

# Characteristics of mood-congruent and mood-incongruent psychotic features in bipolar disorder

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## Abstract

**Introduction:** Psychotic features in patients with bipolar disorder (BD) have been poorly researched in the context of their relationship with the longitudinal course and demographic and clinical characteristics of the illness.

**Material and methods:** In a cross-sectional study of BD patients, comprehensive demographic and clinical characteristics were assessed using the Structured Clinical Instrument for DSM-IV-TR (SCID). Manic symptoms were assessed using Young's Mania Rating Scale (YMRS), depressive symptoms by the Montgomery-Åsberg Depression Rating Scale (MADRS) and psychotic symptoms with the Scale for Assessment of Positive Symptoms (SAPS). The relationships between these characteristics and psychotic symptoms were analysed. The independent samples *t*-test was used to assess continuous variables, while the  $\chi^2$  test was used to assess categorical data.

**Results:** Psychotic features were associated with BD in 48.94% of patients ( $n = 92$  out of a total of 188 patients having BD). Of these, 45.74% ( $n = 86$ ) had mood-congruent psychotic features and 3.19% ( $n = 6$ ) had mood-incongruent psychotic features. All six patients who had mood-incongruent psychotic features had manic symptoms.

**Conclusions:** Our findings suggest that mood-congruent psychotic symptoms in BD are associated with a more severe, predominantly manic illness course. Mean age at onset was 27.76 ( $\pm 8.54$ ) years for patients with mood-congruent psychotic features and 28.00 ( $\pm 11.08$ ) years for patients with mood-incongruent psychotic features.

**Key words:** bipolar disorder, mood congruence, mood incongruence, psychotic features.

## Introduction

Presence of any psychotic symptoms and illness is commonly mistaken for schizophrenia. Such a belief is often associated with chronic psychotic symptoms and poor psychosocial outcome. Psychosis is a commonly prevalent phenotype in bipolar disorder (BD), with more than half of all the individuals diagnosed with BD experiencing psychotic mood episodes in their lifetime (Dunayevich and Keck 2000). In some studies it has been found that psychotic symptoms or psychosis reported in acute mood episodes of BD (mania, depression and mixed states) is nearly equivalent to psychotic symptoms observed in schizophrenia (SCZ) (Pini *et al.* 2004; Keck *et al.* 2003). Nearly half of bipolar patients have

a lifetime history of psychotic symptoms (Keck *et al.* 2003; Ozyildirim *et al.* 2010; Dell'Osso *et al.* 2017; Altamura *et al.* 2019). Indeed, across all jurisdictions, individuals with a diagnosis of BD make up a sizeable proportion of hospital admissions following a psychotic episode (Kirkbride *et al.* 2017; Simon *et al.* 2017). Psychotic symptomatology in bipolar mood disorder was dichotomized into mood-congruent and mood-incongruent delusions for the first time in DSM IV (APA, 2000). However, what do the terms 'mood-congruent' and 'mood-incongruent' mean? How do we differentiate the relationship between the content of delusional thoughts and an individual's mood? What justifies such estimation? Although the differentiation between mood-congruent and mood-incongruent delu-

sions is now a common practice, the concept of mood congruence is sometimes criticized by researchers as being ambiguous (Maj 2008).

Lifetime prevalence of psychotic features in BD is associated with unfavourable socio-demographics and severity of clinical features as well as with a more frequent initial misdiagnosis of the disorder (Dell'Osso *et al.* 2017; Altamura *et al.* 2019). The lifetime presence of psychotic features in BD was found to be associated with more severe clinical features, including early age of onset, more substance abuse and social dysfunction as compared to non-psychotic features (Coryell *et al.* 2001; Kessing 2004; Dell'Osso *et al.* 2017).

The debate on the overlap of psychotic symptomatology in schizophrenia and BD from the perspective that these disorders may pose a diagnostic continuum with shared aetiology is ongoing (van Os and Reininghaus 2016). Some argue that the psychosis continuum extends from BD to schizoaffective disorder and at the other end typical schizophrenia, and reflects increasing severity (van Os *et al.* 2000; Craddock *et al.* 2005; The International Schizophrenia Consortium 2009).

