

# Correlation between Stressful Life Events and Suicidal Ideation among Patients with Schizophrenia in Remission Stage: A Cross-sectional Study

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## ABSTRACT

**Introduction:** Patients with schizophrenia often exhibit impaired executive brain function, which disrupts their daily activities. Relapse in schizophrenia has been linked to stressful life events.

**Aim:** To identify the relationship between life event stressors and suicidal ideation among patients with schizophrenia at the remission stage in a tertiary care hospital.

**Materials and Methods:** A cross-sectional study was conducted in the outpatient department of a tertiary care hospital among 120 patients diagnosed with schizophrenia in remission. Screening for eligibility was performed using the Positive and Negative Syndrome Scale (PANSS). Data were collected through a structured questionnaire capturing sociodemographic variables, the Beck's Suicidal Ideation Scale (BSS), and the Presumptive Life Event Stress Scale (PSLES). Statistical analysis was carried out using IBM SPSS version 23.0. A p-value of  $<0.05$  was considered statistically significant.

**Results:** Age, gender, marital status, education, occupation, religion, and socioeconomic status did not significantly influence

BSS scores. Likewise, clinical factors such as frequency of hospitalisation, age of onset, duration of illness, and duration of remission showed no significant relationship with suicidal ideation. Life event stressors were notably prevalent, with marital conflict 65 (54.2%), conflict with in-laws 58 (48.3%), and financial problems 54 (45.0%) being the most commonly reported. Patients experiencing 3-5 stressors and more than 5 stressors had significantly higher mean BSS scores (9.8 and 13.2, respectively) compared to those with 1-3 stressors (6.8), with p-values of 0.008 and  $<0.001$ . Pearson's correlation coefficient ( $r=0.482$ ,  $p<0.001$ ) indicated a moderate positive relationship between cumulative stress and suicidal ideation. The regression model further showed that 23% of the variance in suicidal ideation could be explained by life event stress levels.

**Conclusion:** The study found a significant positive correlation between life event stressors and suicidal ideation in patients with schizophrenia in remission. Routine screening for psychosocial stress may aid in early identification and prevention of suicide risk in this population.

**Keywords:** Beck's suicidal ideation scale, Presumptive life event stress scale, Schizophrenia in remission, Suicidal intent

## INTRODUCTION

Schizophrenia is a chronic, severe, and disabling psychiatric disorder marked by persistent psychotic symptoms, cognitive deficits, and significant psychosocial dysfunction [1]. According to the India State-Level Disease Burden Initiative Mental Disorders Collaborators (2020), approximately 3.5 million individuals (95% Uncertainty Interval (UI): 3.0-4.0) in India were living with schizophrenia, making it the fourth-highest contributor to Disability-Adjusted Life Years (DALYs) among mental disorders. The study reported an increase in prevalence from 1990 to 2017 [2]. Patients with schizophrenia commonly exhibit impairments in executive brain functioning, which disrupts routine activities and independent living [3,4]. A systematic review published in 2016 estimated the global age-standardised point prevalence of schizophrenia to be 0.28% (95% UI: 0.24-0.31) [5].

The association between schizophrenia, insomnia, psychopathology, and suicidal ideation was assessed by Miller BJ et al., [6]. The study involving 328 patients undergoing psychotropic treatment found that psychopathology was significantly associated with suicidal risk and reduced quality of life, especially in adolescents [6]. Suicidal behaviour in schizophrenia may manifest as ideation, planning, attempts, or completed suicide [7]. A meta-analysis of 81 studies reported that individuals with schizophrenia who experienced suicidal ideation were 5.8 times more likely to attempt suicide than those without such ideation [8].

Relapses in schizophrenia have also been linked to stressful life events [9], likely due to dysregulation of the Hypothalamic-Pituitary-Adrenal (HPA) axis following excessive stress exposure [10]. In a study involving 431 individuals with schizophrenia, environmental stressors were frequently observed to precede the onset of positive symptoms [11]. Another investigation among 248 patients found a positive correlation between stressful life events and relapse, and a negative correlation between relapse and the use of positive coping strategies. The authors emphasised the need for interventions that reduce stressors and strengthen adaptive coping mechanisms [12]. However, the studies examining the interplay of life event stress and suicidal ideation specifically during the remission stage of schizophrenia is scarce. Investigating this relationship at remission could provide insights into whether these factors represent a vulnerability or a stable endophenotype, thereby informing tailored management approaches. Against this backdrop, the present study aimed to assess the relationship between life event stressors and suicidal ideation in patients with schizophrenia during the remission phase at a tertiary care hospital. It was hypothesised that the prevalence of suicidal ideation would increase with the number of reported stressors.

