The Open Psychology Journal
DOI: 10.2174/0118743501406346250823065311, 2025, 18, e18743501406346
ISSN: 1874-3501

RESEARCH ARTICLE **OPEN ACCESS**

Psychotic Experiences in Borderline Personality Disorder: The Relationship with Childhood Trauma

Mona Ali Zein[1], Julia Kovalenko[1,*] and Reham Ateya Nasr[1,2]

[1]*Department of Basic and Applied Psychology, The British University in Egypt (BUE), Al Shorouk City, Cairo, Egypt*
[2]*Educational Psychology Department, Ain Shams University, Cairo, Egypt*

Abstract:

Introduction: This study aimed to explore the relationship between psychotic experiences, their severity (distress), and childhood trauma in individuals diagnosed with borderline personality disorder (BPD) within an Egyptian adult population.

Methods: Using a cross-sectional design, the study analyzed psychotic experiences, associated distress, and childhood trauma in a sample of 117 participants, including individuals with BPD and matched controls. Standardized self-report measures were administered to assess psychotic experiences, psychotic symptom severity (distress), and childhood trauma history. Path analysis was conducted to investigate trauma types as predictors of psychotic outcomes and BPD diagnosis.

Results: Participants with BPD reported significantly higher levels of psychotic experiences and distress compared to controls. All subtypes of childhood trauma were more prevalent in the BPD group. Among these, physical neglect and sexual abuse emerged as significant predictors of psychotic symptoms and distress. Path analysis identified physical neglect as the strongest predictor of BPD, showing both direct and indirect effects on psychotic symptomatology.

Discussion: The findings highlight the role of specific trauma types - particularly physical neglect - in the development of BPD and its psychotic features. By integrating Linehan's Biosocial Model with trauma theory, the study emphasizes how early neglect may shape invalidating environments, contributing to BPD symptom expression. Physical neglect appeared to be a key risk factor, potentially contributing to BPD development and subsequent psychotic experiences and distress in Egyptians.

Conclusion: The study expanded existing research on trauma-based models of BPD and its psychotic symptoms, providing culturally relevant insights into the impact of childhood trauma and emphasizing the role of social environments and early relational experiences in non-Western contexts. By integrating Linehan's Biosocial Model with trauma theory, this study's findings highlighted that early physical neglect – often overlooked in BPD models – may strongly contribute to shaping invalidating environments and thus influencing BPD symptom expression.

Keywords: Borderline personality disorder (BPD), Psychotic experiences, Psychotic distress, Childhood trauma, Sexual abuse, Physical neglect.

© 2025 The Author(s). Published by Bentham Open.
This is an open access article distributed under the terms of the Creative Commons Attribution 4.0 International Public License (CC-BY 4.0), a copy of which is available at: https://creativecommons.org/licenses/by/4.0/legalcode. This license permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

*Address correspondence to this author at the Department of Basic and Applied Psychology, The British University in Egypt (BUE), Al Shorouk City, Cairo, Egypt; E-mail: julia.koval@bue.edu.eg

Cite as: Zein M, Kovalenko J, Nasr R. Psychotic Experiences in Borderline Personality Disorder: The Relationship with Childhood Trauma. Open Psychol J, 2025; 18: e18743501406346.
http://dx.doi.org/10.2174/0118743501406346250823065311

Received: April 10, 2025
Revised: June 10, 2025
Accepted: June 25, 2025
Published: August 26, 2025

Send Orders for Reprints to
reprints@benthamscience.net

1. INTRODUCTION

Borderline personality disorder (BPD) is a complex mental disorder characterized by a general pattern of emotional outbursts, poor management of interpersonal relationships, and an unstable self-image with symptoms that may include fear of abandonment, unstable identity, impulsivity, suicidal ideation, emotional dysregulation, transient paranoid thoughts, and dissociative episodes [1, 2]. Individuals diagnosed with BPD are often stigmatized and viewed as hopeless and resistant to therapy [3]. Such stigma often occurs due to a misunderstanding of the nature and development of BPD [4-6].

Studies suggest that both the development of BPD and its associated psychotic experiences are often linked to past traumatic experiences and childhood trauma, in particular [7-9]. Patients diagnosed with BPD often report experiencing psychotic symptoms, including hallucinations, distorted body images, reference thoughts, paranoid symptoms, and hypnogogic symptoms [9]. The most commonly reported symptoms in BPD are auditory hallucinations, which often echo past traumas [10-15].

While past studies have established a general association between childhood trauma and BPD, there is a significant gap in understanding how specific trauma types may shape the presentation and severity of psychotic symptoms in BPD patients. Moreover, most existing research has focused on Western populations, leaving the influence of sociocultural factors and psychotic symptomatology in non-Western settings largely unexplored. Notably, up to the authors' knowledge, no prior research has examined the prevalence and characteristics of psychotic symptoms in Egyptian individuals with BPD, nor their relationship to specific childhood trauma types. Addressing this gap is crucial for refining diagnostic frameworks and developing culturally relevant interventions.

To fill in this research gap, this study investigates the relationship between specific childhood traumatic experiences and the presentation and severity of psychotic symptoms in Egyptian adults with BPD. This study provides new insights into trauma-related mechanisms in BPD, supporting the development of culturally informed diagnostic frameworks and interventions tailored to non-Western populations.

1.1. Borderline Personality Disorder and Psychotic Experiences

Psychotic symptoms in BPD can be quite distressing, yet they are frequently overlooked in clinical settings and sometimes labelled as pseudo-psychotic and quasi-psychotic [16, 17]. Recent studies suggest that psychotic symptoms in BPD exist on a continuum, with distressing experiences ranging from pseudo-psychotic episodes and quasi-psychotic manifestations to true psychosis [11, 13]. In this study, psychotic distress is defined as the emotional suffering associated with psychotic-like experiences, such as auditory hallucinations or delusions [18]. While individuals with BPD may not meet the criteria for a full psychotic disorder, they often experience significant distress related to these symptoms, impacting their overall functioning [19]. In this regard, pseudo-psychotic episodes are those similar to true psychosis, yet lacking the severity, persistence, and/or loss of insight observed in the latter. Additionally, quasi-psychosis refers to transient, psychotic-like episodes reactive to emotional distress, which might not fully align with a psychotic disorder. Such quasi-psychotic experiences in BPD often include paranoid ideation, auditory hallucinations, and dissociative states [11, 20].

While psychotic experiences in BPD can be transient, research suggests that certain symptoms may persist and resemble those observed in psychotic disorders [8, 17, 19, 21]. Thus, the hallucinatory experiences in BPD patients were found to be phenomenologically similar to those described in the schizophrenia spectrum in their vividness, duration, and spatial localization [12]. For instance, a study on 171 BPD patients found that 30% experienced persistent and distressing auditory hallucinations [22]. Another study showed that despite the occurrence of stress-related psychotic episodes in BPD patients, they were significantly more likely to experience persistent and reactive hallucinations compared to control groups [23]. It has been reported that the prevalence of positive psychotic symptoms among BPD patients ranges from 13% to 60%, with auditory hallucinations being the most common manifestation [10-15, 24]. One study showed that 50% of BPD patients experienced auditory hallucinations, 30% had visual hallucinations, 20% had delusions, 13% had tactile hallucinations, and 10% had olfactory hallucinations [25].

Beyond prevalence rates, some research highlighted qualitative differences of psychotic experiences in BPD patients, compared to those in other disorders. For instance, it was demonstrated that individuals diagnosed with BPD experienced more guilt-related delusions compared to patients with schizophrenia [13]. Additionally, BPD auditory hallucinations tended to be more self-critical and derogatory [12, 13]. Yet, it is important to emphasize that psychotic symptoms in BPD are still not fully understood, especially those other than auditory hallucinations [10].

1.2. Borderline Personality Disorder and Childhood Trauma

Childhood trauma refers to experiencing or witnessing events that pose a serious risk of death or injury and cause extreme arousal, exceeding one's capacity to cope, tolerate, or accept it, therefore causing continuing negative consequences on one's mental health and well-being, including persistent flashbacks, psychosocial and interpersonal difficulties, and psychosomatic symptoms [26]. All forms of childhood trauma experiences are highly prevalent among individuals with BPD, with studies estimating that between 30% and 90% of all BPD patients report some sort of childhood physical or emotional abuse [27]. These adverse experiences, occurring before the age of 18, include sexual abuse, physical abuse, as well as emotional abuse and neglect [26, 28]. Overall, research

indicates that BPD is more strongly associated with childhood adverse experiences than any other personality disorder [29]. A study of 358 BPD patients found that 84% had experienced some form of physical, verbal, and emotional childhood abuse and neglect compared to 61% in the control group [30, 31].

Particularly, sexual trauma is frequently reported among BPD patients. For instance, a study conducted on 290 individuals showed that the extent of the experienced childhood sexual abuse contributed to the severity of borderline symptoms [2]. Another study supported these findings by showing that sexual abuse alters self-identity, social status, and self-regulation, contributing to BPD development [32]. However, while sexual abuse acts as a risk factor in the onset of BPD, it is not directly linked to the emotional distress experienced by BPD patients [33, 34].

Studies indicate that adverse childhood experiences contribute to BPD development through shaping attachment styles, with disorganized attachment emerging when a child perceives their caregiver as both a source of comfort and threat due to abuse or neglect [35]. In environments where caregiver responsiveness is inconsistent or absent, children struggle to develop trust, fostering emotional instability and interpersonal difficulties, which are core features of BPD [36, 37]. Finally, Kernberg's object-relations model explains that identity diffusion, impaired reality testing, and emotional dysregulation - distinctive symptoms of BPD - are caused by disruption in the integration of caregiver-based object relations [26, 38]. This model suggests that early relational trauma shapes negative self-perception and distorted interpersonal expectations, reinforcing core BPD pathology [39].

However, some studies suggest that childhood trauma is not the primary factor in BPD development. A systematic review of 19 longitudinal studies did not support the link between childhood maltreatment and BPD diagnosis. The review found that the relationship was stronger in studies relying on a symptom count rather than a categorical diagnosis of BPD [40]. Additionally, a twin study examining the association between childhood trauma and BPD found little to no evidence of a causal relationship between the two variables, instead citing that the associations are a result of shared genetic influences [41]. These findings highlight the need for more research to clarify the link between childhood trauma and BPD.

