Research Report

PROPORTION OF PSYCHOTIC FEATURES IN PERSONS WITH MAJOR DEPRESSION AND THEIR RELATIONSHIP WITH DEPRESSION SEVERITY: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Psychotic features like delusions and hallucinations occur in a clinically meaningful subset of depressive episodes. While Western estimates place the prevalence of psychosis in depression at 15–30%, Indian data are limited. ICD-10 ties psychosis to severe depression, whereas DSM-5 decouples psychosis from severity, and ICD-11 introduces moderate depression with psychotic features. Contemporary, India-specific evidence is needed to inform classification and care. **Methods:** This cross-sectional study at a tertiary care center evaluated 170 consecutive adult persons with depression (including major depressive episodes in bipolar I/II) who were diagnosed per DSM-5 using SCID-5. Depression and psychosis severity were assessed with the Hamilton Depression Rating Scale (HAM-D) and the Brief Psychiatric Rating Scale (BPRS), respectively. The data was analyzed using ANOVA, chi-square test, and Pearson correlation. **Results:** Overall, 24.7% (42/170) had psychotic features. Prevalence rose with depression severity: 0% in mild, 8.6% (7/81) in moderate, and 47.9% (35/73) in severe depression, which was significant. (p=0.01) Mean BPRS scores increased across severity strata with significant between-group differences. (F=55.79, p<0.01). HAM-D scores correlated positively with BPRS scores (ρ= 0.77, p<0.001), indicating that higher depressive severity was associated with greater psychosis severity. **Conclusion:** Psychotic features occur in approximately one-quarter of persons with major depression and are not confined to severe episodes, with a notable proportion present in moderate depression. The graded increase in both prevalence and severity of psychosis with depressive severity supports DSM-5's delinking and aligns with ICD-11's category of moderate depression with psychotic features. These findings underscore the need for routine psychosis screening across all depression severities.

Keywords: Depression, Severity of Depression, Psychotic Symptoms, ICD-11, DSM-5

INTRODUCTION

Depressive disorders are highly prevalent, affecting approximately one in five women and one in ten men over a lifetime, with bipolar disorder accounting for a substantial proportion of depressive episodes. Beyond these core symptoms like persistent low mood, anhedonia, and fatigue, major depression is associated with psychotic features such as delusions and hallucinations. [1]Nosological systems have differed in how they relate psychosis to depressive severity. Under ICD-10, the presence of psychotic features automatically classified an episode as severe.[1] In contrast, DSM-5 decouples psychosis from severity ratings, permitting specifiers for psychotic features across severity levels. [3] Reflecting evolving evidence, ICD-11 now includes a category of moderate depression with psychotic features.[4] Despite these changes, empirical data directly examining how psychotic

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features distribute across depression severity strata remain limited, particularly in low- and middle-income settings.

Studies suggest that 15–30% of individuals with depression in high-income settings may exhibit psychotic features.[5] Indian data are scarce; a seminal study from 1989 reported delusions in 18% of depressed patients.[6] This study, conducted at a tertiary care center in South India, aims to address the gaps by estimating the proportion of psychotic features among patients with major depression and examining the association between depression severity category and the presence of psychotic features. The study also aims to evaluate the relationship between continuous measures of depression severity and psychosis severity. By aligning analyses with current nosological frameworks (DSM-5 and ICD-11), the study provides timely evidence to contextualize the placement of psychotic features across severity levels in an Indian clinical population.

MATERIALS AND METHODS

This cross-sectional study was conducted in the Department of Psychiatry at the Government Medical College, Kozhikode, from March 2022 to November 2022. Participants were recruited from the outpatient department, inpatient wards (including admissions from the emergency department), and transfers from other hospital departments. Based on an Indian study reporting 18% prevalence of delusions in depression,[6] the required sample was estimated using the formula N = 4PQ/d^2, with P = 18, Q = 82, and absolute precision d = 6. The calculated N was 164; allowing for rounding and potential attrition, a final target of 170 participants was set. The Institutional Ethics Committee approval was obtained prior to study initiation. All participants provided written informed consent and were assured of confidentiality and the voluntary nature of participation, with no impact on their clinical care.

