Dissociation as a Causal Pathway from Sexual Abuse to Positive Symptoms in the Spectrum of Psychotic Disorders

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Abstract

Background: Although numerous studies have supported the role of childhood maltreatment in the etiology of psychosis, underlying mechanisms have not been well understood yet. The present study aimed to investigate the mediating role of particular forms of dissociation in the relationship between five major types of childhood abuse and psychotic symptoms among patients with schizophrenia spectrum and other psychotic disorders.

Methods: In this cross-sectional correlation study, a total of 210 participants, including 140 patients with schizophrenia spectrum and other psychotic disorders (70 first-episode psychotic patients and 70 chronic psychotic patients) and 70 community controls, were selected by systematic random sampling (with the sampling interval of 3) and one-to-one matching, respectively, from among inpatients and outpatients referring to Baharan Psychiatric hospital, Zahedan, Iran, and people living in this region. In this study, the evaluation criteria included Dissociative Experiences Scale, Childhood Trauma Questionnaire-Short Form, and Positive and Negative Syndrome Scale.

Results: The obtained results revealed that the mean scores of sexual abuse, emotional abuse, and physical abuse were higher in psychotic patients than community controls (without any significant difference among first-episode psychotic patients and chronic psychotic patients). Furthermore, the highest mean scores of dissociative experiences belonged to chronic psychotic patients. Regarding the three study groups, there was no significant gender-based difference between mean scores of dissociative experiences and various types of childhood maltreatment. Multiple-mediation also indicated that absorption and dissociative amnesia played a mediating role in the relationship between sexual abuse and positive symptoms. Moreover, this study implied the role of physical abuse in predicting psychotic symptoms even in the absence of sexual abuse.

Conclusions: This study illustrated specific associations among childhood maltreatment, dissociative experiences, and psychotic symptoms in the clinical population. Thus, to provide appropriate interventions, patients with schizophrenia spectrum and other psychotic disorders needed to be asked about a wide range of possible adverse childhood experiences and dissociative experiences. Nevertheless, further studies using prospective or longitudinal designs need to be carried out to realize the differential contribution of various forms of childhood maltreatment and their potential interactions, more precisely.

Background

Childhood adversities have been recognized as a known risk factor for numerous mental disorders [1, 2]. As recently recommended, facing childhood maltreatment, such as sexual abuse, physical abuse, emotional abuse, and neglect, might be accompanied by an increase in psychosis risk [3–7]. In this respect, recent research has reported the prevalence of childhood sexual, physical, and emotional abuse in patients with psychotic disorders as 26, 39, and 34%, respectively, implying the relatively high prevalence of early childhood adversities in this group of patients [8]. These types of childhood maltreatment, which are three times more prevalent in women than men [9], are associated with worse social and cognitive functioning and a dramatic decrease in the quality of life of psychotic patients [10–12].

In recent decades, many studies have been conducted on the relationship between childhood maltreatment and psychotic symptoms, and each one reached fairly different results [13–16]. For example, Sheffield et al. [13] examined 114 patients with psychotic disorders and showed that patients with a history of auditory hallucinations experienced drastically higher sexual, physical, and emotional abuse compared to the patients without any history of auditory hallucinations. They further stated that physical and emotional abuse did not lead to a high rate of auditory hallucinations in the absence of sexual abuse. They did not observe any relationship between childhood maltreatment and other types of hallucinations and delusions. However, Bendall et al. [14] examined 28 patients with psychotic disorders and indicated that histories of childhood maltreatment were related to more severe hallucinations and delusions. The results obtained by Read et al. [15] implied that childhood sexual abuse was more associated with command auditory hallucinations and less with delusions.

They also suggested the marked relationship between delusions and childhood physical abuse, contrary to the results obtained by Bell et al. [16].

Dissociative experiences, which help the integrity of the self in a clinical population as a part of normal psychological life [17], might also coincide with a broad range of psychiatric disorders at a pathologic level (e.g., the spectrum of psychotic disorders) [18–20]. Further, there are still opposing findings showing that certain types of childhood maltreatment are related to dissociative experiences [21–27], which sometimes follows a gender distribution as well [28]. Herein, Braehler et al. [28] examined 62 first-episode psychotic patients, 43 chronic psychotic patients, and 66 community controls and illustrated that chronic psychotic patients experienced higher levels of dissociative symptoms compared to the other two groups, which were strongly associated with childhood maltreatment (particularly emotional abuse). However, this finding is contrary to that obtained by Schäfer et al. [25], who stated that dissociative experiences are state-dependent features that substantially decrease over time. Additionally, Braehler et al. [28] also realized that, compared to women, there was a stronger relationship between Physical neglect and dissociative experiences for men. Nonetheless, they did not observe such gender-based differences in other areas. Further, Sar et al. [22] and Schäfer et al. [24] implied the roles of “physical abuse and physical neglect” and “emotional abuse and physical neglect”, respectively, in predicting dissociative symptoms. However, Schäfer et al. [25] and Schroeder et al. [21] introduced sexual abuse as the major predictor of dissociative symptoms.

