

Research Article

Childhood Trauma Exposure and Severity of Psychotic Symptoms in a First-Episode Psychosis Group in Singapore

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Abstract

Aim: This paper examines the prevalence of childhood trauma as well as its association with severity of psychotic symptoms in patients with first episode psychosis.

Method: Eighty one patients on follow-up with the Singapore Early Psychosis Intervention Programme were recruited for the study. They were administered the Childhood Trauma Questionnaire Short Form (CTQ-SF) to assess history of childhood trauma exposure. Clinical diagnosis was assessed using the Structured Clinical Interview for DSM-IV (SCID-clinician version). Severity of symptoms was assessed by the Positive and Negative Syndrome Scale for Schizophrenia (PANSS) and Global Assessment of Functioning (GAF) scale at baseline, 6 months and 1 year. Socio-demographic and clinical data were compared between the two groups using independent t-test and chi square test followed by multiple linear regressions to adjust for confounder effects.

Results: The mean age of patients was 25.9 (6) years. There were slightly more females (50.6%) than males (49.4%). Prevalence of trauma was 54.3% in the cohort. PANSS negative and total scores were positively and significantly associated with female gender, unemployment and lower education and negatively associated with positive history of childhood trauma. There was a significant improvement in GAF total scores over 1 year of follow-up across the entire cohort (39.7 vs. 67.8, Mean Diff. = -28.1; $p < 0.001$), however, those with a history of childhood trauma had lower mean scores on GAF symptoms scale than those who did not have a history of childhood trauma ($F(df) = 2.7(3,108)$, p value = 0.047).

Conclusion: We found a high prevalence of trauma history in the first episode group, consistent with previous findings. Contrary to our hypotheses, we found that a history of trauma was associated with lower symptom severity at first presentation, especially the negative symptoms. However, we did find that at one year those with a positive history of childhood trauma had lesser improvement in symptom severity compared to those without a history of trauma. Functioning outcome was also worse for those who had experienced trauma in their childhood, making exposure to childhood trauma a poor prognostic factor.

INTRODUCTION

According to the Diagnostic and Statistical Manual of Mental Disorders, trauma is defined as having experienced, witnessed or confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others [1]. The lifetime prevalence of trauma exposure in population surveys is noted to be 60.7% for men and 51.2% for women [2]. Existing literature suggests that there are high incidences of childhood trauma among patients with psychosis [3,4]. In a recent meta-analysis of pooled data examining the risk of childhood adversity and psychosis in case control, prospective, quasi-prospective and population studies, patients with psychosis were 2.72 times more likely to have been exposed to childhood adversity than controls [5]. Elevated incidence of traumatic experiences among individuals with psychosis is not simply due to an increased likelihood of being traumatised after the onset of illness, but many individuals have histories of sexual and physical abuse before the onset of illness. Fisher et al [6] reported that patients with psychosis were three

times more likely to experience maternal physical abuse prior to turning twelve. In terms of specific types of childhood trauma, different types of exposure have been reportedly related to increased risk of developing psychosis. Bebbington et al [7] have reported that individuals with psychosis were 15.5 times more likely to have experienced sexual abuse than individuals without a mental illness. Lysaker, Myers, Evans, Clements, & Mark [8] found that almost a third of patients with schizophrenia have a history of childhood sexual abuse. In a recent study amongst first-episode psychosis patients, Ramsay et al [9] found that rates of childhood abuse and a history of trauma were exceptionally high in their sample. Additionally, they also found that positive symptom severity was associated with certain trauma domains. Similarly, Ross, Anderson & Clark [10] found that those who had suffered child sexual abuse or child physical abuse had significantly more positive schizophrenia symptoms than those not abused. This suggests that exposure to different kinds of trauma may be associated with severity of psychotic symptoms. However, the literature is inconsistent. In a prospective study assessing the impact of child sexual abuse on mental health,

Spataro et al [11] found no support for an association between previous childhood sexual abuse and schizophrenia.

Thus, the link between trauma and psychosis remains debateable and despite recent interest in this area, there is a paucity of studies that examine Asian samples as well as the processes that may explain how trauma may increase vulnerability to psychosis. This study aims to assess the prevalence and association between childhood trauma exposure and severity of psychotic symptoms in patients with first-episode psychosis from the Early Psychosis Intervention Programme in Singapore. We hypothesize that there is an association between a positive history of childhood trauma exposure and particular symptoms of the illness.