Consecutive adults aged 18 years and above who provided written informed consent were screened. Diagnostic ascertainment was performed using the Structured Clinical Interview for DSM-5 (SCID-5) and reviewed with a consultant psychiatrist.[7] Eligible cases met DSM-5 criteria for either major depressive disorder or a major depressive episode within bipolar I or II disorder. Exclusion criteria were current substance use disorder other than nicotine, severe physical illness that interfered with interview procedures, and significant cognitive impairment. Although structured assessment tools were not used to conduct a cognitive assessment, all subjects underwent a detailed mental status examination and system examination, including a central nervous system examination that covers cognitive elements such as attention, concentration, and memory, among others. Any level of impairment that prevented the patient from aptly understanding or responding to the assessment tool questions was considered significant, and hence, they were excluded from the study sample. Recruitment continued until the target sample size was achieved.

A sociodemographic and clinical proforma captured age, sex, education, marital and employment status, and illness characteristics (e.g., duration). DSM-5 diagnoses were established with SCID-5 and confirmed by a consultant psychiatrist.[3] The Hamilton Depression Rating Scale (HAM-D) was used to quantify depressive symptom severity.[8] The Brief Psychiatric Rating Scale (BPRS) was used to

assess the presence and severity of psychotic symptoms, including delusional phenomena (e.g., referential, persecutory, guilt).[9]

After eligibility screening and consent, trained clinicians administered the SCID-5, HAM-D, and BPRS in a single assessment session. All assessments were conducted in a standardized order to minimize measurement bias. Data were recorded on standardized case report forms and subsequently entered into a secure database with quality checks for completeness and internal consistency.

Descriptive statistics summarized sociodemographic and clinical variables. Group differences in BPRS across depression-severity categories were tested using one-way ANOVA. Associations between categorical variables (e.g., presence of psychotic features across severity strata) were examined using chi-square/ Fisher exact tests. Pearson correlation (two-tailed) was used to assess the linear relationship between HAM-D and BPRS scores. Analyses were performed using SPSS (version 20).

RESULTS

We enrolled 170 participants (age range 19–88 years; mean 47, SD 13), with the plurality clustered between 30 and 50 years. Educational attainment was predominantly primary school (71.2%), followed by higher secondary (17.6%), degree (7.6%), diploma (1.8%), and professional degree (1.8%). The sample comprised 62 males (36.5%) and 108 females (63.5%). Most participants were married (87.6%), with 8.8% single, 2.4% widowed, and 1.2% widower. Regarding employment, 67% were unemployed (predominantly homemakers), 27% engaged in unskilled work, and 5.2% held skilled jobs. Clinically, depression severity was mild in 16 (9.4%), moderate in 81 (47.6%), and severe in 73 (42.9%). The duration of illness was less than 6 months in 143 participants (with a minimum of 2 weeks) and more than 6 months in 27 (with a maximum of 5 years). The socio-demographic variables are summarized below. (Table 1)

Table 1: Distribution of Socio-demographic Variables

Variables	Categories	n (%)
Gender	Male	62(36.5)
	Female	108(63.5)
Education	Primary	121(71.2)
	Higher secondary	30(17.6)
	Diploma	3(1.8)
	Degree	13(7.6)
	Professional	3(1.8)
Marital status	Married	149(87.6)
	Single	15(8.8)
	Widow	4(2.4)
	Widower	2(1.2)
Occupation	Unemployed	114(67)
	Unskilled job	47(27.6)
	Skilled job	9(5.29)

Psychotic features were identified in 42 of 170 participants (24.7%). By sex, 12 of 62 males (19.4%) and 30 of 108 females (27.8%) had psychotic symptoms. (Table2) Psychosis prevalence increased with depression severity: 0 of 16 (0%) with mild depression, 7 of 81 (8.6%) with moderate depression, and 35 of 73 (47.9%) with severe depression; the association across severity groups was statistically significant ($p<0.01$). Mean BPRS scores differed significantly by depression severity on ANOVA ($p<0.01$),

indicating progressively greater psychosis severity from mild to severe depression. (Table 3) Consistent with this gradient, there was a significant positive correlation between depressive symptom severity (HAM-D) and psychosis severity (BPRS) on two-tailed Pearson analysis (ρ= 0.77, p<0.001), supporting a dimensional relationship between depressive and psychotic symptom burden.