Although researchers have paid much attention so far to the relationship between childhood maltreatment and psychotic symptoms in schizophrenia spectrum and other psychotic disorders, causal pathways from various forms of childhood maltreatment to specific psychotic symptoms are still unspecified in this group of patients. Despite that, a hypothesis has been recently proposed by Cole et al. [20] and Varese et al. [23], showing that dissociative experiences might play a mediating role in the relationship between childhood maltreatment and development of psychotic symptoms. Since the identification of effective interventions in the treatment of childhood maltreatment-related psychotic symptoms entails identifying causal pathways of this relationship precisely [29], the present study is designed and conducted based on the following goals: (i) comparing mean scores of dissociative experiences and those of different types of childhood maltreatment such as sexual, physical, and emotional abuse and neglect in three study groups (i.e., first-episode psychotic patients, chronic psychotic patients, and community controls); (ii) making a gender-based comparison of mean scores of dissociative experiences with those of different types of childhood maltreatment such as sexual, physical, and emotional abuse and neglect, (iii) specifying the relationship among different types of childhood maltreatment, dissociative experiences, and psychotic symptoms in the spectrum of psychotic disorders; (iv) determining the mediating role of dissociative experiences in the relationship between childhood maltreatment and psychotic symptoms in the spectrum of psychotic disorders.

Methods

Participants

This cross-sectional correlation study was performed from February to December 2019. Based on Green’s method [30], a total of 140 individuals with schizophrenia spectrum and other psychotic disorders (i.e., patients diagnosed with schizophrenia, schizophreniform disorder, schizoaffective disorder, delusional disorder, and other specified schizophrenia spectrum and other psychotic disorder), including 70 first-episode psychotic patients and 70 chronic psychotic patients, were selected by systematic random sampling method (with the sampling interval of 3) from the inpatients and outpatients referring to Baharan Psychiatric hospital, Zahedan, Iran. Moreover, community controls were recruited through one-to-one matching from the same geographical region (case : control ratio of 1:1; n = 70). The inclusion criteria were: (i) individuals with the diagnoses of schizophrenia spectrum and other psychotic disorders confirmed by an expert psychiatrist via Structured Clinical Interviews for DSM-5: Clinician Version (SCID-5-CV) [31]; (ii) minimum and maximum ages of 18 and 65, respectively; (iii) minimum literacy (comprehension ability); (iv) among community controls: obtaining a score of ≤ 21 in the 28-item General Health Questionnaire (GHQ-28) [32], whose mental health has been confirmed by an expert psychiatrist using SCID-5-CV [31]. The exclusion criteria were: (i) intellectual disability (i.e., intelligence quotient (IQ) score of about 70 or below based on the

Wechsler Adult Intelligence Scale-Revised (WAIS-R) [33]), as well as difficulties in conceptual, social, and practical areas of living [31]; (ii) acute physical disease that needed emergency interventions; (iii) patients with dementia or other severe brain injuries; (iv) deaf patients or those who were not able to have verbal communication; (v) substance/medication induced psychotic disorder; (vi) psychotic disorder due to another medical condition; (vii) incompletely filled questionnaires. The demographic information of participants are listed in Table 1 (N = 210).

Table 1
Demographic information among three study groups (N = 210)

Demographic data	Categories	1 (n = 70)	2 (n = 70)	3 (n = 70)	
		n (%)	n (%)	n (%)	Test[a]
Age	20–29	2 (2.9)	4 (5.7)	3 (4.3)	χ^2 (2) = 0.55
	30–39	13 (18.6)	11 (15.7)	8 (11.4)	
	40–49	28 (40.0)	30 (42.9)	32 (45.7)	
	50–59	15 (21.4)	18 (25.7)	18 (25.7)	
	60–70	12 (17.1)	7 (10.0)	9 (12.9)	
Gender	Male	44 (62.9)	46 (65.7)	44 (62.9)	χ^2 (2) = 0.16
	Female	26 (37.1)	24 (34.3)	26 (37.1)	
Education level	Illiterate	4 (5.7)	3 (4.3)	2 (2.9)	χ^2 (2) = 0.43
	non-degree	44 (62.9)	47 (67.1)	45 (64.3)	
	high school diploma	19 (27.1)	17 (24.3)	19 (27.1)	
	Academic degree	3(4.3)	3 (4.3)	4 (5.7)	

Note.[1]First-episode psychotic patients; [2]Chronic psychotic patients; [3]Community controls.

Note.[a]Statistical analyzing applied chi-square test and Kruskal-Wallis test.

$^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$.

Procedures

After approving the research project and being permitted by the Zahedan University of Medical Sciences Research Ethics Committee (REC) Reg no. IR.ZAUMS.REC.1398.413, consent forms were given to all of the participants. After obtaining the consent from the participants, the patients with schizophrenia or other psychotic disorders were divided into first-episode psychotic patients and chronic psychotic patients based on the fact that they experienced the first episode of psychosis or had been experiencing it for more than two years, respectively [34]. After ensuring the matching of the three study groups in terms of demographic features, Dissociative Experiences Scale (DES) and Childhood Trauma Questionnaire-Short Form (CTQ-SF) were given to the participants of the three groups, whereas Positive and Negative Syndrome Scale (PANSS) were only given to the patients with schizophrenia and other psychotic disorders. Moreover, the patients with schizophrenia spectrum and other psychotic disorders were assessed via a Structured Clinical Interview for DSM-5 Personality Disorders (SCID-5-PD) [35] and SCID-5-CV [21] in terms of comorbidity with borderline personality disorder and dissociative disorders. To abide by the declaration of Helsinki36]], the individuals were told that their participation was voluntary and they could leave the study for any reason. Also, questionnaires were anonymous to keep participants' information confidential.

Measures

The Persian version of CTQ-SF was used to investigate childhood maltreatment. This 28-item questionnaire includes 5 main components, i.e., emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect, which are scored on a 5-point Likert scale. In Iran, Garrusi and Nakhaee [37] reported the test-retest reliability coefficient of this questionnaire to be 0.90. They also reported the internal consistency reliability coefficients for the four subscales of nonsexual abuse, sexual abuse, emotional neglect, and physical neglect to be 0.86, 0.85, 0.84, and 0.6, respectively, with an average of 0.79. In addition, the Persian version of CTQ-SF showed an adequate convergent validity with the GHQ-28. In our study, the Cronbach's alpha coefficient ranged from 0.64 to 0.88 for all of the subscales of CTQ-SF.

