhood emotional neglect, and the severity of childhood physical abuse. This is consistent with Alameda et al. (2021) and constrains the conclusions that can be drawn regarding the differing impacts of childhood emotional neglect and physical abuse on negative symptoms. Based on the findings in the current study, it may be deduced that the severity of physical abuse and the presence and severity of emotional neglect may be equally influential on the degree of negative symptoms reported by schizophrenia patients. This reinforces the importance of comprehensively assessing childhood abuse and neglect when administering assessments to schizophrenia patients in clinical settings.

### Self- Versus Clinician-Reported Negative Symptoms

Despite the apparent concurrent validity between the SNS and PANSS-NS, the current study yielded conflicting findings based on self- versus clinician-reported negative symptoms. For example, findings in the current study demonstrated no relationship between clinician-reported negative symptoms and the severity of overall childhood trauma or physical abuse, as well as the presence or severity of emotional neglect. A possible explanation for these unanticipated findings is that negative symptoms are internal experiences and, thus, may more accurately be represented via self-report rather than clinician- or informant-based observations (Faerden et al., 2018; Galderisi et al., 2018; Marder and Galderisi, 2017). Furthermore, psychiatric assessments may typically focus on identifying and evaluating positive symptoms (e.g., hallucinations and delusions) due to their prominence and overt functional impairment (Correll and Schooler, 2020). Patients themselves rarely present with negative symptom complaints, thus, positive symptoms appear to take precedence over the negative symptom burden. Consequently, covert and emergent negative symptoms may be overlooked by clinicians during psychiatric interviews. Some literature suggests that severely ill schizophrenia patients have limited insight regarding symptomology and, thus, find it difficult to accurately report negative symptoms (Correll and Schooler, 2020). However, findings in the current study are in line with research that indicates the subjective evaluation of negative symptoms by schizophrenia patients may complement clinical observations and informant-report (Dollfus et al., 2016; Marder and Galderisi, 2017; Ohata et al., 2014).

The impact of childhood abuse and neglect may vary in individuals with neurotic and psychotic disorders. Studies have shown that a considerable number of people diagnosed with schizophrenia have encountered significant trauma, both preceding and following the onset of their condition. The prevalence of substantial trauma symptoms in schizophrenia, their co-occurrence, and their correlation with positive and negative symptoms remain uncertain. Investigations indicate that individuals with schizophrenia spectrum disorders frequently report a notable incidence of exposure to traumatic events. Exploring the psychological and biological mechanisms through which childhood trauma heightens the risk of developing psychosis is essential, as suggested by research.

### Limitations

The current study was subject to certain limitations. First, statistical analyses were restricted due to being based on secondary analysis of data collected as part of a wider investigation into schizophrenia. Thus, examination of variables of interest (e.g., prominent and predominantly negative symptoms) was unable to be performed. In addition, information regarding the number of participants that were approached and subsequently accepted, declined, or discontinued in the original data collection stage was unable to be obtained. This may be particularly problematic in childhood trauma studies as participants may be biased toward or against participating in trauma-related research due to emotional reactions to their traumatic experiences (Bailey et al., 2018). In addition, the PANSS-NS was not administered to healthy controls, which impeded investigation of clinician-reported data for the whole sample. Potentially threatening validity, the current study did not control for confounding variables commonly associated with childhood trauma and schizophrenia (e.g., comorbid depression and substance misuse; Grindey and Bradshaw, 2022). Also, the significant associations found between variables were weak, and the sample size was modest, further undermining internal and external validity. Furthermore, the current study involved a sample of Polish schizophrenia outpatients; therefore, findings may not be generalizable to other clinical settings or populations.

Further limitations involved the suggestion that the PANSS-NS may conceptualize negative symptoms differently than other validated clinical instruments (Marder and Galderisi, 2017). This is based on its inclusion of items that are no longer considered relevant to the negative symptom domain (e.g., difficulties in abstract and stereotyped thinking) and exclusion of relevant aspects (e.g., avolition and anhedonia). The PANSS-NS may also have problems due to its reliance on assessing observable performance and behavior (e.g., deficits in an emotional expression), rather than internal or subjective experiences (Garcia-Portilla et al., 2015). Potential underrecognition of negative symptoms may play a role in their pronounced burden and the limited availability of efficacious treatment options (Kessler et al., 2017).