Some studies emphasizes the role of the hypothalamic-pituitary-adrenal (HPA) axis in mediating structural changes resulting from childhood trauma, which potentially contributes to dissociation and BPD-related psychosis [42]. Persistent activation of the HPA axis prolongs the impact of childhood traumatic experiences by maintaining a heightened state of alertness, leading to hyperactivity of the stress response system [12, 43-46]. HPA axis dysfunction has been linked to overthinking, anxiety, and depression in BPD individuals [47], with early adversities potentially predisposing individuals to dysregulation and to BPD development [44]. Heightened emotional arousal and stress cause misinterpretation of internal thoughts or memories as external stimuli, leading to hallucinations and other psychotic symptoms in individuals with BPD [9, 15, 16, 48-52]. Due to the influence of past trauma, these hallucinations often carry a negative tone, mirroring the previously experienced abuse or neglect [12, 25]. While the HPA-BPD psychosis link remains an emerging theoretical framework, neurobiological research suggests that chronic stress-reactive dysregulation due to early trauma may contribute to stress-induced psychotic symptoms [41].

Trauma during critical periods of development was linked to maladaptive coping mechanisms and emotional regulation skills, with dissociation mediating the relationship between childhood trauma and psychotic symptoms in BPD [16, 53]. Furthermore, the prevalence of psychotic symptoms among individuals with BPD who have experienced trauma highlights the profound and lasting impact of early adverse experiences on mental health [12, 25]. Specifically, auditory hallucinations have been frequently reported as negative and distressing, deeply rooted in the individual's past traumatic experiences. For instance, individuals with BPD who experienced verbal abuse during childhood may 'hear' accusatory or threatening voices, echoing language used by their abusers [53, 54]. These distressing hallucinations may reinforce the individual's feelings of worthlessness, heightened anxiety, mistrust, paranoia, and fear [16]. Studies showed that these hallucinations were not arbitrary; instead, they often reflected the emotional and psychological scars left by childhood trauma [9, 55].

The strong connection between childhood trauma and psychotic symptoms in BPD highlights the complex interplay between early life experiences, biological vulnerability, and psychological manifestations. This interaction aligns with emerging trauma theory, which emphasizes how early adversity disrupts neurodevelopment and stress regulation, increasing susceptibility to emotional dysregulation and psychotic distress [46]. Additionally, this supports Linehan's Biosocial Model of BPD development, suggesting that neurobiological vulnerabilities interact with psychosocial risk factors, such as childhood trauma and invalidation, to shape BPD symptom expression [56]. The integration of trauma theory and the biosocial model provides a comprehensive framework for understanding how early adversity contributes to both emotional dysregulation and psychotic distress in BPD in our study.

Within Linehan's Biosocial Theory, BPD is a disorder of emotion dysregulation, shaped by both biological predispositions and environmental influences [56]. Individuals with BPD have an innate emotional vulnerability, characterized by intense emotional reactions and difficulty returning to baseline after distressing events [56, 57]. When this biological predisposition interacts with an invalidating environment, such as childhood trauma, maladaptive emotional and cognitive patterns are reinforced, contributing to BPD development [56, 58]. If an individual's emotional responses are dismissed, punished, or ignored due to neglect, emotional abuse, and physical maltreatment, an invalidating environment is formed,

leading to chronic emotional instability and identity disturbances [56, 58].

Research has also found that neglect and emotional abuse are among the strongest predictors of psychotic experiences in BPD, reinforcing the biosocial model's emphasis on environmental invalidation as a key factor in symptom development [58]. This transactional model also explains why individuals with BPD often experience a continuum of psychotic symptoms, since they may emerge as maladaptive coping mechanisms in response to early invalidation and trauma [56].

1.3. Differential Impact of Childhood Trauma on BPD and Psychotic Symptoms

Emerging research has examined the relationship between specific types of childhood trauma, including physical and emotional abuse, sexual abuse, emotional neglect, and physical neglect, and BPD [30, 59-64]. Despite wide recognition of childhood trauma as a major risk factor for the development of BPD, the differential impact of trauma types remains unclear.

Some studies reported a higher association between BPD and emotional neglect and emotional abuse [65]. In particular, emotional neglect – through deprivation of validation and emotional support – was shown to enable chronic feelings of emptiness and interpersonal hypersensitivity in individuals with BPD, further reinforcing the disorder's core symptoms [35]. One study found that emotional abuse was the only significant predictor of BPD and only in men [66].

Other research suggested a strong relationship between sexual and physical abuse and severe emotional neglect [7]. Furthermore, physical and sexual abuse were most frequently linked to psychotic experiences and overall clinical presentation of BPD, particularly in women [52, 67, 68]. Sexual assault was specifically linked to hallucinations [69, 70]. However, it is important to note that many studies have a priori explored the link between sexual and physical abuse and BPD, excluding other trauma types from the analysis, which might have influenced the findings. More recent meta-analyses of childhood adversity and BPD reported more negative associations between sexual abuse and BPD [29]. Conversely, physical neglect was found as the most common form of childhood trauma among BPD participants (48.9%) [29]. Among other strong predictors of psychotic experiences in BPD were emotional abuse associated with schizotypal symptoms [7].

Understanding the differential impact of childhood trauma types on BPD and psychotic symptoms is essential for developing targeted interventions. However, the limited number of studies conducted in non-Western contexts, as well as the lack of consensus regarding differential effects of childhood adversity due to the frequent co-occurrence of childhood trauma types in BPD individuals, makes it challenging to isolate specific effects of each type on BPD development and symptomology. Thus, further research is needed, particularly in cross-cultural settings, to examine how childhood trauma may uniquely shape BPD presentation in diverse populations.

Based on prior research and the conceptual framework outlined above, our study will test the following hypotheses: (H1) different types of childhood trauma will be reported more frequently among BPD individuals compared to the control group, and (H2) different types of childhood trauma will have distinct effects on psychotic experiences and psychotic distress in individuals with BPD.

2. METHODOLOGY

2.1. Design

This quantitative research utilized a descriptive cross-sectional correlational design to identify the degree of relationship between borderline personality disorder, the presence and severity of psychotic experiences, and childhood trauma among adult Egyptians. The quantitative study's aim was to shed light on the relationships between these variables, with a special focus on the impact of kinds of childhood trauma on the presentation and severity of psychotic symptoms in BPD Egyptian adults.

2.2. Participants

The study employed both purposeful, convenience, and snowball sampling methods to recruit participants. The questionnaires were disseminated online, targeting both the general public and individuals diagnosed with borderline personality disorder (BPD) who were readily available. By using these sampling techniques, the study aimed to gather a diverse and representative sample of Egyptian adults to explore the relationships between the variables under investigation.

The target participants of the study were Egyptian adults aged 18 to 40, both diagnosed with BPD and self-identifying as having no mental health impairment. Individuals diagnosed with any form of cognitive impairment or condition that would affect cognitive function were excluded from this study to ensure the reliability and validity of the results. All participants included were required to have typical cognitive function, as self-reported. Participants were recruited from diverse backgrounds to ensure diversity in experiences and relevance to the age range of BPD.

2.3. Assessment Tools

First, the shortened version of the Borderline Symptom List (BSL-23), a 23-item patient self-reported scale, was used to screen for the borderline personality disorder symptomatology. It was derived from the longer BSL-95, which aims at assessing the severity classification of DSM-5 aligned symptoms of BPD in individuals aged from 18 y.o [71]. The BPD-23 scale items assess the following symptoms and cover the following diagnostic criteria: affective instability about an individual`s character or could encompass features of 'anger', 'depression' or 'anxiety' (*i.e.*, as the 14th item highlights: '*My mood rapidly cycled in terms of anxiety, anger, and depression*'), recurrent suicidal behavior, threats, gestures or self-mutilating behaviors (*i.e.*, '*I didn't believe in my right to live*', '*The idea of death had a certain fascination for me*',

'*I thought of hurting myself*', '*I wanted to punish myself*'), transient dissociative phenomena (*i.e.*, '*I felt as if I was far away from myself*'), 'self-criticizing' behavior (*i.e.*, '*Criticism had a devastating effect on me*'), trust related issues (*i.e.*, '*I didn't trust other people*'), involuntary emotional aspects of vulnerability and 'shame', a 'self-hate' feeling, a feeling of being 'alone' sensation, and 'helplessness' feeling of being ignored' [71].

The 21-item Prodromal Questionnaire, Brief Version (PQ-B) was used for psychosis risk screening. It is a 21-item shortened version of the 92-item Prodromal Questionnaire [18]. The 21-item PQB is a self-report questionnaire, consisting of positive symptoms questions and additional questions related to the severity of these symptoms, or distress caused by these symptoms and their functional effects. The PQ-B measures two key constructs related to psychosis, including psychotic experiences and psychotic distress. Psychotic experiences (PE) refer to hallucinations, delusions, or perceptual distortions that signal prodromal (early) psychosis, which ranges from mild and transient to persistent and distressing. Meanwhile, psychotic distress is defined as the emotional suffering caused by such psychotic symptoms. The distress can manifest as anxiety, fear, confusion, or impairment in daily functioning.

The PQ-B includes *yes/no* questions about psychotic-like experiences, followed by distress ratings for each endorsed symptom. Example PE items include, '*Do you ever hear things that other people do not hear?*' or '*Do you ever feel that your thoughts are being controlled by outside forces?*'. Symptom endorsement is coded as No = 0, Yes = 1, with endorsed symptoms assessed using a Likert scale for distress (1 = 'strongly disagree', 2 = 'disagree', 3 = 'neutral', 4 = 'agree', and 5 = 'strongly agree'). A Distress Score ≥ 6 is often used as a cutoff for identifying individuals at higher risk for psychosis [18]. The maximum possible psychotic experiences score is 21, while the maximum possible score of psychotic distress is 105. All the versions of the PQ appeared to be accurate in identifying individuals with ultra-high risk syndrome for psychosis with different thresholds [72].

The 28-item *Childhood Trauma Questionnaire–Short Form (CTQ),* adapted from the original 70-item questionnaire, was used to assess adverse childhood experiences of the participants. This self-report questionnaire encompasses different kinds of abuse and trauma, including emotional abuse, physical abuse, sexual abuse, physical neglect, and emotional neglect that occurred during childhood and adolescence, up to the age of 18. This structured retrospective self-report tool has been proven reliable and valid for assessing a broad range of traumatic experiences in childhood. The five scales included the following. Emotional Abuse (EA) refers to verbal assaults, criticism, or demeaning behavior that affects a child's sense of self-worth (*i.e.*, '*People in my family called me things like 'stupid,' 'lazy,' or 'ugly.*'). Physical Abuse (PA) involves bodily harm or injury inflicted through hitting, slapping, or other forms of physical aggression (*i.e.*, '*I got hit so hard by someone in my family that I had to see a doctor or go to the hospital.*'). Sexual Abuse (SA) refers to an inappropriate sexual contact/conduct towards a child (*i.e.*, '*Someone tried to touch me in a sexual way, or tried to make me touch them.*'). Emotional Neglect (EN) refers to the failure to meet a child's emotional needs for love and support (*i.e.*, a reversed scored statement: '*There was someone in my family who helped me feel that I was important or special.*'). Physical Neglect (PN) describes the lack of provision for basic physical needs such as food, shelter, and medical care (*i.e.*, '*My family and I did not have enough to eat.*') [73, 74].