DES

The Persian version of DES was employed to assess dissociative symptoms. In this 28-item questionnaire, participants are asked to evaluate their experiences for each element based on a 10-point scale from never (0%) to always (100%). Sajadi et al. [38] reported the Cronbach's alpha coefficient of this scale to be 0.92 for Persian cases. Using factor analysis, they also showed three factor structures, i.e., dissociative amnesia, depersonalization/derealization, and absorption, and scored each of them separately. In our study, the Cronbach's alpha coefficient was 0.90 for DES total score and 0.85, 0.87, and 0.79 for the subscales of dissociative amnesia, depersonalization/derealization, and absorption, respectively.

PANSS

The severity of psychotic symptoms was investigated using the Persian version of PANSS. This is a 30-element questionnaire that includes three subscales of positive symptoms (7 questions), negative symptoms (7 questions), and general psychopathology symptoms (16 questions), which are scored based on a 5-point Likert scale (1 = absent, 2 = minimal, 3 = moderate, 4 = severe, and 5 = extreme). Accordingly, the minimum and maximum scores are 30 and 150, respectively. In Iran, Heshmati [39] estimated the Cronbach's alpha coefficient of this scale at 0.77, and its validity was confirmed according to the factor analysis results. We reported the Cronbach's alpha coefficient for the subscales of positive symptoms, negative symptoms, and general psychopathology symptoms to be 0.80, 0.78, and 0.70, respectively.

SCID-5-CV

SCID-5-CV is a structured interview for major DSM-5 diagnoses, conducted by a trained clinician or a health expert familiar with diagnostic criteria and classification of disorders in DSM-5. Numerous studies have reported acceptable reliability and validity of SCID-5-CV [31].

SCID-5-PD

This tool is a structured diagnostic interview for clinicians and researchers to assess the 10 DSM-5 personality disorders across clusters A, B, and C and other specified personality disorders. The reliability and validity of SCID-5-PD have been found suitable in different studies [35].

GHQ-28

This 28-item questionnaire is scored based on a 4-point Likert scale (0–3); its overall scores thus range between 0 and 84. One score lower than 21 stands for the mental health of an individual. In Iran, Taghavi [32] reported the Cronbach's alpha coefficient for the total scale to be 0.93. He also performed the factor analysis and managed to show the four factors of depression, anxiety, social dysfunction, and somatic symptoms. In our research, the Cronbach's alpha coefficient for the total scale was obtained of 0.84.

WAIS-R

IQ was measured via WAIS-R, whose validity and reliability had been investigated in an Iranian study [33]. Subscales of WAIS-R showed the validity of 0.69–0.87 in the test-retest stability. Furthermore, their internal consistency was estimated at 0.77–0.88 using the split-half method. WAIS-R was performed by a trained clinical psychologist.

Statistical analysis

Statistical analysis was performed using descriptive statistics, such as mean and standard deviation. Chi-square test was performed to compare demography among the three study groups. Further, the analysis of variance (ANOVA) was utilized to compare the mean scores of CTQ-SF and DES in the three study groups. In ANOVA, the Scheffé test is used for post hoc analysis. In addition, in the three study groups, the mean scores of CTQ-SF, DES, and PANSS were compared based on gender via the independent t-test. Subsequently, in the two groups of first-episode psychotic patients and chronic psychotic patients, the Pearson correlation coefficient was employed to assess the relationship between the study variables. Further, to examine the mediating role of dissociation in the relationship between childhood maltreatment and positive symptoms in the two study groups, the Hayes' PROCESS macro method was implemented for SPSS [40]. As stated by Preacher and Hayes [41], the mediating role exists when the indirect effect is significant and confidence intervals exlude a zero value. Also, the data were analyzed by SPSS v25 software at the significance level of $p < 0.05$.

Results

Preliminary analysis

The comparison of mean scores of different types of childhood maltreatment in the three study groups showed that psychotic patients (i.e., first-episode psychotic patients and chronic psychotic patients), compared to the community controls, received higher scores in the subscales of sexual abuse, emotional abuse, and physical abuse, which were statistically significant ($p < 0.001$, $p = 0.001$, and $p < 0.001$, respectively). However, no significant difference was observed between first-episode psychotic patients and chronic psychotic patients. In addition, ANOVA and post hoc analysis revealed no significant difference in the mean scores of the subscales of emotional neglect and physical neglect among the three study groups. Mean scores of dissociative experiences showed a significant difference among the three study groups ($p < 0.001$), such that the results obtained from the post hoc analysis implied higher mean scores of dissociative experiences in chronic psychotic patients (see Fig. 1).

Based on Table 2, the gender-based comparison of mean scores of dissociative experiences and different types of childhood maltreatment showed an insignificant difference in the three study groups.