The current study was unable to determine the causality between childhood trauma and negative symptoms given the method of statistical analysis (i.e., correlational) and data being collected at a single time point. The current study's failure to measure childhood physical neglect is also problematic and hinders the comparability of findings with that noted in the literature. In addition, childhood trauma was reported retrospectively by those suffering from psychotic illness, thus, may be compromised by recall error and resulted in overreporting or underreporting (Mørkved et al., 2017; Reuben et al., 2016). However, previous research has demonstrated that retrospective reporting of childhood trauma by psychosis patients is typically reliable and unaffected by current symptoms (Fisher et al., 2014; Gayer-Anderson et al., 2020). Another issue arises with the reductionist process that the current study, and most trauma-related research, employed during the "preprocessing" of the childhood trauma data (Popovic et al., 2019). This includes categorizing traumatic childhood experiences into overarching trauma types (i.e., physical and sexual abuse, emotional abuse, and neglect) and calculating summed scores based on whether the trauma was present or absent. This removes a vast amount of variance and heterogeneity within the data set that could be important for analyses.

### Recommendations for Future Research

It is recommended that future studies use homogenous measures of negative symptoms. For instance, the Brief Negative Symptom Scale (Kirkpatrick et al., 2011) and Clinical Assessment Interview for Negative Symptoms (Kring et al., 2013) are currently considered the gold standard of clinical instruments for the assessment of negative symptoms (Marder and Galderisi, 2017). The use of the PANSS-Negative Factor may also be preferred based on its strong psychometric



properties for evaluating highly relevant symptoms identified as part of the negative symptom domain (Garcia-Portilla et al., 2015). This includes five items from the negative subscale (*i.e.*, blunted affect, emotional withdrawal, poor rapport, social withdrawal, and lack of spontaneity/flow of conversation) and two items from the general psychopathology subscale (*i.e.*, motor retardation and active social avoidance). Further research should also consider the examination of negative symptoms as primary (*i.e.*, prominent and predominant) or secondary symptomatology. This would help to deepen our understanding of the potential impact of childhood trauma on the presenting characteristics of negative symptoms. In addition, all measures of negative symptoms should be administered to both the clinical and healthy participants to enable thorough comparisons between the clinical population and appropriately matched controls. Potential confounding variables should also be controlled to strengthen the conclusions drawn from the research.

Future research may also benefit from the use of childhood trauma assessments that include the measurement of childhood physical neglect. For instance, the Childhood Trauma Questionnaire (Bernstein et al., 1994) is one of the most widely used instruments to assess childhood trauma and assesses a broad range of traumatic childhood experiences (Storvestre et al., 2020). This includes physical, sexual, and emotional abuse, physical and emotional neglect, and related aspects of the child-rearing environment. Previous research has demonstrated links between childhood physical neglect and negative symptoms (Rajkumar, 2015). Thus, the inclusion of childhood physical neglect in future research may provide valuable insight into its relationship with negative symptoms.

Prospective, longitudinal research using a large sample of high-risk, maltreated children is needed to better understand the directionality of the relationship between childhood trauma and negative symptoms. It may be that suffering with negative symptoms promotes schizophrenia patients to have a bleaker outlook regarding their childhood experiences, and thus, makes them more susceptible to report a greater degree of childhood trauma. In addition, the field of research into childhood trauma is a highly dynamic phenomenon in which various risk and protective factors interact with each other and produce complex clinical presentations (Popovic et al., 2019). Thus, further research investigating individual differences, including mediating and moderating factors (*e.g.*, attachment, family history of serious mental illness), is also warranted (Bailey et al., 2018; Mørkved et al., 2017).