## MATERIALS AND METHODS

A cross-sectional study was conducted in the Outpatient Department (OPD) of the Department of Psychiatry, Chettinad Hospital and

Research Institute, Kelambakkam, Chennai, Tamil Nadu, India, from October 2023 to September 2024. Ethical approval was obtained from the Institutional Human Ethics Committee (Ref No: IHEC-I/2010/23), and written informed consent was obtained from all participants prior to data collection.

**Inclusion and Exclusion criteria:** Inclusion criteria comprised patients aged 18-65 years with a clinical diagnosis of schizophrenia in remission, as per the ICD-11 diagnostic criteria [13], and a total PANSS score of less than 60 for a duration exceeding six months [14,15]. This PANSS cut-off ensured adequate specificity and sensitivity for identifying patients in remission (85% specificity and 75% sensitivity), providing a standardised and objective assessment. Exclusion criteria included individuals with organic brain syndromes, developmental disorders, substance use disorders, schizoaffective spectrum disorders, and other comorbid psychiatric illnesses.

**Sample size selection:** The sample size was estimated based on previous research reporting a correlation coefficient of 0.28 [16]. With a 90% power and a 5% level of significance, the minimum required sample size was calculated to be 101. To account for a potential non-response rate of 20%, the final sample size was adjusted to 120 participants. The study included 120 patients diagnosed with schizophrenia in the remission phase. Patients were selected using a non-probability purposive sampling technique based on predefined eligibility criteria.

### Study Procedure

Participants were screened using the PANSS to confirm remission status. Suicidal ideation was assessed using BSS, a validated 19-item clinician-administered tool designed to assess the severity of suicidal thoughts, plans, and behaviours within the past week. Items 1 to 5 serve as initial screening questions, determining whether further assessment is necessary. Items 4 to 19 focus on the intensity of suicidal intent, including factors such as the frequency of ideation, control over suicidal thoughts, preparation for suicide, and deterrents. Each item is scored on a 3-point scale (0 to 2), with higher scores indicating greater suicidal risk [17]. Life event stress was measured using the PSLES, a 51-item checklist that quantifies stress based on life events experienced in the past year. Each item carries a weighted score, with higher total scores indicating greater cumulative stress exposure [18].

### STATISTICAL ANALYSIS

Data were entered into Microsoft Excel, then securely stored. Data cleaning was performed in Excel, and statistical analyses were conducted using IBM Statistical Package for Social Sciences (SPSS) version 23.0. Categorical variables were summarised using frequencies and percentages, and continuous variables were described using measures of central tendency and dispersion. To test for association, independent t-test or One-way Analysis of Variance (ANOVA) with Bonferroni correction was done. A p-value  $<0.05$  was considered statistically significant.

### RESULTS

The mean (SD) age of the study population was 35.8 years (14.3) with 61 males (50.8%) and 59 females (49.2%). In the present study involving 120 patients with schizophrenia in remission, participants aged above 45 years had a slightly higher mean BSS score ( $9.4 \pm 3.2$ ) compared to younger groups, but the difference was not significant ( $p=1.000$ ). Females had marginally higher scores ( $9.2 \pm 3.0$ ) than males ( $8.7 \pm 4.2$ ), with no significant gender-based variation ( $p=0.504$ ). Marital status did not influence suicidal ideation significantly, with married and unmarried individuals showing similar scores ( $p=0.451$ ). Urbanicity, educational status, occupation, and socioeconomic class were not significantly associated with suicidal ideation. Among religious groups, Christians reported the lowest

mean BSS score ( $7.0 \pm 1.2$ ), but overall differences were again non-significant. The mean BSS scores showed no statistically significant differences across demographic and psychosocial categories [Table/Fig-1].