METHODS

Participants

The Early Psychosis Intervention Programme was established in Singapore in April 2001 to offer a holistic, comprehensive and accessible service for those at risk of early psychosis in Singapore, in addition to reducing the overall burden and costs of psychosis to the community. In the Early Psychosis Intervention Programme (EPIP), case managers work in a multidisciplinary team, as well as establish links and work collaboratively with community resources, to engage patients in a collaborative, therapeutic relationship. Clinical ratings are collected routinely so as to allow us to continually evaluate and improve our services. Consecutive patients with first-episode psychosis on follow-up from the Early Psychosis Intervention Programme (EPIP) between March 2009 to February 2012 were invited to participate for the study. Inclusion criteria included patients between the ages of 16 to 40 years with diagnosis of schizophrenia spectrum disorder and who were identified by their treating psychiatrist as clinically stable to participate in the study. In addition, patients had to be literate in English so that they could read and understand the Childhood Trauma Questionnaire. Patients who had significant medical problems, substance use, mental retardation or suicidal risk, were excluded from the study. This exclusion criterion was in line with our exclusion criteria for the Early Psychosis Intervention Programme. In total, 595 patients were accepted into the programme during this period; of whom 81 patients were recruited, 41(50.6%) were female and 40(49.4%) were male.

Measures

The Childhood Trauma Questionnaire Short Form (CTQ-SF) is a self-administered scale with 28 questions and takes approximately ten minutes to complete. It provides brief, reliable and valid screening for histories of abuse and neglect [12]. The total CTQ score and each subscale score (emotional, physical, sexual abuse; emotional, physical neglect) was computed and identified as low, moderate or severe levels. The cut off scores in varying ranges mark the different levels of maltreatment experiences [13]. Each subscale is measured in 5 items rated on a 5-point Likert scale from 1 (never true) to 5 (very often true). Cut-off scores for none to low, low to moderate, moderate to severe and severe to extreme exposure were provided for each scale. The CTQ had good internal consistency ($r = 0.63-0.95$) and criterion-related validity ($r = 0.50-0.75$) [14]. Convergent

reliability with therapist assessments of abuse histories has shown to be high. Good specificity and sensitivity of cut-off scores to classify maltreated subjects have been reported as well [15].

Socio-demographic information was obtained using a semi structured questionnaire. Subjects were diagnosed using the Structured Clinical Interviews for DSM-IV (SCID-clinical version) [16] at baseline. As part of their routine assessment, the patients in the programme were assessed with the Positive and Negative Syndrome Scale (PANSS) [17] for Schizophrenia and Global Assessment of Functioning Scale (GAF) [18] at baseline, six and twelve months. These ratings were performed by experienced psychiatrists who were trained in the use of the rating instruments. All raters participated in periodic inter-rater reliability sessions to avoid rater drift. The inter-rater reliability for the PANSS was assessed to be 0.94.

Procedures

Ethics approval for the study was awarded by an institutional research committee. Patients with first-episode psychosis enrolled in the Early Psychosis Intervention Programme during this period were approached by their Case Manager to ask if they would like to take part in the study. After describing the study to the participants, written informed consent was taken from the patient once they agreed. Parental consent was sought for those who were below the age of 21 years. If consent was given, the Childhood Trauma Questionnaire was then administered by the patient's case manager. Prior training in consent taking procedures and administration of the questionnaire had been provided to all case managers in the team. Patients were also briefed by their case managers that if they felt any distress from participation in the study, they may consult their psychiatrist or psychologist immediately for attention.