## SUMMARY AND CONCLUSIONS

The findings of the current study suggest a potential link between childhood trauma and negative symptoms in a sample of schizophrenia outpatients. Specifically, findings indicate that the severity of overall childhood trauma, physical abuse, and emotional neglect may play an important role in increasing the likelihood of schizophrenia patients reporting negative symptoms. Notably, the findings of the current study reveal that the mere presence of childhood emotional neglect may increase the risk of negative symptoms for schizophrenia patients in later life. Findings lend support to the diathesis-stress model and suggest that childhood trauma may elevate the likelihood of schizophrenia patients experiencing negative symptoms in later life. This has important implications for screening, treating, and mitigating negative symptoms and indicates that greater attention should be dedicated to obtaining thorough trauma histories among individuals with schizophrenia (Chae et al., 2015; Inyang et al., 2022). In sum, the results of this study highlight the strong links that exist between the lived experiences of schizophrenia patients, especially during their childhood years. These are critical times of the development of an individual's personality. Thus any trauma experienced, be it physical or mental, will have an impact that presents itself clinically as negative symptoms presented as mental and neurophysiological coupled with emotional difficulties and

challenges. The intrinsic response to the degree of trauma and abuse experienced manifests itself in direct proportionality to the negative symptoms elicited.

The formulation of comprehensive, trauma-informed treatment plans by mental health clinicians may enhance the therapeutic response to negative symptoms and strengthen clinical outcomes for schizophrenia patients.

## DISCLOSURE

*This research was funded by National Science Centre, Poland (grant number: 2018/31/B/NZ5/00527).*

*The authors declare no conflicts of interest.*

*Authors' Contribution: All authors have contributed to article writing and data analysis.*

*Data Availability: The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.*

*Informed Consent: All subjects provided informed written consent for participation in the study and agreed for the data to be used as part of a wider investigation regarding schizophrenia.*

*Ethics: The Bioethics Committees at Wroclaw Medical University (Wroclaw, Poland) and Pomeranian Medical University (Szczecin, Poland) provided initial ethics approval for the project. The Bond University Human Research Ethics Committee (Queensland, Australia) subsequently approved the current study to proceed.*

## REFERENCES

- Akbezy ZY, Yildiz M, Gündüz N (2019) Is there any association between childhood traumatic experiences, dissociation, and psychotic symptoms in schizophrenic patients? *Psychiatry Investig*. 16:346–354.
- Alameda L, Christy A, Rodriguez V, Salazar de Pablo G, Thrush M, Shen Y, Alameda B, Spinazzola E, Iacoponi E, Trotta G, Carr E, Ruiz Veguilla M, Aas M, Morgan C, Murray RM (2021) Association between specific childhood adversities and symptom dimensions in people with psychosis: Systematic review and meta-analysis. *Schizophr Bull*. 47:975–985.
- Alameda L, Ferrari C, Baumann PS, Gholam-Rezaee M, Do KQ, Conus P (2015) Childhood sexual and physical abuse: Age at exposure modulates impact on functional outcome in early psychosis patients. *Psychol Med*. 45:2727–2736.
- Alameda L, Golay P, Baumann PS, Ferrari C, Do KQ, Conus P (2016) Age at the time of exposure to trauma modulates the psychopathological profile in patients with early psychosis. *J Clin Psychiatry*. 77:e612–e618.
- Álvarez M, Roura P, Osés A, Foguet Q, Solà J, Arrufat F-X (2011) Prevalence and clinical impact of childhood trauma in patients with severe mental disorders. *J Nerv Ment Dis*. 199:156–161.
- American Psychiatric Association (2013) *Diagnostic and statistical manual of mental disorders* (5th ed). Washington, DC: American Psychiatric Association. <https://doi.org/10.1176/appi.books.9780890425596>.
- An der Heiden W, Leber A, Häfner H (2016) Negative symptoms and their association with depressive symptoms in the long-term course of schizophrenia. *Eur Arch Psychiatry Clin Neurosci*. 266:387–396.
- Bailey T, Alvarez-Jimenez M, Garcia-Sanchez AM, Hulbert C, Barlow E, Bendall S (2018) Childhood trauma is associated with severity of hallucinations and delusions in psychotic disorders: A systematic review and meta-analysis. *Schizophr Bull*. 44:1111–1122.
- Bernstein DP, Fink L, Handelsman L, Foote J (1994) *Childhood trauma questionnaire (CTQ)*. Washington, DC: APA PsycTests <https://doi.org/10.1037/t02080-000>.
- Carbon M, Correll CU (2014) Thinking and acting beyond the positive: The role of the cognitive and negative symptoms in schizophrenia. *CNS Spectr*. 19(S1):35–53.
- Carvalho Fernando S, Beblo T, Schlosser N, Terfehr K, Otte C, Löwe B, Wolf OT, Spitzer C, Driessen M, Wingenfeld K (2014) The impact of self-reported childhood trauma on emotion regulation in borderline personality disorder and major depression. *J Trauma Dissociation*. 15:384–401.