Variables	Frequency N=120		BSS score Mean (SD)	F value	p- value
	n (%)				
Age (in years)	<30	33 (27.5)	8.6 (3.4)	0.396	Ref
	31 to 45	54 (45.0)	8.8 (4.1)		1.000
	>45	33 (27.5)	9.4 (3.2)		1.000
Gender	Male	61 (50.8)	8.7 (4.2)	0.449	0.504
	Female	59 (49.2)	9.2 (3.0)		
Marital status	Married	108 (90.0)	9.0 (3.7)	0.573	0.451
	Unmarried	12 (10.0)	8.2 (3.2)		
Location	Rural	36 (30.0)	8.5 (4.1)	1.002	Ref
	Semiurban	68 (56.7)	9.3 (3.4)		0.877
	Urban	16 (13.3)	8.1 (3.5)		1.000
Education	Illiterate	9 (7.5)	8.1 (2.6)	0.481	0.489
	Primary school and higher	111 (92.5)	9.0 (3.7)		
Occupation	Unemployed	24 (20.0)	9.1 (2.7)	0.089	0.766
	Employed	96 (80.0)	8.9 (3.6)		
Socioeconomic status	Upper middle	28 (23.3)	9.3 (4.5)	0.272	Ref
	Lower middle	51 (42.5)	8.9 (3.7)		1.000
	Upper lower	31 (25.8)	8.5 (2.9)		1.000
	Lower	10 (8.3)	9.3 (2.9)		1.000
Religion	Christian	9 (7.5)	7.0 (1.2)	2.025	Ref
	Hindu	104 (86.7)	9.2 (3.8)		0.256
	Muslim	7 (5.8)	7.6 (2.2)		1.000

**[Table/Fig-1]:** Comparison of suicidal ideation among patients with schizophrenia in remission, by sociodemographic and psychosocial characteristics.

\*Statistically significant at  $p<0.05$ ; BSS: Beck's suicidal ideation scale; SD: Standard deviation

Patients with more than two hospitalisations per year had a slightly higher mean BSS score ( $9.2 \pm 2.8$ ) compared to those with fewer hospitalisations, though the difference was not significant [Table/Fig-2]. Similarly, the mean BSS score was marginally higher in patients with an age of onset between 31-45 years ( $9.2 \pm 4.2$ ) than in those with earlier or later onset, but this difference was not statistically significant. Those with illness duration between 5-10 years had the highest mean BSS score ( $10.5 \pm 4.8$ ), though the association did not reach statistical significance. The duration of remission also showed no significant relationship with suicidal ideation ( $p=0.400$ ), with slightly higher scores among those in remission for less than a year. Overall, none of the clinical characteristics demonstrated a significant impact on suicidal ideation in this cohort.

Among the 120 patients with schizophrenia in remission, marital conflict was the most frequently reported life event stressor, affecting 54.2% ( $n=65$ ) of participants [Table/Fig-3]. This was followed by conflict with in-laws in 58 (48.3%), financial problems in 54 (45.0%), trouble at work with colleagues or superiors in 52 (43.3%), and general family conflict in 47 (39.2%). Notably, only 12 (10%) of the participants reported experiencing no significant life stressors in the past year, indicating a high prevalence of psychosocial stress among the study population.

There was a statistically significant increase in suicidal ideation scores with a greater number of reported life event stressors. Patients reporting 1 to 3 stressors had a mean BSS score of  $6.8 \pm 3.5$ , while those with 3 to 5 stressors had a significantly higher mean score of  $9.8 \pm 4.1$  ( $p=0.008$ ), and those with more than 5 stressors had the highest mean score of  $13.2 \pm 4.8$  ( $p<0.001$ ) [Table/Fig-4]. This

Variables		Frequency N=120	BSS score	F value	p-value
		n (%)	Mean (SD)		
Number of hospitalisation	<1 per year	19 (15.8)	9.1 (4.0)	0.046	Ref
	1-2 per year	96 (80.0)	8.9 (3.7)		1.000
	>2 per year	5 (4.2)	9.2 (2.8)		1.000
Age of onset (in years)	<30	45 (37.5)	8.6 (3.4)	0.364	Ref
	30 to 45	50 (41.7)	9.2 (4.2)		1.000
	>45	25 (20.8)	9.0 (2.9)		1.000
Duration of illness (in years)	<5	94 (78.3)	8.6 (3.2)	2.746	Ref
	5 to 10	24 (20.0)	10.5 (4.8)		0.067
	>10	2 (1.7)	8.0 (5.7)		1.000
Duration of remission (in years)	<1	45 (37.5)	9.3 (3.8)	0.713	0.400
	>1	75 (62.5)	8.7 (3.6)		

[Table/Fig-2]: Comparison of suicidal ideation among patients with schizophrenia in remission, by clinical characteristics.

