# The Prevalence of Depressive Symptoms in Schizophrenia: A Cross-Sectional Study

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**Abstract**. Schizophrenia is a disorder with a highly heterogeneous clinical picture. Depressive symptoms occur in schizophrenia, and they increase the disease burden and distress. There are very few studies on this topic in India. This study aims to estimate the prevalence of depressive symptoms in schizophrenia and its correlation with socio-demographic factors as well as symptom domains such as positive, negative and general psychopathology. This cross-sectional study was conducted in a tertiary care hospital with consecutive sampling. Persons diagnosed with schizophrenia were administered a semi-structured proforma to collect socio-demographic data. Positive and Negative Symptom Scale (PANSS) was administered to assess symptom domains, and The Calgary Depression Scale for schizophrenia (CDSS) was used to measure depressive symptoms. The cut-off score to determine clinically significant depression was fixed at a score >7.

This study found that 28.6 % of persons with schizophrenia had clinically significant depression. It was found that there were no significant differences in age, education, marital status, residence, occupation, or socio-economic class between the depressed and non-depressed groups. 40% of the depressed patients had a positive history of previous suicide attempts, while in the non-depressed group, only 14% had a positive history of prior suicide attempts. In this study, the psychopathology of schizophrenia measured by the PANSS positive scale, negative scale, general psychopathology scale, and the PANSS total score did not have any statistically significant correlation with the depressive symptoms assessed by the Calgary depression scale for schizophrenia. The multidimensional model of schizophrenia gives a valid explanation for the absence of any correlation between depressive symptoms and other psychopathological entities. The clinically significant depression in schizophrenia is probably an independent component rather than a consequence of the psychotic symptomatology. The depressive symptoms should be addressed while treating schizophrenia, and appropriate therapeutic interventions are required to decrease the disease burden and improve the quality of life.

**Keywords**: Depression; Schizophrenia; Scale for depression; CDSS; PANSS.

## INTRODUCTION

Schizophrenia is a disorder with a highly heterogeneous clinical picture. The symptoms can show considerable changes over some time, and there is overlap between different symptom sets. The understanding of the clinical picture, boundary, and etiology of schizophrenia is further complicated by substantial psychiatric co-morbidity. Cross-sectional and longitudinal analysis of schizophrenic symptoms has led to the conceptualization of two replicable psychopathological domains of symptoms, positive and negative symptoms.

Authors [1] further elaborated on the syndromal concept of schizophrenia by contributing definitive psychopathological descriptions of two domains. It was found that a more fruitful approach would be to consider positive and negative syndromes as representing different psychopathological dimensions rather than co-exclusive subtypes of schizophrenia. More recently, it has become clear that the traditional positive-negative distinction of schizophrenia phenomenology is incomplete and must be enlarged to include other syndromal domains, such as cognitive and affective symptoms. This resulted in several expanded syndromal models of schizophrenia. They range from two-dimensional models to five-dimensional models [2-5]. The dimensional approach has significant advantages over the categorical approach in diagnosing, explaining the pathophysiology, and treating schizophrenia. It is improbable that schizophrenia is caused by a single neurotransmitter or pathophysiological abnormality, which in turn may be associated with one or more liability genes. This approach also has the advantage of accommodating the apparent continuity of some clinical manifestations seen in the disorders represented in the schizophrenia spectrum concept. The syndromal approach further allows for evaluating treatment intervention on each psychopathological domain separately and to define co-morbidity phenomena more appropriately. The most frequently encountered co-morbidities are substance use, anxiety, and depression. The co-morbidities may result from the disease process or secondary to drug therapy. For example, affective symptoms may occur as a part of the disease or may be secondary to external factors such as environment, extrapyramidal symptoms due to antipsychotic medications, and psychological reactions after recovery from an acute episode.

To some extent, the co-occurrence of additional symptoms influences the treatment strategies, relapse, and long-term outcome of the disorder. Nosologists had difficulty dealing with heterogeneous sets of symptoms. Studies were directed to determine the possible correlation between different symptoms. The symptom sets were either considered as a part of complex syndrome schizophrenia, and when no importance could be determined, nosologists resorted to labelling them as "schizoaffective disorder". An alternative approach was adopted by the Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV-TR, which is to consider the accompanying symptoms as a part of another diagnosis under axis I along with schizophrenia. In this scenario, the patient has two major co-occurring disorders. The author [6] postulated that psychiatric co-morbidities are so common that they may be an integral part of schizophrenia.

From the time of Bleuler, affective symptoms were recognized as a part of schizophrenia. Depressive symptoms are common in schizophrenia. These symptoms increase the disease burden and distress. The depressive symptoms affect well-being and cause poorer outcomes in the long run. These symptoms should be addressed while treating schizophrenia, and appropriate therapeutic interventions are required to decrease the burden of the disease and increase the quality of life. The understanding of the frequency of co-occurrence of depressive symptoms and their correlation with other clinical factors is warranted to manage the illness effectively. This study aims to bridge the gap in the literature as prevalence studies are scarce in India, especially in South India.