- Chae S, Sim M, Lim M, Na J, Kim D (2015) Multivariate analysis of relationship between childhood trauma and psychotic symptoms in patients with schizophrenia. *Psychiatry Investig*. 12:397–401.
- Cohen JR, Menon SV, Shorey RC, Le VD, Temple JR (2017) The distal consequences of physical and emotional neglect in emerging adults: A person-centered, multi-wave, longitudinal study. *Child Abuse Negl*. 63:151–161.
- Correll CU, Schooler NR (2020) Negative symptoms in schizophrenia: A review and clinical guide for recognition, assessment, and treatment. *Neuropsychiatr Dis Treat*. 16:519–534.
- Dannlowski U, Stuhmann A, Beutelmann V, Zwanzger P, Lenzen T, Grotegerd D, Domschke K, Hohoff C, Ohrmann P, Bauer J, Lindner C, Postert C, Konrad C, Arolt V, Heindel W, Suslow T, Kugel H (2012) Limbic scars: Long-term consequences of childhood maltreatment revealed by functional and structural magnetic resonance imaging. *Biological Psychiatry (1969)*. 71:286–293.
- Devi F, Shahwan S, Teh WL, Sambasivam R, Zhang YJ, Lau YW, Ong SH, Fung D, Gupta B, Chong SA, Subramaniam M (2019) The prevalence of childhood trauma in psychiatric outpatients. *Ann Gen Psychiatry*. 18:15–15.
- Dollfus S, Mach C, Morello R (2016) Self-Evaluation of Negative Symptoms: A novel tool to assess negative symptoms. *Schizophr Bull*. 42:571–578.
- Duhig M, Patterson S, Connell M, Foley S, Capra C, Dark F, Gordon A, Singh S, Hides L, McGrath JJ, Scott J (2015) The prevalence and correlates of childhood trauma in patients with early psychosis. *Aust N Z J Psychiatry*. 49:651–659.
- Faerden A, Lyngstad SH, Simonsen C, Ringen PA, Papsuev O, Dieset I, Andreassen OA, Agartz I, Marder SR, Melle I (2018) Reliability and validity of the self-report version of the apathy evaluation scale in first-episode psychosis: Concordance with the clinical version at baseline and 12 months follow-up. *Psychiatry Res*. 267:140–147.
- Fisher HL, McGuffin P, Murray RM, Morgan C, Boydell J, Fearon P, Craig TK, Dazzan P, Morgan K, Doody GA, Jones PB, Left J (2014) Interplay between childhood physical abuse and familial risk in the onset of psychotic disorders. *Schizophr Bull*. 40:1443–1451.
- Foussias G, Agid O, Fervaha G, Remington G (2013) Negative symptoms of schizophrenia: Clinical features, relevance to real world functioning and specificity versus other CNS disorders. *Eur Neuropsychopharmacol*. 24:693–709.
- Fusar-Poli P, Papanastasiou E, Stahl D, Rocchetti M, Carpenter W, Shergill S, McGuire P (2015) Treatments of negative symptoms in schizophrenia: Meta-analysis of 168 randomized placebo-controlled trials. *Schizophr Bull*. 41:892–899.
- Galderisi S, Mucci A, Buchanan RW, Arango C (2018) Negative symptoms of schizophrenia: New developments and unanswered research questions. *Lancet Psychiatry*. 5:664–677.
- Gallagher BJ, Jones BJ (2013) Childhood stressors and symptoms of schizophrenia. *Clin Schizophr Relat Psychoses*. 7:124–130.