Table 2
The gender-based comparison of mean scores of dissociative experiences and different types of childhood maltreatment among three study groups (N = 210)

Variables	Gender	1 (n = 70)	2 (n = 70)	3 (n = 70)
		M (SD)	M (SD)	M (SD)
SA	Male	5.86 (0.88)	6.05 (0.89)	1.65 (0.24)
	Female	3.98 (0.78)	5.21 (1.06)	2.17 (0.42)
	Test[a]	t (66.55) = 0.68	t (68) = 1.51	t (68) = 0.07
EA	Male	5.62 (0.84)	6.60 (0.97)	4.37 (0.66)
	Female	5.83 (1.14)	7.13 (1.45)	4.59 (0.90)
	Test[a]	t (68) = 1.28	t (68) = -1.31	t (68) = -0.45
PA	Male	5.26 (0.79)	5.11 (0.75)	1.75 (0.26)
	Female	4.07 (0.79)	4.35 (0.88)	3.32 (0.65)
	Test[a]	t (68) = -1.09	t (68) = 0.32	t (68) = -0.77
EN	Male	3.96 (0.59)	5.18 (0.76)	5.05 (0.76)
	Female	4.26 (0.83)	4.61 (0.94)	3.81 (0.74)
	Test[a]	t (68) = 1.37	t (68) = -0.11	t (63.80) = 0.31
PN	Male	4.73 (0.71)	4.50 (0.66)	4.78 (0.72)
	Female	5.34 (1.04)	4.78 (0.97)	4.67 (0.91)
	Test[a]	t (68) = -1.11	t (68) = 0.09	t (68) = 0.97
D1	Male	12.23 (1.84)	14.01 (2.06)	6.54 (0.98)
	Female	8.33 (1.63)	12.45 (2.54)	6.25 (1.22)
	Test[a]	t (66.50) = 0.36	t (68) = 0.93	t (68) = -0.84
D2	Male	11.73 (1.77)	12.86 (1.89)	5.37 (0.81)
	Female	5.45 (1.06)	9.85 (2.01)	7.33 (1.43)
	Test[a]	t (68) = 0.01	t (68) = 1.39	t (68) = -0.42
D3	Male	9.95 (1.50)	13.15 (1.93)	6.81 (1.02)
	Female	3.84 (0.75)	8.59 (1.75)	6.36 (1.24)

Test[a]	t (60.80) = 1.58	t (64.39) = 1.62	t (68) = 0.73

Note. D1: Amnesia; D2: Depersonalization/Derealization; D3: Absorption; EA: Emotional Abuse; EN: Emotional Neglect; PA: Physical Abuse; PANSS1: Positive Symptoms; PANSS2: Negative Symptoms; PANSS3: General Psychopathology Symptoms; PN: Physical Neglect; SA: Sexual Abuse.

Note. [1]First-episode psychotic patients; [2]Chronic psychotic patients; [3]Community controls.

Note. [a]Statistical analyzing applied independent t-test.

Note. $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$.

Moreover, the results obtained from the correlation matrix demonstrated that sexual abuse had a significant and positive correlation with dissociative amnesia ($r = 0.62$, $p < 0.001$), depersonalization/derealization ($r = 0.67$, $p < 0.001$), absorption ($r = 0.64$, $p < 0.001$), positive symptoms ($r = 0.42$, p 0.001), negative symptoms ($r = 0.29$, $p < 0.001$), and general psychopathology symptoms ($r = 0.42$, $p < 0.001$). Physical abuse had also a significant and positive correlation with positive symptoms ($r = 0.31$, $p < 0.001$), negative symptoms ($r = 0.27$, $p < 0.001$), and general psychopathology symptoms ($r = 0.29$, $p < 0.001$). A significant correlation was observed between each subscale of DES and PANSS as well (see Table 3).

Table 3
Correlations of study variables among patients with schizophrenia spectrum and other psychotic disorders (N = 140)

Variables	SA	EA	PA	EN	PN	D1	D2	D3	PANSS1	PANSS2	PANSS3
SA	-										
EA	0.01	-									
PA	0.12	0.09	-								
EN	0.01	0.21^{*}	0.08	-							
PN	-0.07	-0.01	-0.11	0.02	-						
D1	0.62^{***}	0.00	0.16	-0.02	-0.01	-					
D2	0.67^{***}	-0.08	0.07	-0.03	-0.05	0.57^{***}	-				
D3	0.64^{***}	0.02	0.10	-0.07	-0.00	0.72^{***}	0.68^{***}	-			
PANSS1	0.42^{***}	0.11	0.31^{***}	0.08	-0.05	-0.48^{***}	-0.28^{**}	0.45^{***}	-		
PANSS2	0.29^{***}	0.02	0.27^{**}	-0.07	0.00	0.26^{**}	0.27^{**}	-0.33^{***}	0.04	-	
PANSS3	0.42^{***}	0.15	0.29^{***}	0.00	0.04	-0.42^{***}	-0.37^{***}	0.53^{***}	0.49^{***}	0.24^{**}	-

Note. D1: Amnesia; D2: Depersonalization/Derealization; D3: Absorption; EA: Emotional Abuse; EN: Emotional Neglect; PA: Physical Abuse; PANSS1: Positive Symptoms; PANSS2: Negative Symptoms; PANSS3: General Psychopathology Symptoms; PN: Physical Neglect; SA: Sexual Abuse.

$^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$.

Predictors of positive, negative, and general psychopathology symptoms

Table 4 presents a summary of regression analysis results. In model 1, the results showed that sexual abuse ($\beta = 0.32$, $p = 0.046$), dissociative amnesia ($\beta = -0.16$, $p = 0.025$), absorption ($\beta = 0.20$, $p = 0.038$), and physical abuse ($\beta = 0.41$, $p = 0.001$) could predict 33% of the variance of positive symptoms among the patients with schizophrenia spectrum and other psychotic disorders ($F (5, 134) = 13.76$, p 0.001). In model 2, only physical abuse ($\beta = 0.25$, $p = 0.003$) was able to predict 17% of the variance of negative symptoms ($F (5, 134) = 5.73$, p 0.001). Also, in model 3, only absorption ($\beta = 0.44$, p 0.001)

and physical abuse (β = 0.48, p ≤ 0.001) could predict 35% of the variance of general psychopathology symptoms (F (5, 134) = 14.79, p ≤ 0.001).