Statistical Analysis

Logistical regression was conducted to assess for differences in age, gender, ethnicity and baseline PANSS scores between those who responded ($n=81$) and those who did not take part in the study. Participants were then classified into 2 independent groups (those with a positive history of childhood trauma and those with a negative history of childhood trauma) for comparative reasons. Clients who had one or more CTQ scale total scores reaching moderate to severe levels were grouped as having a positive history of childhood trauma. Clients who had low or no CTQ scale total scores were grouped as without a history of childhood trauma. Data was analysed using the Statistical Package for Social Sciences (SPSS Inc). Descriptive statistics were computed for the socio-demographic and clinical variables. Mean and standard deviations were calculated for continuous variables and frequencies and percentages for categorical variables. Multiple linear regression models were used to explore the relationship between childhood trauma and PANSS total, positive, negative and general psychopathology scores at baseline with adjustment for confounder effects including age, gender, ethnicity, marital status, education and employment status. The mean differences in PANSS and GAF scores between two groups (those with a history of childhood trauma and those without a history of childhood trauma) measured over 6 months and 1 year period of follow-up were examined using repeated

measures ANOVA where interaction between time and group effects were modelled in the analysis. Statistical significance for all tests was set at $P < .05$.

RESULTS

Eighty-one patients were enrolled in the study. Table 1 shows the socio-demographic and clinical characteristics of the patients. Most patients were single/unmarried ($n = 68$, 84%) and of Chinese origin ($n = 63$, 77.8%), with a mean age of 25.9 ($sd = 6.0$) years. We found no significant difference in age, gender, ethnicity and baseline PANSS scores between those who responded ($n=81$) and those who did not take part in the study.

Of all the socio demographic characteristics, only gender was significantly correlated with the presence of childhood trauma where females ($OR=2.6$, 95% $CI= 1.1$ to 6.4) had significantly higher risk (Table 2).

Table 3 shows the severity of childhood trauma experienced by patient as measured by the CTQ scale. Among the five domains of trauma assessed by the CTQ-SF, the one with the greatest percentage of patients classified as having severe childhood trauma was emotional neglect (19.8%) followed by both emotional abuse (17.3%) and physical abuse (17.3%). After

combining the 5 domains, we found the prevalence of positive history of childhood trauma to be 54.3% ($n=44$).

Table 4 shows the relationship between childhood trauma and PANSS total, positive, negative and GAF total scores at baseline after adjusted for covariates. We found that a history of childhood trauma was negatively associated with PANSS total scores ($B=-9.5$, 95% $CI = -18.2$ to -0.9 , $P = 0.032$) and PANSS negative scores ($B=-3.4$, 95% $CI = -6.7$ to -0.1 , $P = 0.042$). Unemployment (vs. paid or self-employment, $B=11.7$, 95% $CI = 1.4$ to 21.9, $P = 0.026$) was positively associated with PANSS and GAF total scores; whilst female gender ($B=12.9$, 95% $CI = 4.1$ to 21.7, $P = 0.005$) and primary education (vs. ITE/Vocational, $B=10.4$, 95% $CI = 3.8$ to 16.9, $P = 0.002$) were positively associated with PANSS total scores and PANSS negative scores, respectively.

Over a 6 month period, there were significant reductions in PANSS total (72 vs. 40, Mean Diff. =32; $p < 0.001$), positive (20.6 vs. 8.8, Mean Diff. =11.8; $p < 0.001$) and negative scores (13.4 vs. 9.4, Mean Diff. =4; $p < 0.001$). However, these reductions were not significantly different between the two childhood trauma groups. There were significant increases in GAF total (39.7 vs. 67.8, Mean Diff. = -28.1; $p < 0.001$), symptoms (40.2 vs. 69.3, Mean Diff. = -29.1; $p < 0.001$) and disability scores (43.5 vs. 69.4, Mean Diff. = -26; $p < 0.001$) over 1 year follow-up and these

Table 1: Socio-demographic and clinical data of the sample.

		Frequency	Percentage
Sex	Female	41	50.6
	Male	40	49.4
Ethnicity	Chinese	63	77.8
	Malay	8	9.9
	Indian	6	7.4
	Others	2	2.5
Marital status	Single/ unmarried	68	84
	Married	9	11.1
	Separated	2	2.5
	Divorced	2	2.5
Education	No education	1	1.2
	Primary	5	6.2
	Secondary	26	32.1
	Pre University	9	11.1
	Tertiary (Polytechnic / University)	32	39.5
Employment status	Vocational Institute/ Institute of Technical Education	8	9.9
	Paid or self-employed	25	30.9
	Unemployed	32	39.5
	Student	22	27.2
	Housewife	1	1.2
	Others	1	1.2
	Mean		SD
	Age	25.9	6
	Baseline PANSS Positive	20.9	7.1
	Baseline PANSS Negative	12.9	6.8
	Baseline PANSS General Psychopathology	37.5	10.4
	Baseline PANSS Total	71	17.7
	Baseline GAF Total	40	11.8
	Baseline GAF Symptoms	40.3	12.5
	Baseline GAF Disability	43.7	11.1

Table 2: Socio-demographic correlates of a positive history of childhood trauma.