- Gallagher BJ, Jones BJ (2016) Neglect and hereditary risk: Their relative contribution to schizophrenia with negative symptomatology. *Int J Soc Psychiatry*. 62:235–242.
- Garcia-Portilla MP, Garcia-Alvarez L, Saiz PA, Al-Halabi S, Bobes-Bascaran MT, Bascaran MT, Muñiz J, Bobes J (2015) Psychometric evaluation of the negative syndrome of schizophrenia. *Eur Arch Psychiatry Clin Neurosci*. 265:559–566.
- Gayer-Anderson C, Reininghaus U, Paetzold I, Hubbard K, Beards S, Mondelli V, Di Forti M, Murray RM, Pariante CM, Dazzan P, Craig TJ, Fisher HL, Morgan C (2020) A comparison between self-report and interviewer-rated retrospective reports of childhood abuse among individuals with first-episode psychosis and population-based controls. *J Psychiatr Res*. 123:145–150.
- Grindey A, Bradshaw T (2022) Do different adverse childhood experiences lead to specific symptoms of psychosis in adulthood? A systematic review of the current literature. *Int J Ment Health Nurs*. 31:868–887.
- Grivel MM, Leong W, Masucci MD, Altschuler RA, Amdt LY, Redman SL, Yang LH, Bruccato G, Girgis RR (2018) Impact of lifetime traumatic experiences on suicidality and likelihood of conversion in a cohort of individuals at clinical high-risk for psychosis. *Schizophr Res*. 195:549–553.
- Hanson JL, Hariri AR, Williamson DE (2015) Blunted ventral striatum development in adolescence reflects emotional neglect and predicts depressive symptoms. *Biological Psychiatry*. 78:598–605.
- Hassan AN, De Luca V (2014) The effect of lifetime adversities on resistance to anti-psychotic treatment in schizophrenia patients. *Schizophr Res*. 161:496–500.
- Inyang B, Gondal FJ, Abah GA, Minnal Dhandapani M, Manne M, Khanna M, Challa S, Kabeil AS, Mohammed L (2022) The role of childhood trauma in psychosis and schizophrenia: A systematic review. *Cureus*. 14:e21466–e21466.
- Isvoranu A, van Borkulo CD, Boyette L-L, Wigman JTW, Vinkers CH, Borsboom D (2017) A network approach to psychosis: Pathways between childhood trauma and psychotic symptoms. *Schizophr Bull*. 43:187–196.
- Katembu S, Zahedi A, Sommer W (2023) Childhood trauma and violent behavior in adolescents are differentially related to cognitive-emotional deficits. *Front Public Health*. 11:1001132.
- Kaufman J, Torbey S (2019) Child maltreatment and psychosis. *Neurobiol Dis*. 131:104378–104378.
- Kay SR, Opler LA, Fiszbein A (2009) *Positive and Negative Syndrome Scale (PANSS): Technical manual*. Toronto: Multi-Health Systems Inc.
- Kay SR, Opler LA, Lindenmayer JP (1988) Reliability and validity of the Positive and Negative Syndrome Scale for schizophrenics. *Psychiatry Res*. 23:99–110.