Table 2: Distribution of Clinical Variables

Variables	Categories	n (%)
Depression	Mild	16(9.4)
	Moderate	81(47.6)
	Severe	73(42.9)
Psychotic feature	Present	42(24.7)
	Absent	128(75.3)
Gender and Psychotic Features	Male (n=62)	12(19.30
	Female (n=108)	30(27.7)

Table 3: Association of BPRS with HAM-D

	Mild (mean± SD)	**Moderate (mean± SD)**	**Severe (mean± SD)**	**F-value**	**P-value**
BPRS	19.43± 2.80	28.12± 8.95	47.69± 17.67	55.79	<0.001

Analyses of psychotic symptom subtypes showed that manifestations were concentrated among those with severe depression. Referential delusions were the most common, followed by persecutory delusions and delusions of guilt and infidelity. Subtype-specific contrasts demonstrated significant severity-related associations: for persecutory delusions, 11 of 73 severe cases (15.1%) were affected (p<0.01), whereas no cases were observed in mild or moderate groups; for referential delusion, 12 of 73 severe cases (16.4%) and 4 of 81 moderately severe cases (4.9%) were positive (p<0.05), and for delusions of guilt., 6 of 73 severe cases (8.2%) were positive (p<0.01), with no cases in mild or moderate depression. Taken together, these findings show that while psychotic symptoms occur in approximately one quarter of patients with major depression overall, their prevalence and severity scale sharply with depressive severity, and specific delusional phenomena are largely confined to the severe subgroup. (Table 4)

Table 4: Association of Psychotic Symptoms with Severity of Depression

Symptom/Feature	Mild (n, %)	Moderate (n, %)	Severe (n, %)	Chi-square /Fisher exact	p-value
Psychosis	Yes: 0 (0) No: 16 (100)	Yes: 7 (8.6) No: 74 (91.4)	Yes: 35 (47.9) No: 38 (52.1)	33.32	<0.001
Referential Delusion	Yes: 0 (0) No: 16 (100)	Yes: 4 (4.9) No: 77 (95.1)	Yes: 12 (16.4) No: 61 (83.6)	6.73	0.03
Persecutory Delusion	Yes: 0 (0) No: 16 (100)	Yes: 0 (0) No: 81 (100)	Yes: 11 (15.1) No: 62 (84.9)	15.13	0.0005
Auditory Hallucination	Yes: 0 (0) No: 16 (100)	Yes: 0 (0) No: 81 (100)	Yes: 3 (4.1) No: 70 (95.9)	3.23	0.199
Delusion of Guilt	Yes: 0 (0) No: 16 (100)	Yes: 0 (0) No: 81 (100)	Yes: 6 (8.2) No: 67 (91.8)	7.15	0.028

Nihilistic Delusion	Yes: 0 (0) No: 16 (100)	Yes: 0 (0) No: 81 (100)	Yes: 3 (4.1) No: 70 (95.9)	3.23	0.20
Infidelity Delusion	Yes: 0 (0) No: 16 (100)	Yes: 2 (2.5) No: 79 (97.5)	Yes: 2 (2.7) No: 71 (97.3)	0.29	0.865

DISCUSSION

One of the primary objectives of the study was to elucidate the relationship between the severity of depression and the intensity of psychotic features, as evaluated by the HAM-D and the BPRS scores. The study revealed a significant positive correlation between the severity of depression, quantified as a continuous variable through the HAM-D, and the intensity of psychosis, assessed as a continuous variable via the BPRS score. This indicates that the intensity of depressive symptoms and the severity of psychotic symptoms are interrelated and possibly along a continuum. This suggests that the more pronounced the depression, the greater the propensity for the emergence of psychotic features. This continuum of depressive severity is traditionally categorized into three distinct levels: mild, moderate, and severe. The continuum of psychosis may be clinically identified as a definitive psychotic symptom when it surpasses a certain threshold, as determined by a clinician's judgment, which can vary among different practitioners [10, 11]