		OR	95% CI		P value
Age		1.0	0.9	1.1	0.766
Sex	Female	2.6	1.1	6.4	0.037
	Male	1.0			
Ethnicity	Chinese	1.0			
	Malay	2.3	0.4	12.0	0.343
	Indian	0.4	0.1	2.2	0.277
	Others*	.	.		
Marital status	Single/ unmarried	1.0			
	Married	0.4	0.1	1.7	0.214
	Separated/ Divorced	2.4	0.2	23.9	0.465
Education**	Primary and below	1.9	0.3	11.5	0.474
	Secondary	1.3	0.5	3.4	0.582
	Tertiary	1.0			
Employment status*	Paid or self-employment	1.0			
	Unemployed	1.5	0.5	4.5	0.427
	Others	0.8	0.3	2.4	0.666

*OR was not estimated due to small numbers in this group

**Due to small sample size, education and employment categories were collapsed into three groups.

Education:

Primary and below = No education & Primary; Secondary = Secondary;

Tertiary = Pre U, Tertiary and VI/ITE

Employment status:

Paid or self-employment = Paid or self-employment; Unemployed = Unemployed;

Others = Student, Housewife and Others

Table 3: Severity of childhood trauma.

	None		Low (to Moderate)		Moderate (to Severe)		Severe (to Extreme)	
	n	%	n	%	n	%	n	%
Emotional abuse	40	49.4	20	24.7	7	8.6	14	17.3
Physical abuse	49	60.5	11	13.6	7	8.6	14	17.3
Sexual abuse	56	69.1	12	14.8	8	9.9	5	6.2
Emotional neglect	25	30.9	23	28.4	17	21	16	19.8
Physical neglect	37	45.7	22	27.2	11	13.6	11	13.6

Table 4: Relationship between childhood trauma and PANSS total, positive, negative and GAF total scores adjusted for covariates.

Parameter	PANSS Total			PANSS Positive			PANSS Negative			GAF total		
	B	95% CI	p value	B	95% CI	p value	B	95% CI	p value	B	95% CI	p value
Childhood Trauma												
Yes vs. No	-9.5	-18.2--0.9	0.032	-0.7	-4.4-3	0.717	-3.4	-6.7--0.1	0.042	3.4	-2.9-96	0.288
Age	-0.4	-1.3-0.5	0.364	0	-0.3-0.4	0.804	-0.1	-0.5-0.2	0.41	0.2	-0.4-0.9	0.453
Gender												
Female vs. Male	12.9	4.1-21.7	0.005	2.4	-1.4-6.1	0.216	1.5	-1.9-4.8	0.376	-2.4	-8.8-3.9	0.446
Ethnicity												
Malay vs. Chinese	-10	-24.3-4.4	0.17	1.7	-4.5-7.9	0.584	-3.8	-9.3-1.6	0.167	0.5	-9.8-10.9	0.918
Indian vs. Chinese	-2.4	-17.9-13.1	0.761	1.6	-5.1-8.2	0.636	-0.8	-6.7-5	0.777	-0.2	-11.4-11.1	0.978
Others vs. Chinese	.	.	.	.	.	.	.	.	.	.	.	.
Marital status												
Married vs. Single/ Unmarried	-6.7	-24.4-11	0.453	-2.9	-10.5-4.7	0.444	-3.8	-10.5-2.9	0.26	-1.7	-14.5-11.1	0.796
Separated vs. Single/ Unmarried	.	.	.	.	.	.	.	.	.	-1.9	-20.7-16.8	0.836
Divorced vs. Single/ Unmarried	.	.	.	.	.	.	.	.	.	-5.9	-25.3-13.4	0.542