2.4. Procedure

Ethical approval for this study was obtained from the Faculty of Arts and Humanities (FOAH) Ethics Committee, British University in Egypt (BUE), prior to data collection. The study data were gathered through an online, self-administered survey conducted *via* Google Forms, which consisted of three sections. First, participants' informed consent was obtained by directing them to a consent form link, where they were asked to confirm that they had read, understood, and agreed to participate in the study with Yes/No questions. Second, information regarding participants' demographics and backgrounds was collected, including age, self-identified gender, and level of education. Additionally, medical data were gathered, including whether participants had been diagnosed by a psychiatrist or psychologist with borderline personality disorder, the presence of comorbid mental disorders, medications, and drug use.

All participants provided informed consent prior to data collection, in line with institutional and established ethical standards. As no personal or identifiable information was collected or published, specific consent for publication was not required. Data were anonymized and presented in aggregate, ensuring participant confidentiality.

2.5. Data Analysis

To examine the relationships and mediating effects among the study variables, the data obtained were analyzed using several statistical software packages, including IBM SPSS Statistics 23, Jamovi, and JASP. The analytical methods in this study were comprehensive and included t-tests, Generalized Linear Model (GLM) mediation analysis, automatic linear modeling, Bayesian linear regression analysis, and AMOS path modeling. Additionally, the study instruments' reliability was checked with internal consistency analyses. By using these diverse analytical techniques, the study aimed to provide a robust understanding of the complex interactions and mediating effects present among the variables.

Table 1. Study participants.

-	Control Group				BPD Group			
	N	%	SE	SD	N	%	SE	SD
Gender	-	-	0.049	0.398	-	-	0.063	0.443
Males	13	19.4	-	-	13	26	-	-
Females	54	80.6	-	-	37	74	-	-
-	Control Group				BPD Group			
	N	Mean	Median	SD	N	Mean	Median	SD
Age	67	23.0	21.0	5.66	50	24.9	23.0	6.44

Table 2. Comparison of study variables between BPD and control groups.

Variables	t	df	*p*-value	VS-MPR*	Mean Difference	SE Difference	Hedges' g
BPD	-4.925	105.668	< 0.001	9275.042	-19.343	3.927	-0.917
Psychotic experiences	-5.384	110.144	< 0.001	60235.790	-4.659	0.865	-0.996
Psychotic distress	-6.517	103.390	< 0.001	$6.992\times10^{+6}$	-24.292	3.728	-1.217
Emotional abuse	-5.797	112.179	< 0.001	351984.018	-5.116	0.882	-1.068
Physical abuse	-5.022	93.632	< 0.001	11677.966	-5.156	1.027	-0.948
Sexual abuse	-3.759	82.197	< 0.001	143.486	-4.201	1.118	-0.717
Emotional neglect	-5.912	112.733	< 0.001	583674.192	-5.050	0.854	-1.088
Physical neglect	-3.778	103.685	< 0.001	169.057	-2.210	0.585	-0.705

Note: * Vovk-Sellke Maximum *p* -Ratio: Based on a two-sided *p*-value, the maximum possible odds in favor of H_1 over H_0 equals 1/(-e *p* log(*p*)) for $p \leq 0.37$ (Sellke, Bayarri, & Berger, 2001). Welch's t-test.

3. RESULTS

3.1. Descriptive Statistics

Our study sample consisted of 117 adult Egyptians (N=117), aged 18 to 40 (M = 23.8, SD = 6.05). The sample included 91 self-identified females (77,8%), and 26 self-identified males (22.2%). The sample groups' description is presented in Table **1**.

3.2. Scales Reliability Analysis

The reliability of the Borderline Personality Disorder (BPD) scale (23 items) for our study sample was assessed using Cronbach's Alpha, yielding a high reliability coefficient of α=0.950 and a mean item-total correlation of α=0.618. The reliability of the PQ (psychotic experiences) scale was assessed using Cronbach's Alpha, showing a high reliability coefficient of α=0.870 and moderate inter-item consistency of α=487 across 21 items. Finally, the reliability of the Childhood Trauma Scale was assessed using Cronbach's Alpha, yielding α=0.868 across 28 items, indicating its high reliability. The mean inter-item correlation for the scale was α=0.487, reflecting a moderate level of internal consistency.

3.3. Independent Samples t-test

Independent samples t-tests were conducted to compare seven study variables, including BPD screening score, psychotic experiences, psychotic distress, emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect, between the control and BPD-diagnosed groups. Welch's test was used to determine statistically significant differences between the two groups (Table **2**).

Thus, for the borderline personality disorder screening, the Welch's t-test showed a significant difference between groups, t(105.668)=−4.925t(105.668) = -4.925, $p < 0.001$, with a mean difference of -19.343 (SE = 3.927), 95% CI [-27.12, -11.56], and a large effect size (Hedges' g = -0.917), indicating that indeed there was a statistically significant difference between the control and study groups. For the psychotic experience, the Welch's t-test was significant, t(110.144)=−5.384t(110.144) = -5.384, $p < 0.001$, with a mean difference of -4.659 (SE = 0.865), 95% CI [-6.37, -2.94], and a large effect size of -0.996. This implied that the BPD group participants experienced significantly more psychotic symptoms than those in the control group. The severity of psychotic symptoms was also significantly higher in the BPD group compared to the control group: t(103.390)=-6.517t (103.390) = -6.517, $p < 0.001$, with a mean difference of -4.292 (SE = 3.728), 95% CI [-31.68, -16.90], and a very large effect size of Hedges' g = -1.217. Similar significant differences were also observed between the two groups in their adverse childhood events experiences. Thus, for physical neglect, the Welch's t-test indicated a significant difference, t(103.685)= -3.778t(103.685) = -3.778, $p < 0.001$, with a mean difference of -2.210 (SE = 0.585), 95% CI [-3.37, -1.05], and a medium effect size of -0.705; for emotional neglect, t(112.733)= -5.912t(112.733)

= -5.912, $p < 0.001$, with a mean difference of -5.050 (SE = 0.854), 95% CI [-6.78, -3.32], and a large effect size of Hedges' g -1.088. For sexual abuse, the Welch's t-test showed a significant difference, t(82.197)=−3.759t(82.197) = -3.759, $p < 0.001$, with a mean difference of -4.201 (SE = 1.118), 95% CI [-6.42, -1.98], and a medium effect size of Hedges' g = -0.717; for physical abuse, t(93.632) = −5.022t(93.632) = -5.022, $p < 0.001$, with a mean difference of -5.156 (SE = 1.027), 95% CI [-7.19, -3.12], and a large effect size of Hedges' g =-0.948. For emotional abuse, the Welch's t-test revealed a significant difference, t(112.179)=-5.797t (112.179) = -5.797, $p < 0.001$, with a mean difference of -5.116 (SE = 0.882), 95% CI [-6.90, -3.33], and a large effect size of Hedges' g =-1.068 (Fig. **1**).

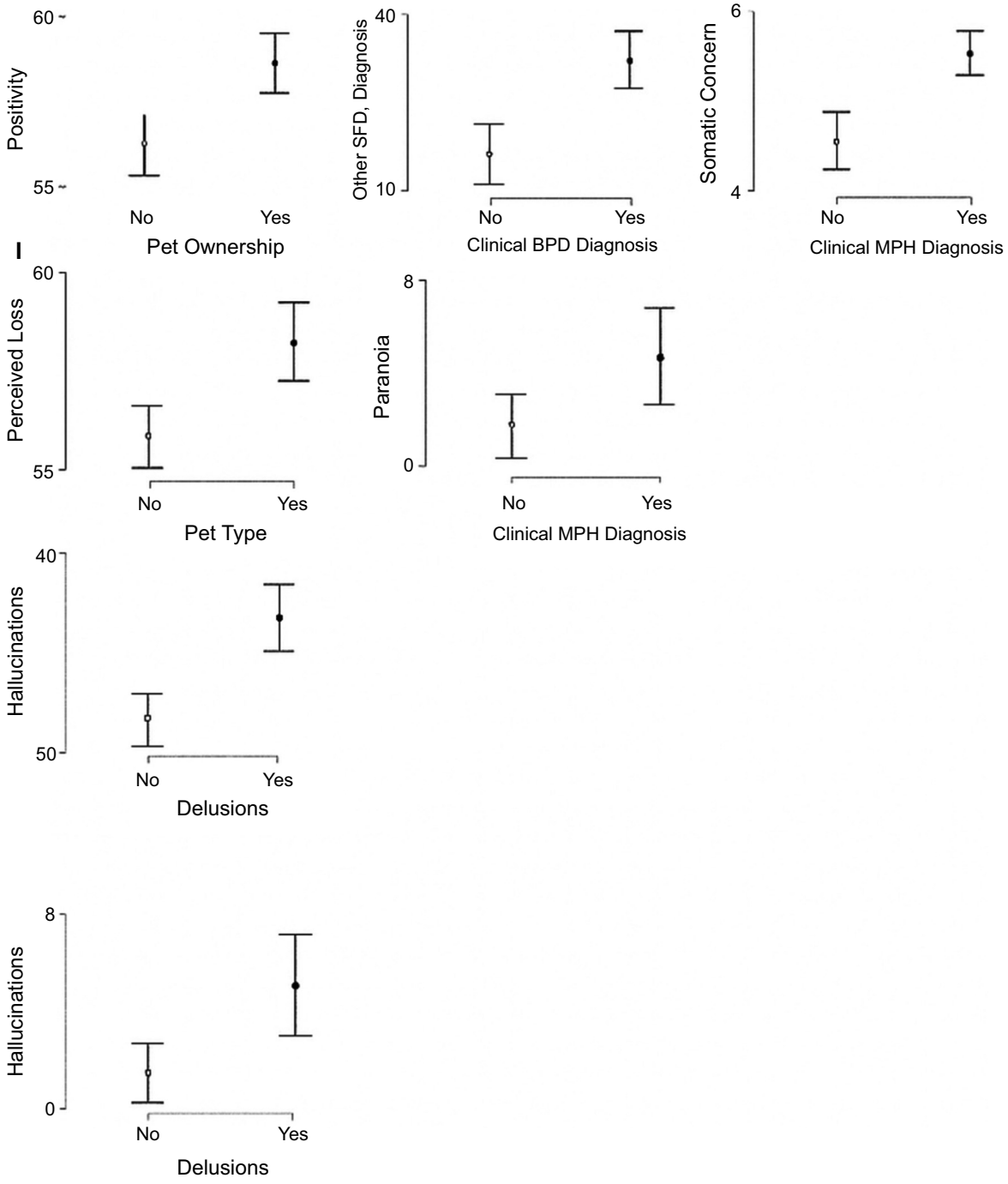


Fig. (1). Descriptives plots.