Table 4
Model summary of multiple regression analysis to evaluate the predictor variables of psychotic symptoms among patients with schizophrenia spectrum and other psychotic disorders (N = 140)

Model 1 (Response variable: PANSS1): R = 0.58; R^2 = 0.33; F (5, 134) = 13.76***					
Explanatory variables	β	SE	t	LLCI	ULCI
SA	0.32	0.16	2.00*	0.004	0.646
D1	-0.16	0.07	-2.25*	-0.318	-0.021
D2	-0.14	0.08	-1.75	-0.303	0.018
D3	0.20	0.09	2.09*	0.011	0.400
PA	0.41	0.12	3.29**	0.165	0.662
Model 2 (Response variable: PANSS2): R = 0.42; R^2 = 0.17; F (5, 134) = 5.73***					
Explanatory variables	β	SE	t	LLCI	ULCI
SA	0.11	0.11	1.04	-0.103	0.332
D1	0.02	0.05	0.41	-0.079	0.122
D2	0.01	0.05	0.29	-0.092	0.125
D3	-0.12	0.06	-1.84	-0.255	0.008
PA	0.25	0.08	2.96**	0.083	0.421
Model 3 (Response variable: PANSS3): R = 0.59; R^2 = 0.35; F (5, 134) = 14.79***					
Explanatory variables	β	SE	t	LLCI	ULCI
SA	0.23	0.18	1.25	-0.133	0.598
D1	-0.00	0.08	-0.00	-0.170	0.169
D2	-0.03	0.09	-0.37	-0.218	0.149
D3	0.44	0.11	3.92***	0.218	0.662
PA	0.48	0.14	3.39***	0.203	0.770

Note. D1: Amnesia; D2: Depersonalization/Derealization; D3: Absorption; LLCI: Lower Limit of Confidence Interval; PA: Physical Abuse; PANSS1: Positive Symptoms; PANSS2: Negative Symptoms; PANSS3: General Psychopathology Symptoms; SA: Sexual Abuse; ULCI: Upper Limit of Confidence Interval.

*p < 0.05; **p < 0.01; ***p < 0.001.

Mediation analysis

Mediation analysis was performed in SPSS using Hayes' process tool (model = 4, bootstrap samples = 5000). As already assumed, a significant indirect effect of sexual abuse was distinctly observed on positive symptoms through dissociative amnesia and absorption (β = -0.23, 95% confidence interval (CI): -0.497, -0.024; β = 0.24, 95% CI: 0.022, 0.486, respectively). The mediators (i.e., amnesia and absorption) could account for roughly 82% and 85% of the total effect of sexual abuse on

positive symptoms, respectively. Hence, the overall hypothesis that dissociative amnesia and absorption mediate the effect of sexual abuse on positive symptoms was supported (see Fig. 2).

Discussion

To the best of our knowledge, this is the first study on the relationship between childhood maltreatment, dissociative experiences, and psychotic symptoms in Iranian patients with schizophrenia spectrum and other psychotic disorders. Consistent with our predictions, the results of this study indicated that only the mean scores of sexual abuse, emotional abuse, and physical abuse (not mean scores of emotional neglect and physical neglect) were significantly higher in psychotic patients than the community controls. Despite that, no significant difference was observed between first-episode psychotic patients and chronic psychotic patients. These findings were consistent with our a priori hypothesis of the association between childhood abuse and psychotic symptoms, which was proposed by previous studies [13, 42, 43]. For example, Daahlman et al. [43] observed higher rates of childhood sexual and emotional abuse in both groups of hallucinated objects, irrespective of disease status. These findings introduce childhood maltreatment as a specific risk factor for the development of psychotic symptoms. Furthermore, mean scores of dissociative experiences in the three study groups showed a significant difference, and the results obtained from the post hoc analysis confirmed higher mean scores of dissociative experiences in chronic psychotic patients. Previously, Braehler et al. [28] investigated first-episode psychotic patients, chronic psychotic patients, and community controls and realized that chronic psychotic patients experienced higher levels of dissociative symptoms. The greater dissociation in chronic psychotic patients might be attributed to traumatic experiences after childhood; the issue disregarded in the present study. Psychiatric patients, compared to the general population, are more likely to experience additional traumatic events (e.g., assault) in adulthood [44]. Meanwhile, chronic patients might be at a higher risk of re-traumatization due to more coercive admissions and hospitalization [45]. Accordingly, if dissociative symptoms are considered the result of a set of childhood and adulthood traumatic events, chronic psychotic patients are expected to be at a greater risk of more severe dissociation due to experiencing multiple traumas [28]. Nevertheless, further studies are required to investigate potential cumulative effects of adulthood trauma on dissociation. Another probable reason for higher levels of dissociation in the patients with schizophrenia spectrum and other psychotic disorders (particularly chronic psychotic patients) is the etiological and phenomenological overlap between dissociative and psychotic symptoms [46]. In this regard, previous studies identified a subgroup of schizophrenic patients with high levels of childhood maltreatment and dissociation who met diagnostic criteria for borderline personality disorder or dissociative disorders [47]. Childhood adversities have been shown to be higher in schizophrenic patients with comorbid borderline personality disorder than those without borderline personality disorder [48]. Nonetheless, in our study, only four of chronic psychotic patients (including 3 patient with comorbid borderline personality disorder and one patient with comorbid dissociative disorders), and one of first-episode psychotic patients (with comorbid borderline personality disorder) made this explanation improbable.