The study revealed that the prevalence of psychotic features (24.7%) observed within the entire cohort of 170 patients is commensurate with the findings of the Indian study, which reported a prevalence of psychotic features at 18% in a general hospital setting.[6] The modest increase in the percentage observed in this study may be attributable to the context of it being a referral center. The current research revealed that 47.9% of patients exhibiting severe depression presented with psychotic features, a finding that aligns with the range reported in prior studies.[5] Notably, 8.6% of patients exhibiting moderate depression presented with psychotic features. This finding bolsters the rationale for the revised diagnostic classification in ICD-11, which has introduced the novel category of moderate depression with psychotic features. It is also consistent with the DSM-5, which has decoupled the severity of depression from the presence of psychotic features. Consequently, a diagnosis of moderate depression accompanied by psychotic features can be rendered under the DSM-5 framework. Such a diagnosis, however, is unattainable under the ICD-10, potentially presenting an incongruity for clinicians who have been extensively trained and have practiced using the ICD-10 criteria for a considerable duration.

Mechanistically, the intricate interplay between depressive and psychotic symptomatology may elucidate shared neurobiological substrates (e.g., dysregulated fronto-limbic circuits, stress–inflammation pathways), [12-14] cognitive-affective vulnerabilities (e.g., negative schema amplification manifesting as delusional content), [16] and the ramifications of illness chronicity and severity that exacerbate the risk of psychosis. The prevalence of delusional themes frequently observed in depressive psychosis (e.g., referential, persecution, guilt) aligns with established phenomenological frameworks, and their emergence predominantly in more severe cases likely correlates with an overall

psychopathological burden and compromised reality testing. [13-16]

The study has its limitations. The influence of the medications on patients who were already undergoing treatment was not thoroughly analyzed. Selecting exclusively drug-naïve patients would have constituted a more optimal study design. However, due to the ongoing COVID pandemic and the overall decline in patient attendance at the department, it became impractical to assemble such a cohort with a sufficiently robust sample size. The pandemic period also complicated the acquisition of a homogeneous study sample, further constraining the robustness of the findings. Moreover, the apprehension surrounding COVID may have dissuaded individuals with milder symptoms from seeking medical assistance. The elevated prevalence of psychosis among individuals from lower socio-economic backgrounds may have further biased the study findings, given that the hospital primarily catered to a considerable number of daily wage earners. Additionally, it was not feasible to include distinct sections or conduct independent analyses on subsets of unipolar depression, bipolar I, and bipolar II disorders, owing to the insufficient samples in the latter two categories. Ultimately, patients grappling with depression often face difficulties in articulating their symptoms accurately, which may have further impacted the results of the study.

In prospective research, drug-naive patients may be recruited for the study. An expanded sample size and a multicentric design will illuminate the prevailing trends concerning the interplay between psychotic features and the severity of depression within the Indian context. The trajectory of psychotic symptoms, concomitant manifestations, and phenomenology has not been comprehensively explored in an Indian setting previously. A study that selects a cohort of patients exhibiting psychotic symptoms to examine the severity of their depressive episodes could yield significant insights. Additionally, further investigations into the patterns of moderate depression accompanied by psychotic features, along with more extensive studies examining the implications of the ICD-11 classification, may assist clinicians in diagnosing moderate depression in patients presenting with psychotic features with greater clarity and reduced hesitation.

CONCLUSION

This study showed that psychotic features were common in major depression, particularly in severe cases, and were present even in moderate depression, aligning with ICD-11's inclusion of moderate depression with psychotic features and supporting DSM-5's decoupling of depression severity from psychosis. Referential delusions predominated, followed by persecutory and guilt delusions. Psychosis severity increased across mild-to-severe categories and showed a positive linear association with depression severity, reinforcing a continuum model in which depressive and psychotic dimensions are interrelated. These findings underscore the need for routine assessment of psychotic symptoms across all depression severities and may inform classification and treatment planning.

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