Education level												
No education vs. Tertiary (Poly/University)	-7.5	-49.4-34.5	0.724	-8.9	-26.9-9.1	0.327	9.2	-6.7-25.2	0.251	9.4	-20.9-39.8	0.537
Primary vs. Tertiary (Poly/University)	14.9	-2.3-32.1	0.088	2.1	-5.3-9.5	0.569	10.4	3.8-16.9	0.002	-7.2	-197-5.2	0.249
Secondary vs. Tertiary (Poly/University)	2.3	-8-12.7	0.653	3.1	-1.4-7.5	0.175	2	-2-5.9	0.32	-1.9	-9.4-5.6	0.617
Pre U vs. Tertiary (Poly/University)	4.7	-10.5-19.9	0.54	4.4	-2.1-10.9	0.182	3.5	-2.3-9.2	0.232	-2.0	-13-9	0.718
Vocational / ITE vs. Tertiary (Poly/University)	1.3	-14.1-16.8	0.863	1	-5.6-7.7	0.757	1.4	-4.5-7.3	0.634	-1.7	-12.9-9.4	0.756
Employment												
Unemployed vs. Paid or self-employment	11.7	1.4-21.9	0.026	4.4	0-8.8	0.052	3.1	-0.8-6.9	0.122	-9.2	-16.6—1.8	0.016
Student vs. Paid or self-employment	-2.1	-13.9-9.6	0.719	1	-4-6.1	0.679	-1.6	-6.1-2.8	0.466	-5.3	-13.8-3.2	0.217
Housewife vs. Paid or self-employment	.	.	.	.	.	.	.	.	.	-8.6	-34.2-17.1	0.505
Others vs. Paid or self-employment	.	.	.	.	.	.	.	.	.	7.6	-20.1-35.3	0.585

. Not estimated due to small sample size

Table 5: Comparing mean (SD) scores for PANSS and GAF subscales between Childhood Positive Trauma and Childhood Negative Trauma over 6 months and 1 year follow-up.

Variables		Time	Childhood positive trauma		Childhood negative trauma		F statistic*	DF	p value
			Mean	SD	Mean	SD			
PANSS	total	Baseline	68.9	17.2	73.4	18.2	0.4	1,4,68.4	0.586
		3 months	41.7	11.4	40.5	11.7			
		6 months	39.8	11.6	40.2	11.9			
PANSS	positive	Baseline	21.3	7.4	20.5	6.7	0.1	1,2,58.8	0.778
		3 months	9.5	3.2	8.9	3.1			
		6 months	8.9	3.3	8.7	2.8			
PANSS	negative	Baseline	11.8	6.5	14.2	6.9	0.2	1,5,76.5	0.785
		3 months	9.5	3.3	9.2	3.7			
		6 months	9.4	4.3	9.4	4.3			
PANSS	GPS	Baseline	35.8	9.2	39.4	11.5	0.7	1,4,70	0.440
		3 months	23.0	6.8	22.5	6.6			
		6 months	21.6	6.1	21.4	5.5			
GAF	total	Baseline	40.5	10.5	39.2	13.2	1.9	2,1,76.4	0.159
		3 months	66.4	9.6	66.6	9.3			
		6 months	70.1	11.0	68.7	10.9			
		1 year	63.4	14.2	71.6	11.6			
GAF	symptoms	Baseline	40.7	11.4	39.7	13.8	2.7	3,108	0.047
		3 months	66.9	10.2	67.7	10.1			
		6 months	70.0	11.3	70.1	10.4			
		1 year	64.2	14.3	73.6	11.2			
GAF	disability	Baseline	44.6	9.7	42.6	12.7	1.6	2,71.4	0.219
		3 months	67.5	9.7	67.3	9.7			
		6 months	70.0	11.9	69.1	10.6			
		1 year	65.5	14.8	72.8	11.1			

*Repeated Measures ANOVA test.

improvements were significantly different between the two groups ($F(df) = 2.7(3,108)$, p value = 0.047). At 1 year follow-up, we found that those without a history of childhood trauma had higher GAF symptoms scores than those with those with a history of childhood trauma (73.6 vs. 64.2, p value = 0.014) (Table 5). Similarly, the GAF disability scale scores were higher in those without a history of childhood trauma but this was not statistically significant.