Table 3. Adverse childhood events in the control group.

-	N	Mean	Std. Error	Std. Deviation
Emotional neglect	66	12,5303	0,61459	4,99298
Emotional abuse	66	12,4242	0,62841	5,10523
Physical abuse	66	9,4242	0,59800	4,85818
Sexual abuse	66	8,3788	0,57239	4,65011
Physical neglect	66	7,9697	0,37644	3,05825

Table 4. Adverse childhood events in the BPD group.

-	N	Mean	Std. Error	Std. Deviation
Emotional neglect	50	17,5800	0,59322	4,19470
Emotional abuse	50	17,5400	0,61955	4,38090
Physical abuse	50	14,5800	0,83451	5,90085
Sexual abuse	50	12,5800	0,96006	6,78862
Physical neglect	50	10,1800	0,44784	3,16673

Levene's test for homogeneity of variances showed that most variables met the assumption of equal variances, except for Sexual Abuse, which violated this assumption ($F(1,114)=14.6492F\ 1,\ 114)\ =\ 14.6492,\ p\ <\ 0.001$).

Regarding the most prevalent adverse childhood experiences in the control group and BPD study group in our sample, individuals in the BPD group reported higher mean scores for all types of adverse childhood events compared to those in the control group. In both groups, the most prevalent kinds of adverse childhood events were emotional neglect and emotional abuse (Tables **3** and **4**).

3.4. Automatic Linear Modelling

Next, the automatic linear modelling was run to investigate the relationship between both psychotic experiences and psychotic distress and all the other independent variables in the study, given that the LINEAR analysis gives rather robust results [75]. First, the standard model was built, eliciting four most important predictors of psychotic experiences and psychotic distress: BPD, physical neglect, age, and sexual abuse (Figs. **2** and **3**).

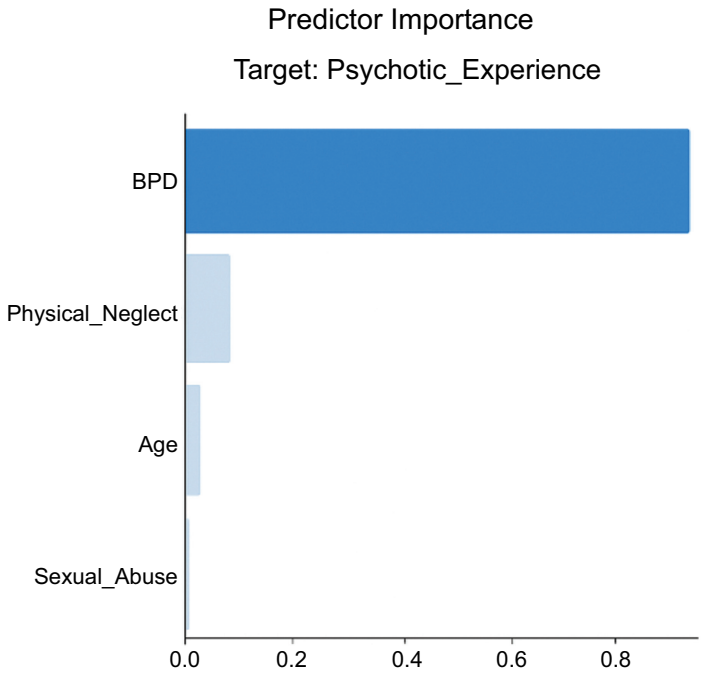


Fig. (2). Model predictors for psychotic experiences.

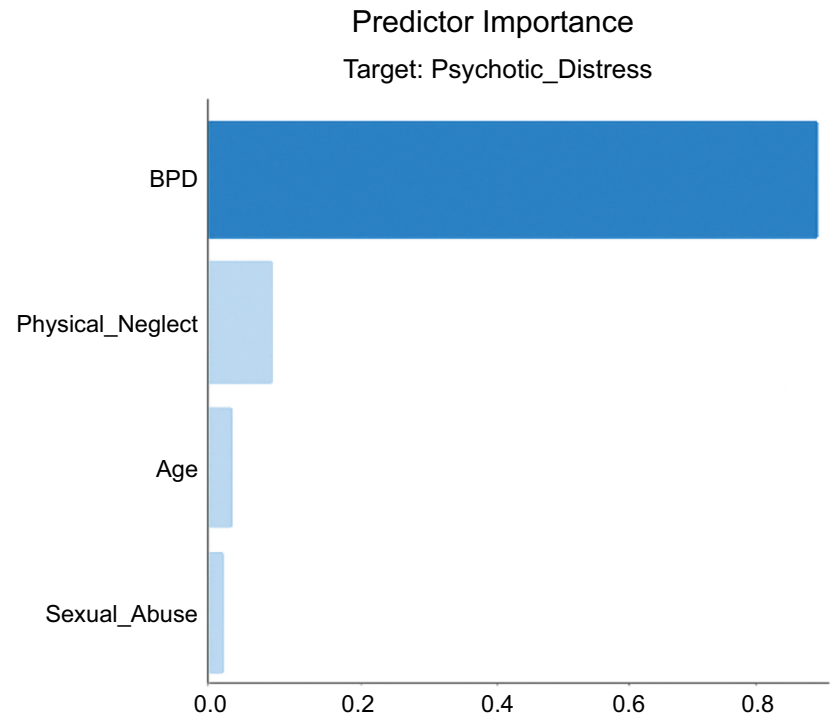


Fig. (3). Model predictors for psychotic distress.

The model-building method was forward stepwise using the information criterion.

3.5. Bayesian Linear Regression Analysis

A Bayesian linear regression analysis was then conducted to examine the relationship between the determined variables of age, physical neglect, sexual abuse, and borderline personality disorder (BPD) and (1) psychotic experiences and (2) psychotics distress. Model comparison using Bayes Factors (BF) indicated that the model including physical neglect, sexual abuse, age, and BPD as predictors provided the best fit to the data (BF_M = 10.728) to predict psychotic experiences. It also had the highest posterior probability (P(M|data) = 0.728, R^2 = 0.581). Similar results were yielded for the dependent variable of psychotic distress. Thus, model comparison using Bayes Factors (BF) indicated that the model including physical neglect, sexual abuse, age, and BPD as predictors provided the best fit to the data (BF_M(10) = 6.893) to predict psychotic distress. It also had the highest posterior probability (P(M|data) = 0.633, R^2 = 0.623). The analysis of individual predictive relationships between the above independent variables and both psychotic experiences and psychotic distress had a similar pattern. In particular, for both dependent variables, physical neglect had a high inclusion probability (P(incl|data) = 0.969 for psychotic experiences and P(incl|data) = 0.981 for psychotic distress). A positive mean coefficient (M = 0.271 and credible interval 0.000-0.465) indicated that higher levels of perception of childhood physical neglect were associated with an increase in psychotic experiences. Similarly, a positive mean coefficient (1.263 and credible interval 0.323–2.225) indicates a strong association of childhood physical neglect with an increase in psychotic distress. Sexual abuse showed a moderate inclusion probability (P(incl|data) = 0.809) and a positive mean coefficient (M = 0.074), indicating its potential positive relationship with psychotic experiences. However, the credible interval between -0.022 and 0.203 included zero, which suggested some uncertainty. Similarly, for psychotic distress, sexual abuse had a moderate inclusion probability (P(incl|data) = 0.768) and a moderate mean coefficient M=0.281, indicating a positive association with the former. However, the credible interval between -0.058 and 0.834 included zero, which suggested again some uncertainty. Age had a moderate inclusion probability for both psychotic experiences (P(incl|data) = 0.892) with a negative mean coefficient M = -0.092 and for psychotic distress (P(incl|data) = 0.779) with a negative coefficient M = -0.258), implying that younger individuals had more intense psychotic experiences and distress. For both psychotic experiences and psychotic distress, inclusion of age in the model yielded some uncertainty due to the presence of zero in the credible intervals (-0.197 – 0.000 and -0.722 – 0.049 respectively). Finally, BPD had the highest inclusion probability for psychotic experiences (P(incl|data) = 1.000; M = 0.142; the credible interval of 0.108 – 0.170) and psychotic distress (P(incl|data) = 1.000; M = 672; the credible interval of 0.547 – 0.806), indicating a strong and consistent influence of the former on psychotic experiences and psychotic distress (Tables **5** and **6**).

Table 5. Model posterior summaries for psychotic experiences.

Coefficient	P(incl)	P(excl)	P(incl|data)	P(excl|data)	$BF_{inclusion}$
Intercept	1.000	1.000	1.000	0.000	1.000
Physical neglect	0.500	0.969	0.969	0.031	31.126
Sexual abuse	0.500	0.809	0.809	0.191	4.227
Age	0.500	0.892	0.892	0.108	8.221
BPD	0.500	1.000	1.000	9.437×10^{-15}	$1.057\times10^{+14}$

Table 6. Model posterior summaries for psychotic distress.

Coefficient	P(incl)	P(excl)	P(incl|data)	P(excl|data)	$BF_{inclusion}$
Intercept	1.000	0.000	1.000	0.000	1.000
Physical neglect	0.500	0.500	0.981	0.019	50.544
Sexual abuse	0.500	0.500	0.768	0.232	3.313
Age	0.500	0.500	0.779	0.221	3.535
BPD	0.500	0.500	1.000	0.000	$4.573\times10^{+16}$

Overall, both models suggested that physical neglect, sexual abuse, age, and BPD were important predictors of both psychotic experiences and psychotic distress, with BPD being the most crucial factor for both dependent variables.

3.6. AMOS Path Modelling and Mediation Analysis

The best-fitting models identified using Bayesian regression analysis were then verified with Amos path analysis. However, inclusion of only BPD and physical neglect as predictors of both psychotic experiences and psychotic distress yielded the best model fit.