Moreover, the gender-based comparison of mean scores of dissociative experiences and different types of childhood maltreatment showed no significant difference among the three study groups. Similarly, in first-episode psychotic patients and chronic psychotic patients, no significant gender-based difference was observed in the severity of psychotic symptoms, consistent with the results obtained by Braehler et al. [28]. As interesting findings of our study, the summary of regression analysis results revealed that for the patients with schizophrenia spectrum and other psychotic disorders, positive symptoms were related to sexual abuse, dissociative amnesia, absorption, and physical abuse, negative symptoms were associated with physical abuse, and general psychopathology symptoms were related to absorption and physical abuse. These findings were consistent with studies conducted by Sheffield et al. [13], Bendall et al. [14], and Read et al. [15], whereas they were inconsistent with results obtained by Bell et al. [16]. However, contrary to Sheffield et al. [13], we observed no relationship between emotional abuse and psychotic symptoms. This suggests that further studies are required to decide whether emotional abuse can account for psychotic symptoms or not. In addition, our study illustrated that physical abuse could be associated with psychotic symptoms even in the absence of sexual abuse and dissociation as well. This finding argues that some of the psychotic patients might have adapted differently to childhood adversities. In this respect, observing a relationship between childhood maltreatment and negative symptoms, Vogel et al. [49] concluded that negative symptoms

(i.e., a constant state of down-regulation of emotion and social engagement) could be an alternative adaptive response to childhood adversities.

Beyond the relationship between childhood adversities and adult psychotic-type experience, we were interested in realizing the mechanisms of these relationships. As predicted, dissociation mediated the relationship between sexual abuse and positive symptoms, which agreed with the similar results in clinical groups and preliminary research with non-clinical participants [20, 23, 50, 51]. Overall, this finding supports the information-processing theory proposed by Holmes et al. [52], those who argued that peri-traumatic dissociation has resulted in poorly encoded autobiographical representations by disruption of information processing, which might be later re-experienced as traumatic intrusions (e.g., hallucinations). Further, recent studies have suggested that weakened cognitive inhibition might represent the prevailing cognitive concomitant of dissociation [53]. In line with this theory, recent experimental evidence has highlighted the importance of inhibitory processes in the explanation of auditory hallucinations [54, 55]. Nevertheless, further research is required to determine whether such processes are able to explain the observed relationship between dissociation and positive symptoms in this study or previous studies.

Furthermore, we assessed the effect of particular forms of dissociation via multiple-mediation. The results of the present study revealed that absorption mediated the relationship between sexual abuse and positive symptoms, agreeing with the results obtained by Cole et al. [20] and Perona-Garcelán et al. [51]. Absorption is a form of intensively focused attention wherein an individual becomes immersed in their mental imagery such that these events seem to happen in reality, just like what takes place in a hallucinatory experience [20]. In addition, the confusion between reality and imagination due to the disability to determine the veracity of memories can also lead to a fixed, false, and idiosyncratic belief that is perceived as delusion [20, 51]. We also found out that dissociative amnesia had a mediating role in the relationship between sexual abuse and positive symptoms. Previously, Kennerley [56], following Holmes et al. [52], emphasized distinct functions of different types of dissociation. Indeed, tuning in (absorption) can cause the re-living of intrusive peri-traumatic information in the forms of flashbacks and hallucinations. Tuning out (dissociative amnesia) might make a person unable to access traumatic information in the memory [20]. Accordingly, absorption and dissociative amnesia are expected to have positive and negative mediating roles, respectively, exactly consistent with what was observed in our study. An unexpected finding was about the lack of mediating role of depersonalization/derealization in the relationship between sexual abuse and positive symptoms, consistent with the study by Cole et al. [20] and inconsistent with the results obtained by Perona-Garcelán et al. [50, 51]. This might be due to negligible detrimental effects of non-pathological depersonalization/derealization on processing information related to adverse events in clinical groups [50].

The present study suffered from some methodological limitations. First, the findings could not be generalized to various cases since the sample size was small and participants were selected from a single geographic region. Second, cross-sectional studies mostly fail to specify a definite reason behind a correlation. This restriction might avoid a deep understanding of the essence of the casual relationship between childhood maltreatment, dissociative experiences, and psychotic symptoms. As the third limitation, this study used self-report scales. Generally, the data obtained from such scales can only identify emotions of patients through the assessment, and are not able to reflect their real emotions. Hence, it is suggested that future studies should focus on methodological limitations, such as sole reliance on self-report scales due to memory bias and demand characteristics, lack of empirical data, and disregarding ethnic differences.

Despite the above limitations, our study improved psychopathological comprehension of psychotic symptoms in patients with schizophrenia spectrum and other psychotic disorders. To the best of our knowledge, the present work is the first study that equally assesses and compares the effect of five major types of childhood abuse on various types of psychotic symptoms in Iranian patients with schizophrenia spectrum and other psychotic disorders. This systematic evaluation provided a better opportunity to observe childhood maltreatment as a risk factor for psychosis and allowed us to find specific relationships between sexual abuse, dissociative experiences, and positive symptoms. Understanding such internalized representations can be essential to develop therapeutic interventions and preventive approaches in victims of child maltreatment [57].

Conclusions

In summary, the results of the present study showed that the mean scores of sexual abuse, emotional abuse, physical abuse, and dissociative experiences were higher in psychotic patients (particularly chronic psychotic patients) than community controls. However, in the three study groups, no significant gender-based difference was observed between the mean scores of dissociative experiences and various types of childhood maltreatment. In addition to confirming a relationship between physical abuse and psychotic symptoms (even in the absence of sexual abuse), this study implied the mediating role of absorption and dissociative amnesia in the relationship between sexual abuse and positive symptoms. These findings emphasize the importance of assessing the past history of childhood maltreatment (particularly sexual and physical abuse history) and dissociative experiences in psychotic patients (regardless of their gender) to ensure the proposal of the most suitable and effective therapeutic interventions for this group of patients. Nonetheless, further studies using prospective or longitudinal designs are required to better understand the differential contribution of various forms of childhood maltreatment and their potential interactions.