- Kessler RC, Aguilar-Gaxiola S, Alonso J, Benjet C, Bromet EJ, Cardoso G, Degenhardt L, de Girolamo G, Dinolova RV, Ferry F, Florescu S, Gureje O, Haro JM, Huang Y, Karam EG, Kawakami N, Lee S, Lepine J-P, Levinson D, Navarro-Mateu F, Pennell BE, Piazza M, Posada-Villa J, Scott KM, Stein DJ, Ten Have M, Torres Y, Viana MC, Petukhova MV, Sampson NA, Zaslavsky AM, Koenen KC (2017) Trauma and PTSD in the WHO world mental health surveys. *Eur J Psychotraumatol*. 8(sup5):1353383.
- Kirkpatrick B, Strauss GP, Nguyen L, Fischer BA, Daniel DG, Cienfuegos A, Marder SR (2011) The Brief Negative Symptom Scale: Psychometric properties. *Schizophr Bull*. 37:300–305.
- Kring AM, Gur RE, Blanchard JJ, Horan WP, Reise SP (2013) The Clinical Assessment Interview for Negative Symptoms (CAINS): Final development and validation. *Am J Psychiatry*. 170:165–172.
- Letourneau N, Dewey D, Kaplan BJ, Ntanda H, Novick J, Thomas JC, Deane AJ, Leung B, Pon K, Giesbrecht GF (2019) Intergenerational transmission of adverse childhood experiences via maternal depression and anxiety and moderation by child sex. *J Dev Orig Health Dis*. 10:88–99.
- Leucht C, Leucht S, Huhn M, Chaimani A, Mavridis D, Helfer B, Samara M, Rabaiali M, Bäcker S, Cipriani A, Geddes JR, Salanti G, Davis JM (2017) Sixty years of placebo-controlled antipsychotic drug trials in acute schizophrenia: Systematic review, bayesian meta-analysis, and meta-regression of efficacy predictors. *Am J Psychiatry*. 174:927–942.
- Loewy RL, Corey S, Amirfathi F, Dabit S, Fulford D, Pearson R, Hua JP, Schlosser D, Stuart BK, Mathalon DH, Vinogradov S (2019) Childhood trauma and clinical high risk for psychosis. *Schizophr Res*. 205:10–14.
- Longden E, Sampson M, Read J (2016) Childhood adversity and psychosis: Generalised or specific effects? *Epidemiol Psychiatr Sci*. 25:349–359.
- Lyne J, O'Donoghue B, Roche E, Renwick L, Cannon M, Clarke M (2018) Negative symptoms of psychosis: A life course approach and implications for prevention and treatment. *Early Interv Psychiatry*. 12:561–571.
- Lyne J, Renwick L, Madigan K, O'Donoghue B, Bonar M, Grant T, Kinsella A, Malone K, Turner N, O'Callaghan E, Clarke M (2013) Do psychosis prodrome onset negative symptoms predict first presentation negative symptoms? *Eur Psychiatry*. 29:153–159.
- Lyons-Ruth K, Block D (1996) The disturbed caregiving system: Relations among childhood trauma, maternal caregiving, and infant affect and attachment. *Infant Ment Health J*. 17:257–275.
- Makaruk K, Włodarczyk J, Sethi D, Michalski P, Szredzińska R, Karwowska P (2018) *Survey of adverse childhood experiences and associated health-harming behaviours among Polish students*. Geneva: World Health Organization.
- Marder SR, Galderisi S (2017) The current conceptualization of negative symptoms in schizophrenia. *World Psychiatry*. 16:14–24.
- Marusak HA, Martin KR, Etkin A, Thomason ME (2015) Childhood trauma exposure disrupts the automatic regulation of emotional processing. *Neuropsychopharmacology*. 40:1250–1258.