Thus, the AMOS model fit predicting psychotic experiences had an excellent fit to the data. The chi-square value for the default model was 0.000 with zero degrees of freedom, resulting in a CMIN/DF ratio of 0.000. Baseline comparisons further supported the model's fit, with NFI, RFI, IFI, TLI, and CFI equaling 1.000. Parsimony-adjusted measures (PRATIO, PNFI, PCFI) for the default model were also 0.000.

Path analysis results showed that physical neglect significantly predicted BPD (Estimate = 2.131, SE = 0.619, C.R. = 3.442, $p < 0.001$), and in its turn, BPD significantly predicted psychotic experiences (Estimate = 0.153, SE = 0.015, C.R. = 10.405, $p < 0.001$). Physical neglect also had a direct significant effect on psychotic experiences (Estimate = 0.284, SE = 0.103, C.R. = 2.760, $p = 0.006$).

The means for physical neglect were significant (Estimate = 8.897, SE = 0.303, C.R. = 29.357, $p < 0.001$). The intercepts for BPD (Estimate = 26.388, SE = 5.869, C.R. = 4.496, $p < 0.001$) and psychotic experiences (Estimate = 2.074, SE = 1.005, C.R. = 2.063, $p = 0.039$) were also significant. The variances for physical neglect (Estimate = 10.656, SE = 1.399, C.R. = 7.616, $p < 0.001$), error term 1 (e1: Estimate = 474.080, SE = 62.248, C.R. = 7.616, $p < 0.001$), and error term 2 (e2: Estimate = 11.843, SE = 1.555, C.R. = 7.616, $p < 0.001$) were significant (Fig. **4**).

Overall, the model fit indices, regression weights, means, intercepts, and variances suggested that the proposed model fit the data well, providing strong support for the hypothesized relationships.

We verified the mediation effect of BPD in the relationship between physical neglect and psychotic experience using the GLM generalized mediation model. The mediation analysis confirmed a significant indirect effect of physical neglect on psychotic experiences through BPD, with an indirect effect estimate of β = 0.205, SE = 0.0992, 95% CI [0.1311, 0.520], z = 3.28, p=0.001. The direct effect of physical neglect on the psychotic experiences was also significant (β = 0.179, SE=0.1023, 95% CI [0.0830, 0.484], z=2.77, p=0.006). The total effect of physical neglect on the psychotic experiences was significant (β=0.384 = 0.384, SE=0.1361, 95% CI [0.3422, 0.876], z = 4.47, p<0.001). For the component pathways, the effect of physical neglect on BPD was significant (β=0.304, SE=0.6166, 95% CI [0.9227, 3.340], z=3.46, p<0.001), as well as the effect of BPD on the psychotic experiences was also significant (β=0.674, SE=0.0146, 95% CI [0.1241, 0.181], z=10.45, p<0.001).

The confidence intervals for these effects were computed using the standard (Delta method).

In contrast, the AMOS path model for the dependent variable of psychotic distress was only marginally fit for our study data. The model fit was evaluated using several indices: for the default model, the chi-square value ($\chi^{2(2)}$=21.736, p=0.000) with a chi-square to degrees of freedom ratio (χ^2/df) of 10.868, showed a poor fit.

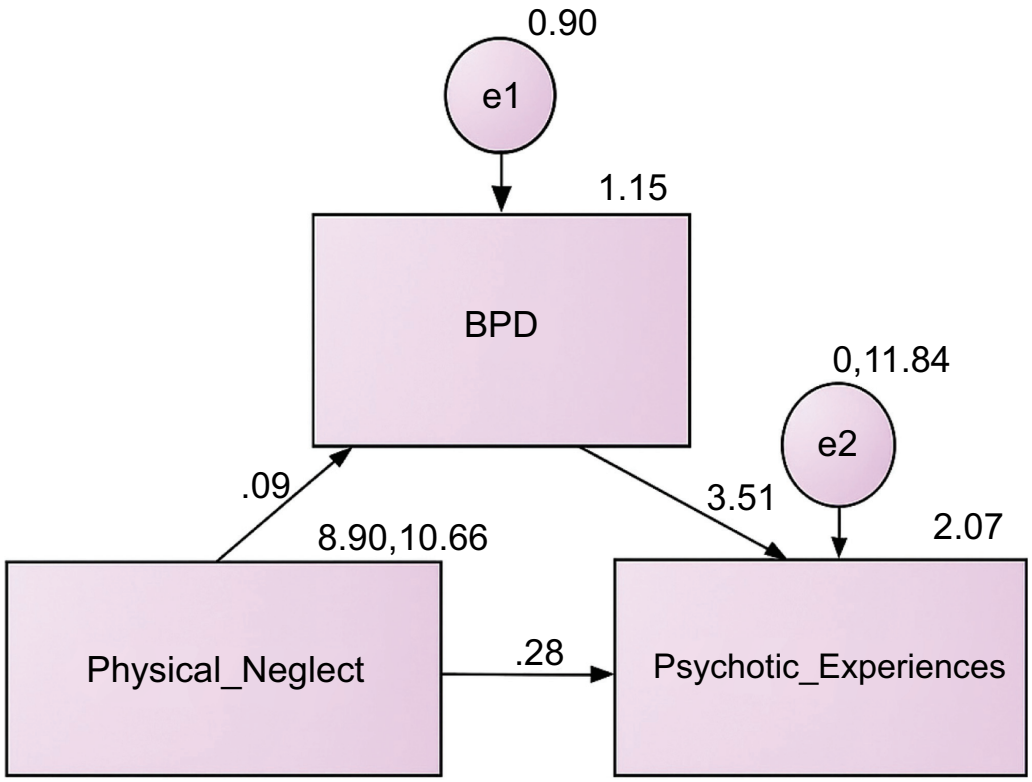


Fig. (4). Path model for psychotic experiences.

The independence model's chi-square $\chi^{2(10)}$=146.150, p<0.001), with a χ^2/df = 14.615, showed a very poor fit. Baseline comparisons yielded a NFI = 0.851, RFI = 0.256, IFI = 0.863, TLI = 0.275, and CFI = 0.855, which suggested that although the default model fit better than the independence model, the fit was poor. Parsimony-adjusted measures, including PRATIO = 0.200, PNFI = 0.170, and PCFI = 0.171, showed that the model did not balance parsimony, thus fitting poorly. Thus, due to the poor model fit, only the model for psychotic experiences was retained. The differences in the model fits obtained for psychotic experiences and psychotic distress may be explained by a more objective measure of psychotic experiences. Since they have more distinct and measurable symptoms, this leads to a better fit in the AMOS path model. In contrast, psychotic distress is more subjective, often involving emotional and psychological responses to these experiences, which could be influenced by a variety of factors. Besides, psychotic distress may not always correlate directly with the frequency of psychotic experiences, also leading to a poorer fit in the model. However, further mediation analysis was conducted to examine if there were similar indirect effects of physical neglect on psychotic distress through BPD as in the case of the dependent variable of psychotic experiences. The indirect effect of physical neglect on psychotic distress through BPD was found significant, β=0.214, z=3.31, p<0.001, with an estimate of 1.508 (SE = 0.4555), 95% CI [0.616, 2.401]. The direct effect of physical neglect on psychotic distress was also significant, β=0.189, z=3.12, p=0.002, with an estimate of 1.336 (SE = 0.4285), 95% CI [0.496, 2.176]. The total effect of physical neglect on psychotic experience distress was significant, β=0.403, z=4.74, p<0.001, with an estimate of 2.844 (SE = 0.6001), 95% CI [1.668, 4.020]. Component pathways indicated that physical neglect significantly predicted BPD, β=0.304, z=3.46, p<0.001, with an estimate of 2.131 (SE = 0.6166), 95% CI [0.923, 3.340]. BPD significantly predicted psychotic distress, β=0.702, z=11.57, p<0.001, with an estimate of 0.708 (SE = 0.0612), 95% CI [0.588, 0.828]. The confidence intervals were computed using the standard (Delta) method. Hence, the GLM mediation results also suggested that BPD partially mediated the relationship between physical neglect and psychotic distress.

4. DISCUSSION

The purpose of this study was to investigate the relationship between psychotic experiences and childhood trauma among individuals with BPD. Our findings provide compelling evidence to support strong associations between these variables. The findings revealed a significant difference in BPD screening scores between controls and the BPD group, with the latter showing significantly higher scores. which confirmed the validity of our sample selection and group categorization in our study.

In our study, participants clinically diagnosed with BPD reported significantly more psychotic experiences and higher perceived severity of psychotic distress, implying a link between BPD and psychotic symptoms. Findings revealed that emotional neglect and emotional abuse are the most reported forms of childhood trauma among Egyptian adults, in both control and BPD-diagnosed groups. However, further analysis showed that individuals in the BPD group reported higher mean scores for all types of childhood trauma compared to those in the control group. The very large and marginally large effect sizes obtained in the study suggest not only the statistical significance of the results but also their practical significance, implying that the presence of BPD in individuals might be strongly associated with psychotic symptoms and childhood trauma. This finding aligns with the trauma theory and previous research that has consistently demonstrated a strong association between childhood trauma and the development of BPD, emphasizing the critical role of traumatic experiences in the etiology of this disorder [46, 61, 76, 77].

Findings identified four significant predictors of psychotic experiences and severity: BPD, physical neglect, sexual abuse, and age. Subsequently, these predictors were consistent in their influence across both psychotic experiences and psychotic distress, confirming the previous research [78]. Moreover, findings revealed that BPD is the strongest predictor of the presence and severity of psychotic symptoms in individuals. This finding is consistent with previous research on the prevalence of psychotic-like symptoms in individuals with BPD (*e.g.*, visual and auditory hallucinations, paranoia, transient psychotic episodes, and delusions). Another predictor revealed was the age of the study participants, which was negatively linked to the psychotic experience. This finding confirms existing research that younger individuals have higher levels of psychotic experiences [79].

Physical neglect appeared as a significant predictor for both psychotic experiences and psychotic distress. This suggests that childhood physical neglect contributes to increased psychotic symptoms. In addition, sexual abuse showed a moderate inclusion probability for psychotic experiences and psychotic distress. This finding is consistent with studies suggesting that childhood sexual abuse is a significant risk factor for developing BPD [80], and psychotic experiences of abnormal perception [81]. Thus, younger individuals diagnosed with BPD and having experienced a traumatic childhood trauma of physical neglect and/or sexual abuse would experience more frequent and more severe psychotic symptoms compared to other people.