Abbreviations

ANOVA: Analysis of variance; CTQ-SF: Childhood Trauma Questionnaire-Short Form; DES: Dissociative Experiences Scale; GHQ-28: The 28-item General Health Questionnaire; IQ: Intelligence quotient; PANSS: Positive and Negative Syndrome Scale; SCID-5-CV: Structured Clinical Interviews for DSM-5: Clinician Version; SCID-5-PD: Structured Clinical Interview for DSM-5 Personality Disorders; WAIS-R: Wechsler Adult Intelligence Scale-Revised.

Declarations

Ethics approval and consent to participate

The study was approved by the ethics committee of the Medical Faculty of the ZAUMS Zahedan (IR.ZAUMS.REC.1398.413), and all procedures were in accordance with the latest version of the Declaration of Helsinki. Prior to participation, written informed consent was obtained from all participants and their parents/legal guardians after a comprehensive explanation of the study procedures.

Consent for publication

Not applicable.

Availability of data and materials

The datasets generated and analyzed during the current study are not publicly available because no consent was obtained from the participants in this regard. However, the data are available from the corresponding author on a reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

M.KH., NM.B., and R.K. designed the study, collected the data, conducted the data analysis, drafted the manuscript and interpreted the results. The authors approved the final version of the manuscript.

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Figures

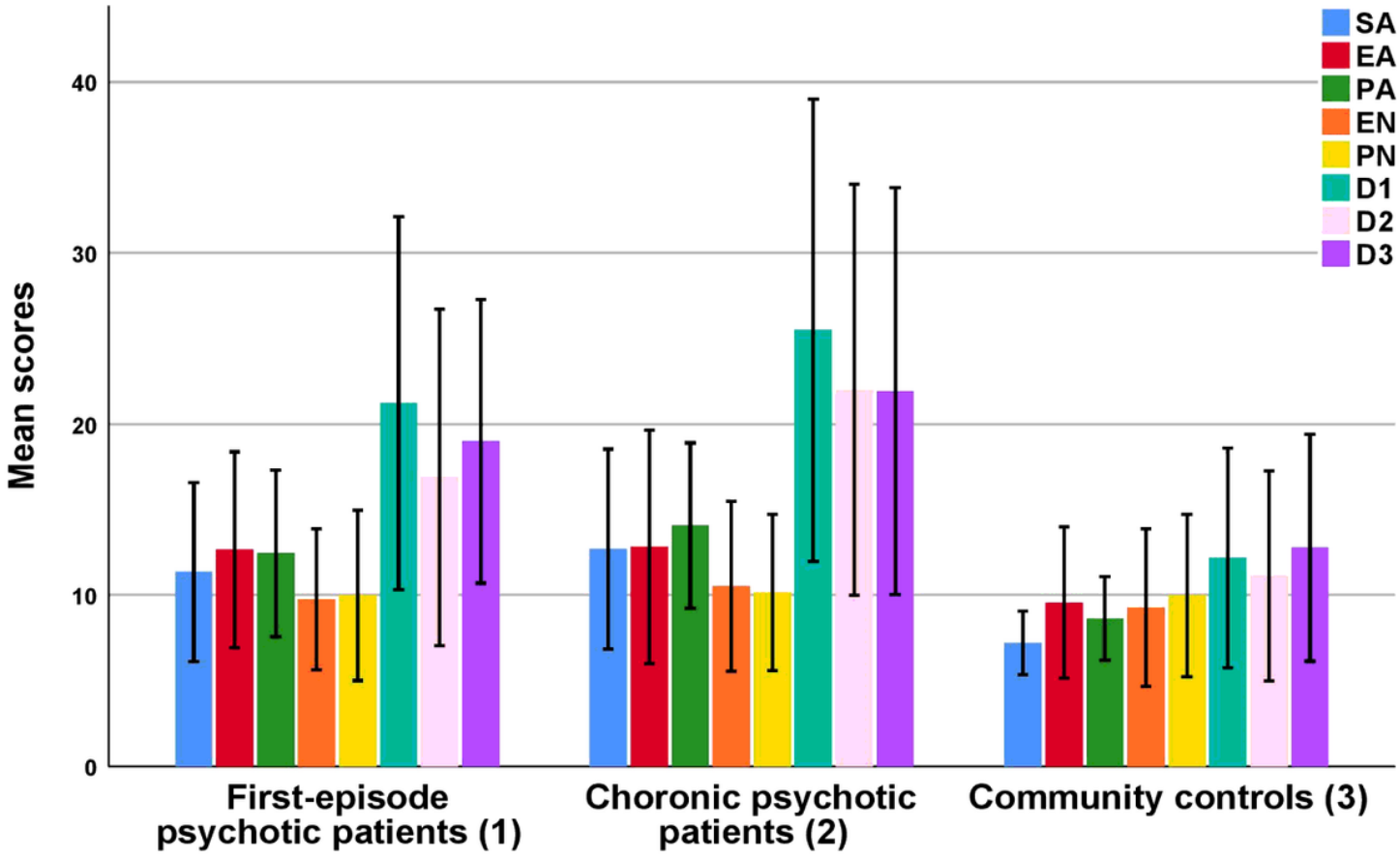

Figure 1

Comparing mean scores of Childhood Trauma Questionnaire-Short Form and Dissociative Experiences Scale among three study groups (N = 210) Note. D1: Amnesia; D2: Depersonalization/Derealization; D3: Absorption; EA: Emotional Abuse; EN: Emotional Neglect; PA: Physical Abuse; PN: Physical Neglect; SA: Sexual Abuse. Note. Statistical analyzing applied analysis of variance (ANOVA); SA: F (2, 207) = 26.47***; Scheffé post hoc test: 1 & 2 > 3 EA: F (2, 207) = 7.06**; Scheffé post hoc test: 1 & 2 > 3 PA: F (2, 207) = 30.71***; Scheffé post hoc test: 1 & 2 > 3 EN: F (2, 207) = 1.66 PN: F (2, 207) = 0.13 D1: F (2, 207) =