\*Statistically significant at p&lt;0.05; BSS: Beck's suicidal ideation scale; SD: Standard deviation; Ref: Reference

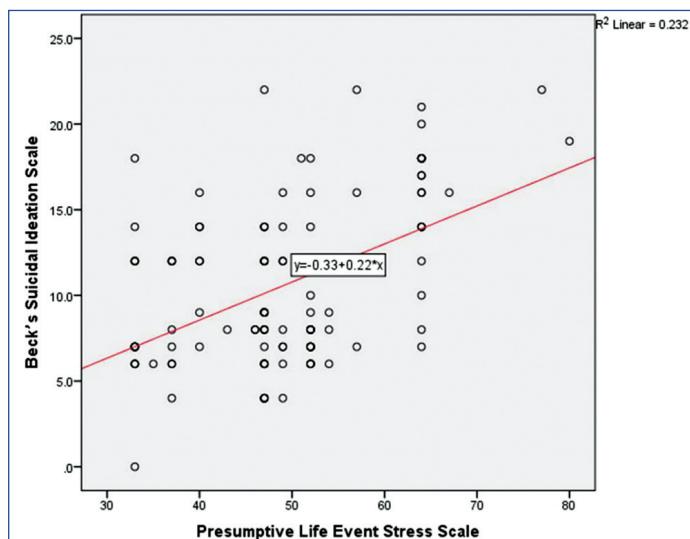
Life event stressors	Frequency (N=120)	Percentage (%)
Marital conflict	65	54.2
Conflict with in-laws	58	48.3
Financial problem	54	45.0
Trouble at work with colleague/superior	52	43.3
Family conflict	47	39.2
No stress	12	10.0

[Table/Fig-3]: Distribution of patients with schizophrenia in remission, by life event stressors.

Number of stressors	Frequency N=120	BSS score	F value	p-value
	n (%)	Mean (SD)		
1 to 3	36 (30.0)	6.8 (3.5)		Ref
3 to 5	49 (40.8)	9.8 (4.1)		0.008*
>5	35 (29.2)	13.2 (4.8)		<0.001*

[Table/Fig-4]: Association between number of life event stressors and suicidal ideation among patients with schizophrenia in remission.

trend was supported by Pearson's correlation coefficient of 0.482 (p<0.001), indicating a moderate positive correlation between the PSLES scores and suicidal ideation. The scatter plot visually reinforces this relationship, displaying a linear regression line with the equation  $y=0.33+0.22x$  and an  $R^2$  value of 0.232, suggesting that approximately 23% of the variance in suicidal ideation scores can be explained by life event stress levels [Table/Fig-5].



[Table/Fig-5]: Correlation between Presumptive Life Event Stress Scale (PSLES) scores and Beck's suicidal ideation scores.

## DISCUSSION

The present study explored the relationship between demographic, psychosocial, and clinical variables and suicidal ideation in patients with schizophrenia in remission. Notably, none of these variables showed a statistically significant association with suicidal ideation as measured by the BSS. These findings are in line with Hor K and Taylor M (2010) and Pompili M et al., (2007) that suggested suicidal ideation in schizophrenia may not be strongly influenced by static sociodemographic factors but rather by dynamic psychological and environmental stressors [19,20]. The absence of significant gender differences in BSS scores aligns with Sher L and Kahn RS (2019) indicating that while males with schizophrenia may exhibit higher rates of suicide completion, the prevalence of suicidal ideation does not differ significantly between sexes [21]. Similarly, although older patients (>45 years) had slightly elevated BSS scores, this difference was not statistically meaningful, supporting a study which suggest that age-related patterns in suicidality among individuals with schizophrenia are inconsistent [22].

Regarding clinical variables, while patients with more frequent hospitalisations and those with illness durations between five and 10 years showed slightly higher BSS scores, the associations were not statistically significant. Prior research has yielded mixed findings on this front, some studies have found that a history of frequent hospitalisations is associated with increased suicide risk due to illness severity or treatment resistance [23], while others emphasise that remission and engagement with psychiatric care can mitigate these risks [24]. The current study also did not find significant differences based on age of onset or duration of remission. While early onset schizophrenia has been linked with poorer functional outcomes and higher suicide risk in some studies [25], others have found that suicidality is more strongly related to insight and depressive symptoms than age of onset or remission length [26].