DISCUSSION

Consistent with previous studies, we found a high prevalence of trauma history in our patients with first-episode psychosis [3,4]. It is interesting to note that this study found that among the five domains of trauma assessed by the CTQ-SF, the one with the greatest percentage of patients classified as having severe trauma in the domain was emotional neglect, followed by emotional abuse then sexual abuse. This is quite different from other studies [7,8,19] that found that sexual abuse was the most common trauma experienced. There is but one study [20] that reported findings similar to ours. The sample included 57 first-episode patients and it was found that 40.9% of first-episode patients had experienced childhood emotional abuse and 29.5% had experienced childhood emotional neglect. The authors postulated that studying the first-episode psychosis cohort reduces the potential effects of chronicity and the use of neuroleptics on the reliability of self report and psychotic symptoms.

Contrary to our hypotheses, we found that a history of trauma was in fact associated with lower symptom severity at baseline, especially the negative symptoms. It may be due to the above mentioned reasons that the first episode psychosis group is a less chronic cohort. A similar finding in a population based study done by Spataro et al [11] found no support for the link between childhood sexual abuse and schizophrenia. Further, Greenfield et al [21] report that patients with histories of childhood abuse had significantly more dissociative symptoms, but not more severe other psychiatric symptoms.

It could be that unlike some of the previous studies [7,8,19] most of our patients had experienced higher emotional trauma and not sexual abuse and this could possibly be one of the reasons that we did not find the hypothesized positive association between trauma and higher psychopathology. Another plausible reason for the finding could be due to the high number of patients who had declined to participate in the study. Although there were no known differences between those who responded and those who did not take part in the study, we were not able to ascertain the reasons for their refusal. It could be possible that those who chose not to participate had greater exposure to childhood trauma and found it difficult to talk about it. There is also the possible issue of underreporting which is commonly cited in the literature [22].

Our results did find that a history of childhood trauma led to lesser improvement in symptom severity as measured by the GAF symptoms scale. Studies have suggested that exposure to childhood trauma can affect the sense of trust, prohibiting healthy attachments, creating problems in emotional stability [23]. Further evidence points to that of hormonal imbalances

after exposure to trauma leading to negative coping styles and stress responses [24]. All these factors could be responsible for a poorer prognosis in patients with history of childhood trauma.

The finding of high abuse relating with lower symptom severity yet high functional impairment that does not improve with time suggest that abuse is related to general vulnerability/poor cognition that has a weaker link with psychosis per se. Our findings demonstrate that the link between trauma exposure and psychosis is a complex one and cannot be concluded as a causal one. There is a need to examine the intricacies of the different variables involved, for example, the impact of victimization. Despite the disparate findings, our paper confirmed that a positive history of trauma results in poorer psychosocial and role functioning outcomes [8]. Childhood trauma has also been linked to profound cognitive impairment [25], possibly mediated by changes in the amygdala, and notably in the hippocampus as a result of chronic cortisol overexposure [26]. This could further explain why those with a positive trauma history in our study had lower educational achievements [27,28].

A positive history of childhood trauma is a poor prognostic factor in patients with psychosis. This highlights the implications for proper in-depth assessment, history taking, clinical formulation and the appropriate evidence based intervention in clinical settings. Therapists and clinicians should formulate a client's symptomatology with consideration of the impact of the childhood trauma experienced by the client. Further research is necessary to determine the mechanisms of how trauma exposure affects one's functioning.

Our study's limitations include not having a control group and insufficient detailed information on the time, intensity, duration and frequency of the abuse. A retrospective and self-report measure of childhood trauma was used, which count recall bias as another limitation. Including contemporary case records or input from family members may have improved the reliability of our assessments. However, there would be little ethical alternatives to a retrospective study due to the nature of the study. Furthermore, to increase the reliability, participants were only interviewed when they were in a clinically stable phase. A major limitation of our study is the high refusal rate of participation and may suggest the limited representatively of our results. Despite the limitations mentioned, this is the first known study on the prevalence and impact of childhood trauma in the first-episode psychosis cohort in Singapore. The clinical team from the Early Psychosis Intervention Programme has been briefed on the results of the study and has taken special efforts to assess for trauma history in their intake sessions, as well as being mindful of the potential impact of past trauma in our clients' symptoms in therapy sessions. As this is a correlational study, and causations cannot be ascertained, the results from this study highlight the importance of routine assessment of a history of trauma in standard clinical care.

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