33.94***; Scheffé post hoc test: 2 > 1 > 3 D2: F (2, 207) = 28.49***; Scheffé post hoc test: 2 > 1 > 3 D3: F (2, 207) = 21.59***; Scheffé post hoc test: 2 > 1 > 3 *p < 0.05; **p < 0.01; ***p < 0.001.

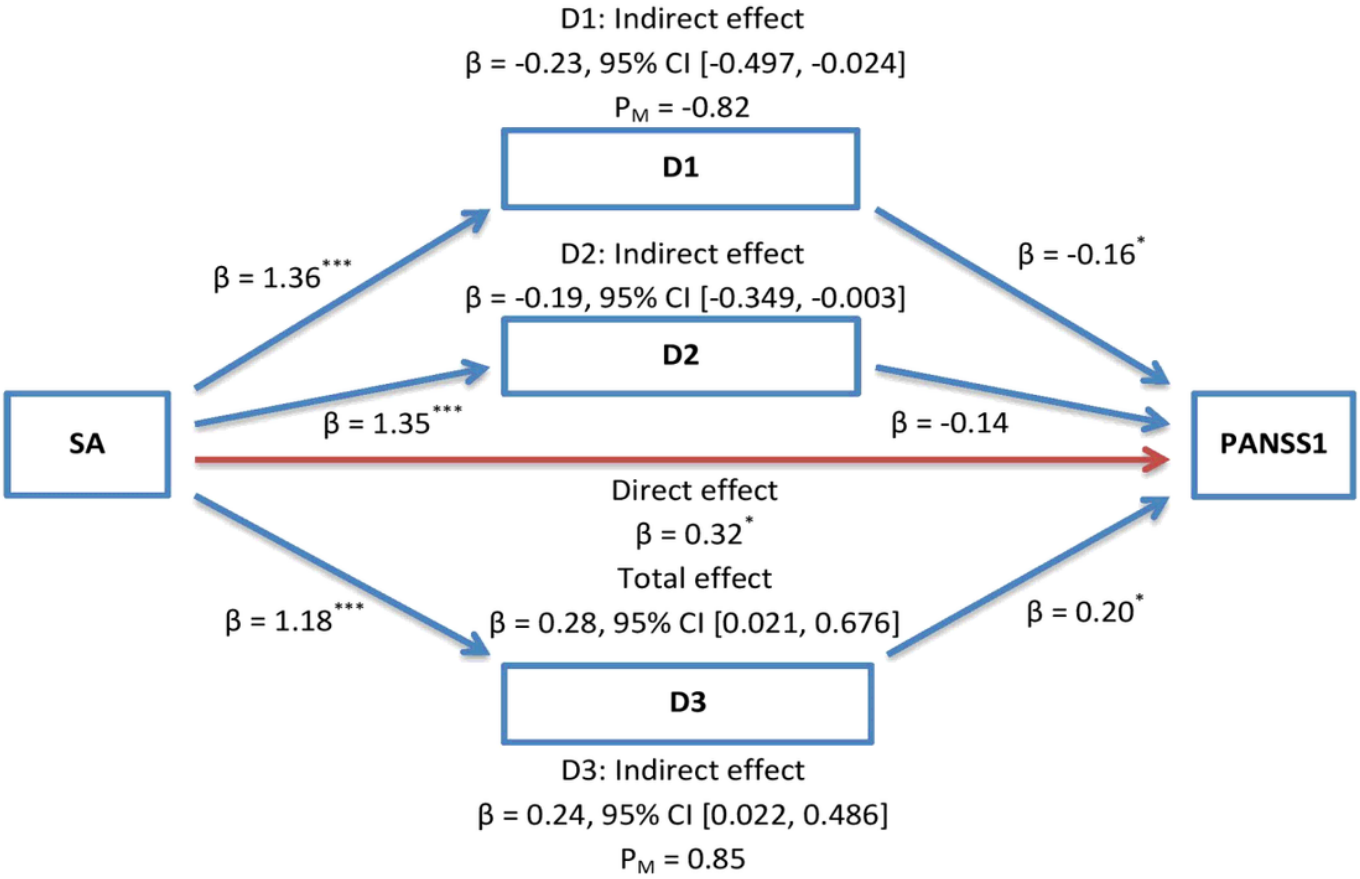

Figure 2

Illustration of the results of the mediation analysis described in the text, which tested dissociative amnesia, depersonalization/derealization, and absorption as the potential mediators of the relationship between sexual abuse and positive symptoms by controlling for physical abuse among patients with schizophrenia spectrum and other psychotic disorders (n = 140) Note. D1: Amnesia; D2: Depersonalization/Derealization; D3: Absorption; PANSS1: Positive Symptoms; SA: Sexual Abuse. PM: Effect size (ratio of indirect to total effect). *p < 0.05; **p < 0.01; ***p < 0.001.