The findings of this study demonstrate a significant association between the number of life event stressors and suicidal ideation in patients with schizophrenia in remission. Among the life stressors evaluated, marital conflict was the most frequently reported (54.2%), followed closely by conflict with in-laws (48.3%) and financial problems (45.0%). These results underscore the substantial psychosocial burden experienced by individuals with schizophrenia, even during periods of symptomatic remission. Notably, only 10% of participants reported no significant stressors in the preceding year, highlighting the pervasive nature of life stress among this clinical population. The association between life stress and suicidal ideation has been well-documented. Stressful life events are recognised as precipitating factors for suicidal behaviour, particularly in individuals with preexisting mental illness [22]. In schizophrenia, stress has

been shown to exacerbate cognitive distortions and emotional dysregulation, both of which contribute to suicidal thinking [19,27]. The findings reinforce this hypothesis: patients with a higher number of life event stressors had significantly elevated BSS scores. Specifically, mean scores increased from 6.8 in those with 1-3 stressors to 13.2 in those with more than 5, a difference that was statistically significant. This dose-response relationship between stressor burden and suicidal ideation is consistent with diathesis-stress models of suicide risk [28], which posit that environmental stressors interact with individual vulnerabilities (e.g., psychiatric illness, poor coping mechanisms) to increase the likelihood of suicidal behaviour [29]. The moderate positive correlation observed in this study ( $r=0.482$ ) supports this conceptual framework. Furthermore, the regression model ( $R^2=0.232$ ) indicates that approximately 23% of the variance in suicidal ideation scores could be explained by life event stress levels, emphasising the clinical relevance of psychosocial stress assessment in schizophrenia care.

A similar study done by Norman RM et al., also supports the role of interpersonal conflicts- such as marital disputes and family tensions- as high-impact stressors in individuals with schizophrenia [30]. These stressors are particularly potent because they often disrupt primary support systems and may contribute to feelings of hopelessness, social isolation, and perceived burdensomeness- key cognitive-affective states associated with suicide risk [31]. Financial difficulties and work-related problems, can threaten personal autonomy and self-worth, especially in a population already vulnerable to stigma and functional impairments [32].

The clinical implications of these findings are clear. Even during periods of symptomatic remission, patients with schizophrenia remain vulnerable to the psychological effects of life stressors. Routine assessment of psychosocial stress- particularly cumulative life events- should be integrated into outpatient care protocols. In addition, interventions focussed on enhancing coping strategies, strengthening social support, and addressing interpersonal conflicts may be effective in reducing suicide risk in this population.

### Limitation(s)

The present study has several limitations that should be acknowledged. First, its cross-sectional design limits the ability to establish causal relationships between life event stressors and suicidal ideation; longitudinal studies are needed to explore temporal dynamics. The use of non-probability purposive sampling may introduce selection bias and limit the generalisability of findings beyond the specific outpatient population studied. Self-reported measures of life stress and suicidal ideation, although validated, are subject to response bias, including underreporting due to stigma or recall inaccuracies. Additionally, the study did not control for potential confounding variables such as depressive symptoms, insight into illness, or medication adherence, which are known to influence suicidal behaviour in schizophrenia. The exclusion of patients with co-morbid psychiatric or substance use disorders, while necessary for internal validity, may further limit the applicability of results to the broader schizophrenia population frequently affected by such co-morbidities.

### CONCLUSION(S)

In conclusion, the present study highlights a significant association between the number of life event stressors and the severity of suicidal ideation in patients with schizophrenia during remission. A significant, moderate positive correlation between the PSLES scores and suicidal ideation was also observed. While demographic and clinical variables did not show significant associations with suicidal ideation, higher levels of cumulative life stress were clearly linked to increased suicidal risk. These findings underscore the importance of routine psychosocial stress assessment and targeted interventions

aimed at stress management to reduce suicidality in this vulnerable population. In future, interventions focused on enhancing coping strategies, strengthening social support, and addressing interpersonal conflicts may be effective in reducing suicide risk in this population. Further studies are required and to be done with larger sample size and involving multiple centers for generalisability.

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