Furthermore, the findings revealed a significant positive direct effect of physical neglect on psychotic experiences, as well as an indirect effect mediated by BPD. Thus, physical neglect significantly predicted BPD, which in turn significantly predicted psychotic experiences. This interesting finding of our study was in line with growing yet scarce research on the effect of physical neglect on psychotic presentation in general and in BPD individuals in particular. Physical neglect was found to be the key predictor of psychotic symptoms and distress. This might be explained with the findings by Schreier *et al*. [82] that only childhood physical neglect experiences (like having to wear dirty clothes, *etc*.), but not other forms of childhood trauma measured with CTQ, were related to the exaggerated inflammatory responses to stress and subsequent changes in gene expression. This also aligns with the postulate of the core role of invalidating environment in BDP development in Linehan's Biosocial Theory. Usually, researchers elicit four characteristics of invalidating environments, including communication of inaccuracy, misattribution, discouragement of negative emotional expression, and problem oversimplification [83]. However, recent studies highlighted that physical neglect was as damaging as abuse since it disrupted early peer- or parent-child relationships and thus reinforced invalidating environments [84]. Emerging studies indicated the role of exposure to parental maltreatment – including neglect – in a general experience of invalidating environment [85].

5. LIMITATIONS

There are several limitations to this study. First, the cross-sectional design limits the ability to establish the causal relationship between psychotic symptoms and childhood trauma among individuals with BPD. Second, the reliance on self-reported measures for psychotic experiences and childhood trauma may introduce recall bias and affect the accuracy of the data. Third, the snowball and convenience sampling method employed in the study may have introduced selection bias, as participants were not randomly selected. This limits the representativeness of the sample, increasing the likelihood that the types of childhood trauma, along with the psychotic experiences and distress, may be overrepresented or underrepresented among our study participants. Additionally, the prevalence of females in the sample and the geographical restriction to Egypt may limit the generalizability of our findings to other populations. Despite these limitations, the study gives insights into the complex relationship between psychotic experiences and childhood trauma in individuals with BPD.

CONCLUSION

The study findings provide evidence for the strong associations between psychotic experiences, their severity (distress), and childhood trauma among individuals with BPD. Individuals with BPD reported significantly higher levels of all types of childhood trauma compared to controls. The differential analysis of the specific influence of childhood trauma types on BPD and its psychotic symptoms identified that sexual abuse and physical neglect strongly predicted the latter. Furthermore, physical neglect emerged as the strongest predictor of both BPD and psychotic symptoms.

By integrating Linehan's Biosocial Model with trauma theory, this study highlighted that early physical neglect – often overlooked in BPD models – may strongly contribute to shaping invalidating environments and thus influencing BPD symptom expression. Therefore, this study provides culturally relevant insights into the differential role of

childhood trauma in BPD development and psychotic distress in non-western contexts. These findings emphasize the importance of trauma-informed interventions, particularly addressing early neglect-related adversity, to reduce the risk of severe psychotic symptoms in BPD individuals.

UNRESOLVED QUESTIONS AND FUTURE RESEARCH DIRECTIONS

Nevertheless, several unresolved questions remain, which may be the focus of further research. For instance, the specific mechanisms through which neglect contributes to psychotic symptoms – through neurobiological dysregulation, invalidation, and/or maladaptive coping strategies – need deeper examination. Additionally, examining cultural differences in the differential impact of trauma types on BPD and its symptom expression would contribute to the generalizability of findings.

THEORETICAL IMPLICATIONS

This study expands existing literature by integrating physical neglect within the invalidating environment framework of Linehan's Biosocial Theory of BPD development [56]. This suggests that lack of basic caregiving, physical support, and neglect-related childhood trauma may disrupt emotion regulation, enabling maladaptive coping mechanisms. Although recent studies have begun to examine the role of physical neglect within invalidating environments, they are not directly related to BPD and psychotic experiences. By filling this gap, the present study contributes to the yet limited discourse on how neglect-specific trauma contributes to shaping an invalidating environment and thus uniquely impacts BPD symptom expression.

Furthermore, this study contributes to understanding BPD development and its psychotic symptoms within the trauma theory framework by highlighting the differential effects of childhood trauma types. While most studies have focused on the effects of sexual and physical abuse on BPD, this study shows that physical neglect is a distinct predictor of BPD and psychosis. Additionally, by examining this association in an Egyptian sample, the study broadens the literature on trauma and psychotic distress in non-Western populations, where cultural differences in caregiving and child trauma exposure may influence BPD symptom expression.

PRACTICAL IMPLICATIONS

These findings offer several practical interdisciplinary applications in the areas of mental health, social work, and education. Given that physical neglect emerges as a key predictor of BPD and psychotic symptoms, neglect-specific psychological assessments could be employed in addition to the traditional diagnostic frameworks to enhance early identification. Besides, trauma-informed interventions addressing BPD symptomology may specifically focus on neglect-related vulnerabilities through attachment-based therapies and resilience-building techniques, to mitigate long-term psychological effects of childhood adversity.

Since individuals with BPD who experience early physical neglect and other childhood trauma often develop social withdrawal and distorted perceptions of interpersonal relationships, these maladaptive patterns may reinforce emotional dysregulation and unstable relational dynamics. Community-based support and relational interventions may counter these effects by promoting social resilience and adaptive coping strategies. This may mitigate long-term psychological consequences associated with BPD.

Finally, in the field of educational psychology, these findings emphasize the critical role of early intervention within school settings, highlighting the need for incorporating early intervention programs in child-protection policies at schools and caregiver education to reduce long-term mental health consequences of early deprivation. In particular, social-emotional learning (SEL) programs may offer structured emotional regulation support for students from adverse childhood backgrounds. Moreover, training teachers and school counsellors to recognize trauma-related behavioral patterns and implement supportive, inclusive classroom strategies may serve as a protective mechanism against further psychosocial deterioration in individuals at risk of BPD development.

AUTHOR'S CONTRIBUTIONS

The authors confirm their contribution to the paper as follows: J.K.: Data Analysis or Interpretation; M.A.Z., J.K., R.A.N.: Draft manuscript. All authors reviewed the results and approved the final version of the manuscript.

LIST OF ABBREVIATIONS

BPD	=	Borderline Personality Disorder
BSL-23	=	The Borderline Symptom List
PQ-B	=	The 21-item Prodromal Questionnaire, Brief Version
CTQ	=	The 28 item Childhood Trauma Questionnaire–Short Form
GLM	=	Generalized Linear Model
AMOS	=	Analysis of Moment Structures
HPA	=	Hypothalamic Pituitary Adrenal
SEL	=	Social Emotional Learning

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The study was reviewed and approved by the Ethical approval for the study was granted by the Faculty of Arts and Humanities (FOAH) Ethics Committee at the British University in Egypt under the approval No. 24-1112.

HUMAN AND ANIMAL RIGHTS

All procedures performed in studies involving human participants were in accordance with the ethical standards of institutional and/or research committee and with the 1975 Declaration of Helsinki, as revised in 2013.

CONSENT FOR PUBLICATION

All participants provided informed consent prior to data collection, in line with institutional and established ethical standards. As no personal or identifiable information was collected or published, specific consent for publication was not required. Data were anonymized and presented in aggregate, ensuring participant confidentiality.

STANDARDS OF REPORTING

STROBE guidelines were followed.

AVAILABILITY OF DATA AND MATERIALS

The data supporting the findings of the article is available in the Open Science Framework (OSF) at https://osf.io/ctga9/, reference number DOI 10.17605/OSF.IO/CTGA9.

FUNDING

None.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the effort and contributions of our research assistant, Martina Helmy, in collecting important data to support this research.

REFERENCES

[1] Leichsenring F, Fonagy P, Heim N, *et al*. Borderline personality disorder: A comprehensive review of diagnosis and clinical presentation, etiology, treatment, and current controversies. World Psychiatry 2024; 23(1): 4-25. http://dx.doi.org/10.1002/wps.21156 PMID: 38214629

[2] Zanarini MC, Yong L, Frankenburg FR, *et al*. Severity of reported childhood sexual abuse and its relationship to severity of borderline psychopathology and psychosocial impairment among borderline inpatients. J Nerv Ment Dis 2002; 190(6): 381-7. http://dx.doi.org/10.1097/00005053-200206000-00006 PMID: 12080208

[3] Al-Alem L, Omar HA. Borderline personality disorder: An overview of history, diagnosis and treatment in adolescents. Int J Adolesc Med Health 2008; 20(4): 395-404. http://dx.doi.org/10.1515/IJAMH.2008.20.4.389 PMID: 19230440

[4] Abdelkarim A, Radwan A. Attitude of mental health care professionals toward borderline personality disorder sufferers in Egypt. Eur Psychiatry 2022; 65(S1): S668-9. http://dx.doi.org/10.1192/j.eurpsy.2022.1719

[5] Amestoy ME, Best MW, Ruocco AC, Uliaszek AA. Borderline personality disorder stigma: Examining the effects of diagnostic disclosure, behavior, and gender as sources of stigma in the general population. Pers Disord 2024; 15(4): 254-63. http://dx.doi.org/10.1037/per0000672 PMID: 38780568

[6] Morsy M, El Ghamry R, Omar A, *et al*. Profile of egyptian patients with borderline personality disorder with and without comorbidity. Egypt J Psychiatry 2021; 42(3): 115. http://dx.doi.org/10.4103/ejpsy.ejpsy_4_21

[7] Barnow S, Arens EA, Sieswerda S, Dinu-Biringer R, Spitzer C, Lang S. Borderline personality disorder and psychosis: A review. Curr Psychiatry Rep 2010; 12(3): 186-95. http://dx.doi.org/10.1007/s11920-010-0107-9 PMID: 20425279

[8] Schroeder K, Fisher HL, Schäfer I. Psychotic symptoms in patients with borderline personality disorder. Curr Opin Psychiatry 2013; 26(1): 113-9. http://dx.doi.org/10.1097/YCO.0b013e32835a2ae7 PMID: 23168909

[9] Gammino L, Pelizza L, Emiliani R, *et al*. Cognitive disturbances basic symptoms in help-seeking patients with borderline personality disorder: Characteristics and association with schizotypy. Early Interv Psychiatry 2025; 19(1): e13557. http://dx.doi.org/10.1111/eip.13557 PMID: 38778517

[10] Belohradova Minarikova K, Prasko J, Houdkova M, *et al*. Hallucinations and other psychotic symptoms in patients with borderline personality disorder. Neuropsychiatr Dis Treat 2022; 18: 787-99. http://dx.doi.org/10.2147/NDT.S360013 PMID: 35422622