## MATERIALS AND METHODS

This is a cross-sectional study conducted in the psychiatry outpatient department of Stanley Medical College Hospital, Chennai. All consecutive patients with a diagnosis of schizophrenia as per the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) who met the inclusion and exclusion criteria during the study period were included. A total sample of 70 patients was obtained. Consenting patients of both genders diagnosed with schizophrenia aged 18 to 50 years who were capable of tolerating lengthy interviews.

Patients with a diagnosis of schizoaffective disorder, any chronic general medical illness, or on medication for any other disease, including organic syndromes and aggressive, agitated patients, were excluded. A semi-structured questionnaire was administered to collect the socio-demographic details and clinical history. Positive and Negative Symptoms Scale (PANSS) was administered to evaluate the illness severity and symptom domains [7]. Calgary Depression Scale for Schizophrenia (CDSS) was used to assess depressive symptoms.

Socio-demographic variables like age, sex, domicile, marital status, education, occupation, and socio-economic class were studied, and clinical variables like family history of mental illness, previous history of hospitalization, and history of suicide attempt were included in the questionnaire. Statistical analysis used the SPSS program version 20. The chi-square test was applied to test the association between the available variables. The correlation of scores was tested using the Pearson correlation coefficient. A p-value of <0.05 was considered statistically significant.

## RESULTS AND DISCUSSION

A total of 70 patients were evaluated. Among the 70 participants, 40 were male and 30 were female. Forty-eight of the participants hailed from urban areas. Fifty-two of the participants belong to the age group 31-40 years of age. Thirty participants were unemployed, while 32 were unmarried.

The prevalence of depression was estimated to be 28.6%. There was no statistically significant difference in age, education, marital status, residence, occupation, or socio-economic class between the depressed and non-depressed groups.

Previous hospitalization was observed among 55% of those with clinically significant depressive symptoms, while a family history of psychiatric illness was present among 30% of the depressed individuals. However, there was no significant correlation between the clinical variable and depressive symptoms. The previous history of suicide attempts was observed among 8 (40%) of individuals with clinical depression and was statistically significant as the p-value was 0.017).

Table 1 – Socio-demographic factors and their correlation with depressive symptoms

| Socio-demographic factors | Categories | Frequency | Clinically significant depression | No clinically significant depression | p-value |
|---|---|---|---|---|---|
| Age in Years | <20 | 4 | 0 (0.0%) | 4 (8%) | 0.107 |
| | 21-30 | 26 | 9 (45%) | 17 (34%) | |
| | 31-40 | 26 | 6 (30.0%) | 20 (40%) | |
| | 41-50 | 14 | 5 (25%) | 9 (18%) | |
| Gender | Male | 40 | 11 (55%) | 29 (58%) | 0.204 |
| | Female | 30 | 9 (45%) | 21 (42%) | |
| Residence | Urban | 48 | 11 (55%) | 37 (74.0%) | 0.082 |
| | Semi-urban | 12 | 6 (30.0%) | 6 (12.0%) | |
| | Rural | 10 | 3 (15.0%) | 7 (14.0%) | |
| Education | Illiterate | 6 | 1 (5%) | 5 (10.0%) | 0.064 |
| | Primary | 14 | 5 (25%) | 9 (18.0%) | |
| | Middle School | 11 | 4 (20.0%) | 7 (14.0%) | |
| | High School | 16 | 2 (10.0%) | 14 (28.0%) | |
| | Higher Secondary | 15 | 5 (25.0%) | 10 (20.0%) | |
| | Graduate | 6 | 2 (10.0%) | 4 (8.0%) | |
| | Professional | 2 | 1 (5.0%) | 1 (2.0%) | |
| Occupation | Unemployed | 30 | 21 (42.0%) | 9 (45.0%) | 0.063 |
| | Unskilled | 13 | 8 (16.0%) | 5 (25.0%) | |
| | Semi-skilled | 16 | 12 (24.0%) | 4 (20.0%) | |
| | Clerical work | 9 | 7 (14.0%) | 2 (10.0%) | |
| | Professional | 2 | 2 (4.0%) | 0 (0.0%) | |

Notes: p-value less than 0.05 is statistically significant.

Table 2 – Clinical correlates and their relationship to depression

| Clinical factors | Present/Absent | Clinically significant depression is present | No Clinically significant Depression | p-value |
|---|---|---|---|---|
| Previous hospitalization | Present | 11 (55.0%) | 27 (54.0%) | 0.940 |
| | Absent | 09 (45.0%) | 23 (46.0%) | |
| Previous suicide attempt | Present | 8 (40%) | 7 (14%) | 0.017* |
| | Absent | 12 (60%) | 43 (86%) | |
| Family history of mental illness | Present | 6 (30.0%) | 23 (46.0%) | 0.220 |
| | Absent | 14 (70.0%) | 27 (54.0%) | |

Notes: * p-value less than 0.05 is significant.