- Misiak B, Frydecka D (2016) A history of childhood trauma and response to treatment with antipsychotics in first-episode schizophrenia patients: Preliminary results. *J Nerv Ment Dis.* 204:787–792.
- Misiak B, Frydecka D, Kowalski K, Samochowiec J, Jabłoński M, Gawęda Ł (2023a) Associations of neurodevelopmental risk factors with psychosis proneness: Findings from a non-clinical sample of young adults. *Compr Psychiatry.* 123:152385.
- Misiak B, Samochowiec J, Gawęda Ł, Frydecka D (2023b) Association of sociodemographic, proximal, and distal clinical factors with current suicidal ideation: Findings from a nonclinical sample of young adults. *Eur Psychiatry.* 66:e29.
- Misiak B, Szewczuk-Bogusławska M, Samochowiec J, Moustafa AA, Gawęda Ł (2023c) Unraveling the complexity of associations between a history of childhood trauma, psychotic-like experiences, depression and non-suicidal self-injury: A network analysis. *J Affect Disord.* 337:11–17.
- Möller H-J, Czobor P (2015) Pharmacological treatment of negative symptoms in schizophrenia. *Eur Arch Psychiatry Clin Neurosci.* 265:567–578.
- Mørkved N, Endsjø M, Winje D, Johnsen E, Dovran A, Arefjord K, Kroken RA, Helle S, Anda-Ågotnes LG, Rettenbacher MA, Huber N, Løberg EM (2017) Childhood trauma in schizophrenia spectrum disorder as compared to other mental health disorders. *Psychosis.* 9:48–56.
- Nijenhuis ERS, Van der Hart O, Kruger K (2002) The psychometric characteristics of the Traumatic Experiences Checklist (TEC): First findings among psychiatric outpatients. *Clin Psychol Psychother.* 9:200–210.
- Obermeier M, Schennach-Wolff R, Meyer S, Möller H-J, Riedel M, Krause D, Seemüller F (2011) Is the PANSS used correctly? A systematic review. *BMC Psychiatry.* 11:113–113.
- Ohata H, Yotsumoto K, Taira M, Kochi Y, Hashimoto T (2014) Reliability and validity of a brief self-rated scale of health condition with acute schizophrenia: Schizophrenia patients' health condition. *Psychiatry Clin Neurosci.* 68:70–77.
- Onitsuka T, Hirano Y, Nakazawa T, Ichihashi K, Miura K, Inada K, Mitoma R, Yasui-Furukori N, Hashimoto R (2022) Toward recovery in schizophrenia: Current concepts, findings, and future research directions. *Psychiatry Clin Neurosci.* 76, 282–291. <https://doi.org/10.1111/pcn.13342>.
- Peralta V, Cuesta MJ (1994) Psychometric properties of the Positive and Negative Syndrome Scale (PANSS) in schizophrenia. *Psychiatry Res.* 53:31–40.
- Piskulic D, Addington J, Cadenhead KS, Cannon TD, Cornblatt BA, Heinssen R, Perkins DO, Seidman LJ, Tsuang MT, Walker EF, Woods SW, McGlashan TH (2012) Negative symptoms in individuals at clinical high risk of psychosis. *Psychiatry Res.* 196:220–224.
- Popovic D, Schmitt A, Kaurani L, Senner F, Papiol S, Malchow B, Fischer A, Schulze TG, Koutsouleris N, Falkai P (2019) Childhood trauma in schizophrenia: Current findings and research perspectives. *Front Neurosci.* 13:274–274.
- Rabinowitz J, Berardo CG, Bugarski-Kirola D, Marder S (2013a) Association of prominent positive and prominent negative symptoms and functional health, well-being, healthcare-related quality of life and family burden: A CATIE analysis. *Schizophr Res.* 150(2–3):339–342.
- Rabinowitz J, Werbeloff N, Caers I, Mandel FS, Stauffer V, Menard F, Kinon BJ, Kapur S (2013b) Negative symptoms in schizophrenia: The remarkable impact of inclusion definitions in clinical trials and their consequences. *Schizophr Res.* 150:334–338.
- Rajkumar RP (2015) The impact of childhood adversity on the clinical features of schizophrenia. *Schizophr Res Treat.* 2015:532082–532087.
- Reuben A, Moffitt TE, Caspi A, Belsky DW, Harrington H, Schroeder F, Hogan S, Ramrakha S, Poulton R, Danese A (2016) Lest we forget: Comparing retrospective and prospective assessments of adverse childhood experiences in the prediction of adult health. *J Child Psychol Psychiatry.* 57:1103–1112.