Mood-congruent psychotic (MCP) symptoms including delusions and hallucinations that are consistent with manic/depressive episodes by their varied content of inflated self-esteem, power, identity, or special relationship with a famous person (APA 1994). Mood-incongruent psychotic (MIP) symptoms include persecutory thoughts unrelated to manic themes, such as persecutory delusions not directly related to grandiose themes, thought insertion, and delusions of being controlled (APA 1994). Schneiderian first-rank symptoms (Hales *et al.* 1994) are also considered to be mood incongruent in bipolar disorders (APA 1994).

Clarification of whether BD with psychotic features indeed reflects a greater degree of severity is an important inquiry in terms of nosology and treatment. As the field of psychiatry moves toward dimensional symptoms and functional descriptions rather than categorical classification, it will be helpful to have a better understanding of what features characterizes 'bipolar-spectrum' or 'psychotic-spectrum' illnesses and whether they require different targets for intervention. Recognizing similarities and differences between BD with and without psychotic features is also important for diagnostic classification and prognostic value. This knowledge may guide and aid treatment providers in clinical decision-making; if the presence of psychotic features is associated with poorer functioning, it might be necessary

to target psychotic symptoms separately or more aggressively than mood symptoms. To address such queries, this study focuses on investigating the phenomenology of psychotic features, and demographic and clinical characteristics among an Indian population of participants with BD.

## Material and methods

### Study population

Inpatients from a psychiatry ward, diagnosed as having a bipolar mood disorder (manic/depressive/mixed) with psychotic features, admitted during a period of 1 year after approval of the Ethics Committee and in the age group between 18 and 65 years were included. Exclusion criteria: 1. Mood disorder secondary to medical or neurological illness; 2. Associated untreated medical condition, which can potentially cause development of psychotic features; e.g. untreated thyroid abnormalities or Cushing's syndrome (Santos *et al.* 2017); 3. Substance-induced mood disorder; 4. Pregnant patients.

### Methodology

After obtaining approval from the Ethics Committee, this study was conducted. After obtaining the informed consent, patients were required to fill in a semi-structured proforma consisting of socio-demographic and clinical (illness variables and phenomenology of symptoms) details.

### Clinical assessment

The diagnosis was established based on a clinical interview using the Structured Clinical Instrument for DSM-IV-TR (SCID) (First *et al.* 1997). Manic symptoms were assessed using Young's Mania Rating Scale (YMRS), depressive symptoms by the Montgomery-Åsberg Depression Rating Scale (MADRS) (Montgomery and Åsberg *et al.* 1979) and psychotic symptoms with the Scale for Assessment of Positive Symptoms (SAPS) (Andreasen 1984).

All data were collected in a single sitting and the average time to complete all the study related assessments by a patient was 50-60 minutes, approximately, but no fixed time limit was set. The assessments were administered by one group of researchers.

### Instruments used (scales)

Structured Clinical Instrument for DSM-IV-TR (SCID, First *et al.* 1997): The Structured

Clinical Interview for DSM-IV Axis I Disorders (SCID-I) is a diagnostic examination used to determine DSM-IV Axis I disorders (major mental disorders). The instrument was designed to be administered by a mental health professional, for example, a psychologist or psychiatrist. This must be someone who has relevant professional training and has had experience performing unstructured, open-ended question, diagnostic evaluations. However, for some research studies, non-clinician research assistants, who have extensive experience with the study population in question, and who have demonstrated competence, have been trained to use the SCID. The less clinical experience and specific education the potential interviewer has had, the more training is required.