[11] D'Agostino A, Rossi Monti M, Starcevic V. Psychotic symptoms in borderline personality disorder. Curr Opin Psychiatry 2019; 32(1): 22-6. http://dx.doi.org/10.1097/YCO.0000000000000462 PMID: 30169467

[12] Gras A, Amad A, Thomas P, Jardri R. Hallucinations and borderline personality disorder: A literature review. Encephale 2014; 40(6): 431-8. http://dx.doi.org/10.1016/j.encep.2014.07.002 PMID: 25063345

[13] Merrett Z, Rossell SL, Castle DJ. Comparing the experience of voices in borderline personality disorder with the experience of voices in a psychotic disorder: A systematic review. Aust N Z J Psychiatry 2016; 50(7): 640-8. http://dx.doi.org/10.1177/0004867416632595 PMID: 26912339

[14] Savero N, Aji A, Alim A, *et al*. Hallucination in patients with borderline personality disorder. J Psychiatry Psychol Behavioral Res 2022; 3(1): 40-2. http://dx.doi.org/10.21776/ub.jppbr.2022.003.01.10

[15] West ML, Guest RM, Carmel A. Comorbid early psychosis and borderline personality disorder: Conceptualizing clinical overlap, etiology, and treatment. Pers Ment Health 2021; 15(3): 208-22. http://dx.doi.org/10.1002/pmh.1509 PMID: 33955194

[16] Adams B, Sanders T. Experiences of psychosis in borderline personality disorder: A qualitative analysis. J Ment Health 2011; 20(4): 381-91. http://dx.doi.org/10.3109/09638237.2011.577846 PMID: 21770785

[17] Biancalani A, Pelizza L, Menchetti M. Borderline personality disorder and early psychosis: A narrative review. Ann Gen Psychiatry 2023; 22(1): 44. http://dx.doi.org/10.1186/s12991-023-00475-w PMID: 37919718

[18] Loewy RL, Pearson R, Vinogradov S, Bearden CE, Cannon TD. Psychosis risk screening with the Prodromal Questionnaire--brief version (PQ-B). Schizophr Res 2011; 129(1): 42-6. http://dx.doi.org/10.1016/j.schres.2011.03.029 PMID: 21511440

[19] Cavelti M, Thompson K, Chanen AM, Kaess M. Psychotic symptoms in borderline personality disorder: Developmental aspects. Curr Opin Psychol 2021; 37: 26-31. http://dx.doi.org/10.1016/j.copsyc.2020.07.003 PMID: 32771980

[20] Zanarini MC, Frankenburg FR, Wedig MM, Fitzmaurice GM. Cognitive experiences reported by patients with borderline personality disorder and axis II comparison subjects: A 16-year prospective follow-up study. Am J Psychiatry 2013; 170(6): 671-9. http://dx.doi.org/10.1176/appi.ajp.2013.13010055 PMID: 23558452

[21] Schultz HE, Hong V. Psychosis in borderline personality disorder: How assessment and treatment differs from a psychotic disorder. Curr Psychiatr 2017; 16(14): 24-9.

[22] Yee L, Korner AJ, McSwiggan S, Meares RA, Stevenson J. Persistent hallucinosis in borderline personality disorder. Compr Psychiatry 2005; 46(2): 147-54. http://dx.doi.org/10.1016/j.comppsych.2004.07.032 PMID: 15723033

[23] Glaser JP, Van Os J, Thewissen V, Myin-Germeys I. Psychotic reactivity in borderline personality disorder. Acta Psychiatr Scand 2010; 121(2): 125-34. http://dx.doi.org/10.1111/j.1600-0447.2009.01427.x PMID:

19555465
[24] Slotema CW, Blom JD, Niemantsverdriet MBA, Sommer IEC. Auditory verbal hallucinations in borderline personality disorder and the efficacy of antipsychotics: A systematic review. Front Psychiatry 2018; 9: 347. http://dx.doi.org/10.3389/fpsyt.2018.00347 PMID: 30108529
[25] Pearse LJ, Dibben C, Ziauddeen H, Denman C, McKenna PJ. A study of psychotic symptoms in borderline personality disorder. J Nerv Ment Dis 2014; 202(5): 368-71. http://dx.doi.org/10.1097/NMD.0000000000000132 PMID: 24727723
[26] Malafanti A, Yotsidi V, Sideridis G, Giannouli E, Galanaki EP, Malogiannis I. The impact of childhood trauma on borderline personality organization in a community sample of Greek emerging adults. Acta Psychol (Amst) 2024; 244(104181): 104181. http://dx.doi.org/10.1016/j.actpsy.2024.104181 PMID: 38330732
[27] Turki M, Gargouri N, Abdellatif M, *et al*. Borderline personality disorder and childhood trauma: Witch relationship? Eur Psychiatry 2022; 65(S1): S374-4. [Internet]. http://dx.doi.org/10.1192/j.eurpsy.2022.949
[28] Glaser D. Emotional abuse and neglect (psychological maltreatment): A conceptual framework. Child Abuse Negl 2002; 26(6-7): 697-714. http://dx.doi.org/10.1016/S0145-2134(02)00342-3 PMID: 12201163
[29] Porter C, Palmier-Claus J, Branitsky A, Mansell W, Warwick H, Varese F. Childhood adversity and borderline personality disorder: A meta-analysis. Acta Psychiatr Scand 2020; 141(1): 6-20. http://dx.doi.org/10.1111/acps.13118 PMID: 31630389
[30] Zanarini MC, Williams AA, Lewis RE, *et al*. Reported pathological childhood experiences associated with the development of borderline personality disorder. Am J Psychiatry 1997; 154(8): 1101-6. http://dx.doi.org/10.1176/ajp.154.8.1101 PMID: 9247396
[31] Feng X, Zhang X. The impact of childhood maltreatment on risk of borderline personality disorder. Lect Note Edu Psychol Public Media 2023; 3(1): 162-7. http://dx.doi.org/10.54254/2753-7048/3/2022490
[32] Schimmenti A. Unveiling the hidden self: Developmental trauma and pathological shame. Psychodynamic Pract 2012; 18(2): 195-211. http://dx.doi.org/10.1080/14753634.2012.664873
[33] Gratz KL, Tull MT. Borderline personality disorder. 2011. Available from: https://hdl.handle.net/11245/1.502137
[34] Ogłodek E, Araszkiewicz A. [The main directions of research on the causes conditioning the occurrence of the borderline personality disorders]. Pol Merkuriusz Lek 2011; 31(184): 252-5. PMID: 22097186
[35] Picardi A, Giuliani E, Gigantesco A. Genes and environment in attachment. Neurosci Biobehav Rev 2020; 112: 254-69. http://dx.doi.org/10.1016/j.neubiorev.2020.01.038 PMID: 32014527
[36] Granqvist P, Sroufe LA, Dozier M, *et al*. Disorganized attachment in infancy: A review of the phenomenon and its implications for clinicians and policy-makers. Attach Hum Dev 2017; 19(6): 534-58. http://dx.doi.org/10.1080/14616734.2017.1354040 PMID: 28745146
[37] Preti E, Richetin J, Poggi A, Fertuck E. A model of trust processes in borderline personality disorder: A systematic review. Curr Psychiatry Rep 2023; 25(11): 555-67. http://dx.doi.org/10.1007/s11920-023-01468-y PMID: 37889465
[38] Stern BL, Caligor E, Hörz-Sagstetter S, Clarkin JF. An object-relations based model for the assessment of borderline psychopathology. Psychiatr Clin North Am 2018; 41(4): 595-611. http://dx.doi.org/10.1016/j.psc.2018.07.007 PMID: 30447727
[39] Clarkin JF, Lenzenweger MF, Yeomans F, Levy KN, Kernberg OF. An object relations model of borderline pathology. J Pers Disord 2007; 21(5): 474-99. http://dx.doi.org/10.1521/pedi.2007.21.5.474 PMID: 17953502
[40] Girard MS, Morizot J. Is child maltreatment a risk factor for borderline personality disorder? A systematic review of prospective longitudinal studies. Curr Psychiatry Res Rev 2023; 19(3): 262-90. http://dx.doi.org/10.2174/2666082218666220816100950
[41] Skaug E, Czajkowski NO, Waaktaar T, Torgersen S. Childhood trauma and borderline personality disorder traits: A discordant twin study. J Psychopathol Clin Sci 2022; 131(4): 365-74. http://dx.doi.org/10.1037/abn0000755 PMID: 35377676
[42] Yuan Y. Exploring the roles of trauma, emotion dysregulation, and negative affect in borderline personality disorder symptoms among young women. 2020. Available from: http://d-scholarship.pitt.edu/id/eprint/40133
[43] Heim C, Nemeroff CB. The role of childhood trauma in the neurobiology of mood and anxiety disorders: Preclinical and clinical studies. Biol Psychiatry 2001; 49(12): 1023-39. http://dx.doi.org/10.1016/S0006-3223(01)01157-X PMID: 11430844
[44] Juruena MF, Bourne M, Young AH, Cleare AJ. Hypothalamic-Pituitary-Adrenal axis dysfunction by early life stress. Neurosci Lett 2021; 759(136037): 136037. http://dx.doi.org/10.1016/j.neulet.2021.136037 PMID: 34116195
[45] McEwen BS. Stressed or stressed out: What is the difference? J Psychiatry Neurosci 2005; 30(5): 315-8. PMID: 16151535
[46] van der Kolk BA. Developmental trauma disorder: Toward a rational diagnosis for children with complex trauma histories. Psychiatr Ann 2005; 35(5): 401-8. [Internet]. http://dx.doi.org/10.3928/00485713-20050501-06
[47] Al-Shamali HF, Winkler O, Talarico F, *et al*. A systematic scoping review of dissociation in borderline personality disorder and implications for research and clinical practice: Exploring the fog. Aust N Z J Psychiatry 2022; 56(10): 1252-64. http://dx.doi.org/10.1177/00048674221077029 PMID: 35152771
[48] Carpenter RW, Tomko RL, Trull TJ, Boomsma DI. Gene-environment studies and borderline personality disorder: A review. Curr Psychiatry Rep 2013; 15(1): 336. http://dx.doi.org/10.1007/s11920-012-0336-1 PMID: 23250817
[49] Glaser D. Child abuse and neglect and the brain: A review. J Child Psychol Psychiatry 2000; 41(1): 97-116. http://dx.doi.org/10.1111/1469-7610.00551 PMID: 10763678
[50] Herzog P, Kube T, Fassbinder E. How childhood maltreatment alters perception and cognition – the predictive processing account of borderline personality disorder. Psychol Med 2022; 52(14): 2899-916. http://dx.doi.org/10.1017/S0033291722002458 PMID: 35979924
[51] Paulus FW, Ohmann S, Möhler E, Plener P, Popow C. Emotional dysregulation in children and adolescents with psychiatric disorders. A narrative review. Front Psychiatry 2021; 12: 628252. http://dx.doi.org/10.3389/fpsyt.2021.628252 PMID: 34759846
[52] Goodman M, Yehuda R. The relationship between psychological trauma and borderline personality disorder. Psychiatr Ann 2002; 32(6): 337-45. http://dx.doi.org/10.3928/0048-5713-20020601-08
[53] Hayward M, Jones AM, Strawson WH, *et al*. A cross-sectional study of auditory verbal hallucinations experienced by people with a diagnosis of borderline personality disorder. Clin Psychol Psychother 2022; 29(2): 631-41. http://dx.doi.org/10.1002/cpp.2655 PMID: 34322956
[54] Shinn AK, Wolff JD, Hwang M, *et al*. Assessing voice hearing in trauma spectrum disorders: A comparison of two measures and a review of the literature. Front Psychiatry 2020; 10: 1011. http://dx.doi.org/10.3389/fpsyt.2019.01011 PMID: 32153431
[55] Kennedy H. Violence and mental disorder: Clinical considerations. Seminars in Forensic Psychiatry. Cambridge University Press 2024; pp. 36-64. http://dx.doi.org/10.1017/9781911623809.003
[56] Crowell SE, Beauchaine TP, Linehan MM. A biosocial developmental model of borderline personality: Elaborating and