- Samochowiec J, Jabłoński M, Plichta P, Piotrowski P, Stańczykiewicz B, Bielawski T, Misiak B (2023) The Self-Evaluation of Negative Symptoms in differentiating deficit schizophrenia: The comparison of sensitivity and specificity with other tools. *Psychopathology.* 56:453–461.
- Schäfer I, Fisher HL (2011) Childhood trauma and psychosis—what is the evidence? *Dialogues Clin Neurosci.* 13:360–365.
- Schalinski I, Fischer Y, Rockstroh B (2015) Impact of childhood adversities on the short-term course of illness in psychotic spectrum disorders. *Psychiatry Res.* 228:633–640.
- Schmitz M, Bertsch K, Löffler A, Steinmann S, Herpertz SC, Bekrater-Bodmann R (2021) Body connection mediates the relationship between traumatic childhood experiences and impaired emotion regulation in borderline personality disorder. *Borderline Personal Disord Emot Dysregul.* 8:17.
- Seidenfaden D, Knorr U, Soendergaard MG, Poulsen HE, Fink-Jensen A, Jorgensen MB, Jorgensen A (2016) The relationship between self-reported childhood adversities, adulthood psychopathology and psychological stress markers in patients with schizophrenia. *Compr Psychiatry.* 72:48–55.
- Spalletta G, Janiri D, Piras F, Sani G (2020) *Childhood trauma in mental disorders: A comprehensive approach.* New York: Springer International Publishing. <https://doi.org/10.1007/978-3-030-49414-8>.
- Spidel A, Lecomte T, Greaves C, Sahlstrom K, Yuille JC (2010) Early psychosis and aggression: Predictors and prevalence of violent behaviour amongst individuals with early onset psychosis. *Int J Law Psychiatry.* 33:171–176.
- Stępnicki P, Kondej M, Kaczor AA (2018) Current concepts and treatments of schizophrenia. *Molecules.* 23:2087.
- Storvestre GB, Jensen A, Bjerke E, Tesli N, Rosaeg C, Friestad C, Andreassen OA, Melle I, Haukvik UK (2020) Childhood trauma in persons with schizophrenia and a history of interpersonal violence. *Front Psych.* 11:383–383.
- Swan S, Keen N, Reynolds N, Onwumere J (2017) Psychological interventions for post-traumatic stress symptoms in psychosis: A systematic review of outcomes. *Front Psychol.* 8:341–341.
- Teicher MH, Gordon JB, Nemeroff CB (2022) Recognizing the importance of childhood maltreatment as a critical factor in psychiatric diagnoses, treatment, research, prevention, and education. *Molecular Psychiatry.* 27:1331–1338.
- Tomassi S, Tosato S, Mondelli V, Faravelli C, Lasalvia A, Fioravanti G, Bonetto C, Fioritti A, Cremonese C, Parrino RL, De Santi K, Meneghelli A, Torresani S, De Girolamo G, Semrov E, Pratelli M, Cristofalo D, Ruggeri M (2017) Influence of childhood trauma on diagnosis and substance use in first-episode psychosis. *Br J Psychiatry.* 211:151–156.
- Trotta A, Murray RM, David AS, Kolliakou A, O'Connor J, Forti MD, Dazzan P, Mondelli V, Morgan C, Fisher HL (2016) Impact of different childhood adversities on 1-year outcomes of psychotic disorder in the genetics and psychosis study. *Schizophr Bull.* 42:464–475.
- Trotta A, Murray RM, Fisher HL (2015) The impact of childhood adversity on the persistence of psychotic symptoms: A systematic review and meta-analysis. *Psychol Med.* 45:2481–2498.
- Turner S, Harvey C, Hayes L, Castle D, Galletly C, Sweeney S, Shah S, Keogh L, Spittal MJ (2020) Childhood adversity and clinical and psychosocial outcomes in psychosis. *Epidemiol Psychiatr Sci.* 29:e78–e78.
- Wang Z, Xue Z, Pu W, Yang B, Li L, Yi W, Wang P, Liu C, Wu G, Liu Z, Rosenheck RA (2013) Comparison of first-episode and chronic patients diagnosed with schizophrenia: Symptoms and childhood trauma. *Early Interv Psychiatry.* 7:23–30.
- Wójciak P, Górnica K, Domowicz K, Jaracz K, Szpalik R, Michalak M, Rybakowski J (2019) Polish version of the Self-Evaluation of Negative Symptoms (SNS). *Psychiatr Pol.* 53:551–559.
- Zarчев M, Ruijter RE, Mulder CL, Kamperman AM (2022) Prevalence of adult sexual abuse in men with mental illness: Bayesian meta-analysis. *BJPsych Open.* 8:e16.