The Young Mania Rating Scale (YMRS, Young *et al.* 1978) is one of the most frequently utilized rating scales to assess manic symptoms. The scale has 11 items and is based on the patient's subjective report of his or her clinical condition over the previous 48 hours. Additional information is based on clinical observations made during the clinical interview. The items are selected based on published descriptions of the core symptoms of mania. The YMRS follows the style with each item given a severity rating. Four items are graded on a 0 to 8 scale (irritability, speech, thought content, and disruptive/aggressive behaviour), while the remaining seven items are graded on a 0 to 4 scale. These four items are given twice the weight of the others to compensate for poor cooperation from severely ill patients. There are well-described anchor points for each grade of severity. The authors encourage the use of whole or half-point ratings once experience with the scale is acquired. Typical YMRS baseline scores can vary a lot. They depend on the patients' clinical features such as mania (YMRS = 12), depression (YMRS = 3), or euthymia (YMRS = 2). Sometimes a clinical study entry requirement of YMRS > 20 generates a mean YMRS baseline of about 30. Strengths of the YMRS include its brevity, widely accepted use, and ease of administration. The usefulness of the scale is limited in populations with diagnoses other than mania. The YMRS is a rating scale used to evaluate manic symptoms at baseline and over time in individuals with mania. The scale is generally done by a clinician or other trained rater with expertise with manic patients and takes 15-30 minutes to complete.

Montgomery-Åsberg Depression Rating Scale (MADRS): This instrument consists of nine questions where one can get from 0 to 6 points

(so theoretically can have between 0 and 54 points in total). The grading is based on a clinical interview moving from broadly worded questions about symptoms to more detailed questions that allow a precise assessment of severity. The interviewer must determine whether the assessment is on one of the defined steps on the scale (0, 2, 4, 6) or between them (1, 3, 5). The questionnaire includes questions on the following symptoms 1. Apparent sadness, 2. Reported sadness, 3. Inner tension, 4. Reduced sleep, 5. Reduced appetite, 6. Concentration difficulties, 7. Lassitude, 8. Inability to feel, 9. Pessimistic thoughts, 10. Suicidal thoughts.

Usual cut-off points are: 0 to 6 – normal/symptoms absent; 7 to 19 – mild depression; 20 to 34 – moderate depression; > 34 – severe depression.

Scale for the Assessment of Positive Symptoms (SAPS) has 30 items and provides coverage of hallucinations, delusions, and behavioural changes associated with psychosis and was developed for schizophrenia. Information is acquired from both the patient and an informant. Each SAPS item is scored on a 6-point Likert-type scale (0-5). The sum of the 4 global domains (hallucinations, delusions, bizarre behaviour, and formal thought disorder) produces a summary score of 0-20, and the sum of the 30 individual items provides a composite score of 0-150.

### Statistical analysis

Descriptive statistics were used to describe the data, frequencies and percentages for categorical variables and mean and SD for continuous variables. The independent samples *t*-test was used to assess continuous variables, while the  $\chi^2$  test was used to assess categorical data. These analyses were carried out using SPSS v. 20.0. Significance was set at  $p < 0.05$  (two-tailed).

### Results

This study included patients hospitalized for a manic, depressive or mixed episode of BD, who fulfilled the study inclusion criteria. From all the inpatients during 1 year, 212 patients were diagnosed as suffering from BD as per Diagnostic and Statistical Manual IV-TR (DSM-IV-TR). Amongst those diagnosed, 24 did not give consent, and hence were excluded from the study, while the remaining 188 patients were included in the study (the response rate being 88.6%). 92 patients out of our sample ( $n = 188$ ) were having psychotic features (48.94%) (mood-congruent/incongruent). 86 out of those

92 (93.47%) were diagnosed as having mood-congruent psychotic features and the remaining patients were diagnosed as having mood-incongruent psychotic features ( $n = 6$ ) (6.53%). Amongst the patients who had mood-congruent psychotic features, 68 (79.07%) were manic, 15 (17.44%) were depressed and 3 (3.49%) were having a mixed episode, as mentioned in Table 1.