extending linehan's theory. Psychol Bull 2009; 135(3): 495-510. http://dx.doi.org/10.1037/a0015616 PMID: 19379027
[57] Kuo JR, Linehan MM. Disentangling emotion processes in borderline personality disorder: Physiological and self-reported assessment of biological vulnerability, baseline intensity, and reactivity to emotionally evocative stimuli. J Abnorm Psychol 2009; 118(3): 531-44. http://dx.doi.org/10.1037/a0016392 PMID: 19685950
[58] Salavati M, Selby EA. Childhood Maltreatment and Borderline Personality Disorder. Concepts and Empirical Base. Springer Nature. 2025. http://dx.doi.org/10.1007/978-3-031-75503-3_4
[59] Pietrek C, Elbert T, Weierstall R, Müller O, Rockstroh B. Childhood adversities in relation to psychiatric disorders. Psychiatry Res 2013; 206(1): 103-10. http://dx.doi.org/10.1016/j.psychres.2012.11.003 PMID: 23261184
[60] Tyrka AR, Wyche MC, Kelly MM, Price LH, Carpenter LL. Childhood maltreatment and adult personality disorder symptoms: Influence of maltreatment type. Psychiatry Res 2009; 165(3): 281-7. http://dx.doi.org/10.1016/j.psychres.2007.10.017 PMID: 19162332
[61] Ball JS, Links PS. Borderline personality disorder and childhood trauma: Evidence for a causal relationship. Curr Psychiatry Rep 2009; 11(1): 63-8. http://dx.doi.org/10.1007/s11920-009-0010-4 PMID: 19187711
[62] Cotter J, Kaess M, Yung AR. Childhood trauma and functional disability in psychosis, bipolar disorder and borderline personality disorder: A review of the literature. Ir J Psychol Med 2015; 32(1): 21-30. http://dx.doi.org/10.1017/ipm.2014.74 PMID: 30185274
[63] Ibrahim J, Cosgrave N, Woolgar M. Childhood maltreatment and its link to borderline personality disorder features in children: A systematic review approach. Clin Child Psychol Psychiatry 2018; 23(1): 57-76. http://dx.doi.org/10.1177/1359104517712778 PMID: 28617046
[64] Cohen LJ, Tanis T, Bhattacharjee R, Nesci C, Halmi W, Galynker I. Are there differential relationships between different types of childhood maltreatment and different types of adult personality pathology? Psychiatry Res 2014; 215(1): 192-201. http://dx.doi.org/10.1016/j.psychres.2013.10.036 PMID: 24268580
[65] Wu Y, Zheng Y, Wang J, Zhang T. Specific type of childhood trauma and borderline personality disorder in Chinese patients. Front Psychiatry 2022; 13: 936739. http://dx.doi.org/10.3389/fpsyt.2022.936739 PMID: 35958646
[66] Bierer LM, Yehuda R, Schmeidler J, *et al*. Abuse and neglect in childhood: Relationship to personality disorder diagnoses. CNS Spectr 2003; 8(10): 737-54. http://dx.doi.org/10.1017/S1092852900019118 PMID: 14712172
[67] de Aquino Ferreira LF, Queiroz Pereira FH, Neri Benevides AML, Aguiar Melo MC. Borderline personality disorder and sexual abuse: A systematic review. Psychiatry Res 2018; 262: 70-7. http://dx.doi.org/10.1016/j.psychres.2018.01.043 PMID: 29407572
[68] Ogata SN, Silk KR, Goodrich S, Lohr NE, Westen D, Hill EM. Childhood sexual and physical abuse in adult patients with borderline personality disorder. Am J Psychiatry 1990; 147(8): 1008-13. http://dx.doi.org/10.1176/ajp.147.8.1008 PMID: 2375434
[69] Berenbaum H, Thompson RJ, Milanak ME, Boden MT, Bredemeier K. Psychological trauma and schizotypal personality disorder. J Abnorm Psychol 2008; 117(3): 502-19. http://dx.doi.org/10.1037/0021-843X.117.3.502 PMID: 18729605
[70] Read J, Agar K, Argyle N, Aderhold V. Sexual and physical abuse during childhood and adulthood as predictors of hallucinations, delusions and thought disorder. Psychol Psychother 2003; 76(1): 1-22. http://dx.doi.org/10.1348/14760830260569210 PMID: 12689431
[71] Kleindienst N, Jungkunz M, Bohus M. A proposed severity classification of borderline symptoms using the borderline symptom list (BSL-23). Borderline Personal Disord Emot Dysregul 2020; 7(1): 11. http://dx.doi.org/10.1186/s40479-020-00126-6 PMID: 32514359
[72] Savill M, D'Ambrosio J, Cannon TD, Loewy RL. Psychosis risk screening in different populations using the Prodromal Questionnaire: A systematic review. Early Interv Psychiatry 2018; 12(1): 3-14. http://dx.doi.org/10.1111/eip.12446 PMID: 28782283
[73] Bernstein DP, Stein JA, Newcomb MD, *et al*. Development and validation of a brief screening version of the Childhood Trauma Questionnaire. Child Abuse Negl 2003; 27(2): 169-90. http://dx.doi.org/10.1016/S0145-2134(02)00541-0 PMID: 12615092
[74] Bernstein DP, Fink L, Handelsman L, Foote J. Childhood trauma questionnaire. Assessment of family violence: A handbook for researchers and practitioners. Amer Psychological Assn 1998. http://dx.doi.org/10.1037/t02080-000
[75] Yang H. The case for being automatic: Introducing the automatic linear modeling (LINEAR) procedure in SPSS statistics. Mult Linear Regression Viewp 2013; 39(2): 27-37.2013;
[76] Alkema A, Marchi M, van der Zaag JAJ, *et al*. Childhood abuse *v*. neglect and risk for major psychiatric disorders. Psychol Med 2024; 54(8): 1598-609. http://dx.doi.org/10.1017/S0033291723003471 PMID: 38018135
[77] Stickley A, Waldman K, Sumiyoshi T, *et al*. Childhood physical neglect and psychotic experiences: Findings from the National Comorbidity Survey Replication. Early Interv Psychiatry 2021; 15(2): 256-62. http://dx.doi.org/10.1111/eip.12932 PMID: 32048480
[78] Jowett S, Karatzias T, Albert I. Multiple and interpersonal trauma are risk factors for both post-traumatic stress disorder and borderline personality disorder: A systematic review on the traumatic backgrounds and clinical characteristics of comorbid post-traumatic stress disorder/borderline personality disorder groups *versus* single-disorder groups. Psychol Psychother 2020; 93(3): 621-38. http://dx.doi.org/10.1111/papt.12248 PMID: 31444863
[79] Heinze K, Lin A, Nelson B, *et al*. The impact of psychotic experiences in the early stages of mental health problems in young people. BMC Psychiatry 2018; 18(1): 214. http://dx.doi.org/10.1186/s12888-018-1767-y PMID: 29954377
[80] Krause-Utz A, Dierick T, Josef T, *et al*. Linking experiences of child sexual abuse to adult sexual intimate partner violence: the role of borderline personality features, maladaptive cognitive emotion regulation, and dissociation. Borderline Personal Disord Emot Dysregul 2021; 8(1): 10. http://dx.doi.org/10.1186/s40479-021-00150-0 PMID: 33789778
[81] Bell CJ, Foulds JA, Horwood LJ, Mulder RT, Boden JM. Childhood abuse and psychotic experiences in adulthood: findings from a 35-year longitudinal study. Br J Psychiatry 2019; 214(3): 153-8. http://dx.doi.org/10.1192/bjp.2018.264 PMID: 30774061
[82] Schreier HMC, Kuras YI, McInnis CM, *et al*. Childhood physical neglect is associated with exaggerated systemic and intracellular inflammatory responses to repeated psychosocial stress in adulthood. Front Psychiatry 2020; 11: 504. http://dx.doi.org/10.3389/fpsyt.2020.00504 PMID: 32581878
[83] Musser N, Zalewski M, Stepp S, Lewis J. A systematic review of negative parenting practices predicting borderline personality disorder: Are we measuring biosocial theory's 'invalidating environment'? Clin Psychol Rev 2018; 65: 1-16. http://dx.doi.org/10.1016/j.cpr.2018.06.003 PMID: 30055510
[84] Kamis C, Copeland M. Childhood maltreatment associated with adolescent peer networks: Withdrawal, avoidance, and fragmentation. Child Abuse Negl 2024; 158: 107125. http://dx.doi.org/10.1016/j.chiabu.2024.107125 PMID: 39504632
[85] Guérin-Marion C, Martin J, Lafontaine MF, Bureau JF. Invalidating caregiving environments, specific emotion regulation deficits, and non-suicidal self-injury. Child Psychiatry Hum Dev 2020; 51(1): 39-47. http://dx.doi.org/10.1007/s10578-019-00908-2 PMID: 31243625