The symptom domains of schizophrenia were evaluated using PANSS. The positive scale of PANSS had a mean of 14.07, the negative scale had a mean of 14.90, and the general psychopathology scale had a mean of 25.89. The total PANSS score had a mean score of 54.76. The Calgary Depression Scale had a mean of 5.33 with a standard deviation of 6.399.

Table 3 – Calgary Depression Scale and PANSS scores

| | CDSS SCORE | PANSS | | | |
|---|---|---|---|---|---|
| | | Positive | Negative | General | Total |
| Mean | 5.33 | 14.07 | 14.90 | 25.89 | 54.76 |
| Std. Deviation | 6.399 | 4.489 | 5.336 | 5.487 | 8.960 |

Notes: CDSS – Calgary Depression Scale for Schizophrenia; PANSS – Positive and Negative Symptom Scale

Among the 70 patients, 48 (68.60%) patients had some depressive symptoms, while 28.6% of schizophrenia patients had clinically significant depression. There was no statistically significant correlation between PANSS scores and CDSS scores.

Table 4 – Correlation between Positive and Negative Symptom Scale (PANSS) and Calgary Depression Scale for Schizophrenia (CDSS)

| Correlation between PANSS and CDSS | | CDSS SCORES |
|---|---|---|
| PANSS Positive | Pearson Correlation r | -.048 |
| | Sig. (2-tailed) p | .695 |
| | N | 70 |
| PANSS Negative | Pearson Correlation r | .115 |
| | Sig. (2-tailed) p | .342 |
| | N | 70 |
| PANSS General Psychopathology | Pearson Correlation r | -.122 |
| | Sig. (2-tailed) p | .313 |
| | N | 70 |
| PANSS Total | Pearson Correlation r | -.025 |
| | Sig. (2-tailed) p | .838 |
| | N | 70 |

Notes: CDSS – Calgary Depression Scale for Schizophrenia, PANSS – Positive and Negative Symptom Scale.

Many researchers have calculated the prevalence of depressive symptoms in schizophrenia, and the results ranged from a minimum of 6% to a maximum of 80% [8-14]. The reported rates were highly variable due to the various instruments used to measure depression. In this study, the Calgary depression scale for schizophrenia was used, which is highly sensitive in detecting depressive symptoms in schizophrenia. The depressive symptoms were present in 68.60% (48 out of 70) of patients, but a score of less than seven on the Calgary depression scale was considered insignificant. It was found that 28.6 % (20 out of 70) of patients had clinically significant depression. The cut-off score to determine clinically considerable depression was fixed at a score > 7, as recommended by [15]. The score of > 7 had a sensitivity of 91% and specificity of 85% in detecting depressive symptoms.

The socio-demographic parameters were compared between the depressed group and the non-depressed group. Conventionally, the female sex was considered as a predisposition for the development of depressive symptoms. Still, no sex difference was observed in the development of depressive symptoms in this study in corroboration with the findings of other researchers [16, 17].

30% of female patients (N=30) with schizophrenia were depressed, while only 27.5% of male patients (N=40) were depressed, but the difference was not statistically significant as the p-value was > 0.05.

The relationship between the positive, negative, general psychopathology symptoms and depressive symptoms appears to vary with the course of the illness. Researchers reported mixed results regarding the correlation between the symptoms of schizophrenia and depressive symptoms. In this study, the psychopathology of schizophrenia measured by the PANSS positive scale, negative scale, general psychopathology scale, and the PANSS total score did not have any statistically significant correlation with the depressive symptoms assessed by the Calgary depression scale for schizophrenia in line with findings of other researchers [16,18,19]

There may be a suspicion that the observed depressive symptoms are secondary to the neuroleptic medications. Still, recent studies suggested that there was an overall improvement in all components of schizophrenia, including depressive symptoms, with the administration of neuroleptic medication [20]. Further, the Calgary depression scale is found to be effective in measuring subjective depressive symptoms rather than observed signs, which might be misleading in the background of antipsychotic intake.

There are some limitations to this study. This study was conducted in a tertiary care centre, so the findings cannot be generalized. A consecutive sampling method was used, and the sample size was small. The study was cross-sectional, and results may vary with the course of the illness. The pharmacological management adopted and its clinical variables were not studied.

## CONCLUSIONS

The prevalence of depressive symptoms among schizophrenia patients was found to be 28.6%. The history of suicide attempts is a valuable indicator in predicting depressive symptoms in schizophrenia, as demonstrated by the significant positive history of suicide attempts among depressed patients. The positive, negative, and general psychopathology scores measured by PANSS did not correlate with the depressive symptoms.

The multidimensional model of schizophrenia gives a valid explanation for the absence of any correlation between depressive symptoms and other psychopathological entities. The feasible explanation would be that the depressive symptoms are not part of the positive or negative symptoms but, by itself, a core component of the illness. The clinically significant depression in schizophrenia is probably an independent component rather than a consequence of the psychotic symptomatology. It is essential to look for depressive symptoms while treating schizophrenia to decrease the disease burden and improve the quality of life.

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