The mean age for mood-congruent and mood-incongruent patients were respectively 35.22 ( $\pm 12.12$ ) years and 37.67 ( $\pm 11.86$ ) years. Amongst those with mood-congruent psychotic features, 51 (59.30%) were male and 35 (40.70%) were female. Amongst those with mood-incongruent psychotic features 5 (83.33%) were male and 1 (16.67%) was female. Mean education in years was 7.66 (4.43) and 5.50 (4.59) respectively for mood-congruent and mood-incongruent psychotic features. 76.64% ( $n = 66$ ) of Hindus, 20.93% ( $n = 18$ ) of Muslims, 1.16% ( $n = 1$ ) of Christians and 1.16% ( $n = 1$ ) of Sikhs had mood-congruent psychotic features, while 83.33% ( $n = 5$ ) of Hindus and 16.67% ( $n = 1$ ) of Muslims had mood-incongruent psychotic features. Religion was found to be statistically insignificant in our study. 20 (23.26%) patients were single, 60 (69.77%) married and 6 (6.98%) were divorced amongst those who displayed mood-congruent psychotic features while 1 (16.67%) patient who had mood-incongruent psychotic features was single and 5 (63.33%) were married. 32 (38.37%) were housewives, 12 (13.95%) were labourers, 6 (6.98%) students, 12 (13.95%) were involved in skilled, 18 (20.95%) in unskilled work and 5 (5.81%) were unemployed amongst the mood-congruent psychotic features sub-group, while 1 (16.67%) patient was a housewife, 3 (50.0%) labourers, and 2 (33.33%) were involved in skilled work in the group of patients having mood-incongruent psychotic features (Table 2).

Mean age at onset was 27.76 ( $\pm 8.54$ ) years for patients with mood-congruent psychotic features and 28.00 ( $\pm 11.08$ ) years for patients

with mood-incongruent psychotic features. 62 (72.09%), 18 (20.98%) and 6 (6.98%) patients with mood-congruent psychotic features had the first episode as manic, depressive and mixed polarity respectively. 5 (83.33%) and 1 (16.67%) patients with mood-incongruent psychotic features had the first-episode polarity as, respectively, manic and depressive. Mean number of previous episodes for manic, depressive and mixed type were respectively 2.59 ( $\pm 2.17$ ), 0.90 ( $\pm 1.89$ ) and 0.16 ( $\pm 0.48$ ) for mood-congruent psychotic features while the mean number of the previous episodes of mania and depression for mood-incongruent sub-group were respectively 2.33 ( $\pm 1.51$ ) and 0.83 ( $\pm 0.75$ ). Family history for major depression, bipolar disorder and schizophrenia were respectively 2 (2.33%), 25 (29.07%) and 1 (1.16%) for mood-congruent psychotic features. Family history for depression in patients with mood-incongruent psychotic features was 1 (6.67%). In patients with mood-congruent psychotic features, 29.07% ( $n = 25$ ) of patients had a positive family history for BD. Two (2.33%) patients with mood-congruent psychotic features had a lifetime history of a suicide attempt. There was no lifetime history of suicide in patients with mood-incongruent psychotic features. Amongst those with mood-congruent psychotic features, 40 (46.51%) had no psychoactive substance use, 25 (29.07%) had nicotine use, 11 (12.07%) alcohol, 2 (2.33%) cannabis use and 8 (9.30%) patients had use of both alcohol and cannabis. 1 (16.67%) of the patients with mood-incongruent psychotic features had no psychoactive substance use, 3 (50.0%) and 1 (16.67%) patients with mood-incongruent psychotic features had respectively use of no psychoactive substance, nicotine, alcohol and alcohol with cannabis. 62 (72.09%) and 5 (83.33%) patients had a history of electroconvulsive therapy (ECT) administration in their lifetime for mood-congruent psychotic features and mood-incongruent psychotic features, respectively (Table 3).

**Table 1.** Prevalence of mood-congruent psychotic features and mood incongruent psychotic features in bipolar disorder ( $n = 92$ )

Variable	Cases (n)	Prevalence (%)
Total patients with bipolar disorder	188	100.00
Patients with psychotic features	92	48.94
Mood-congruent psychotic features	86	45.74 (93.47) <sup>a</sup>
Mania	68	36.17 (73.91) <sup>a</sup>
Depression	15	7.98 (16.30) <sup>a</sup>
Mixed	3	1.59 (3.26) <sup>a</sup>
Mood-incongruent psychotic features (all manic patients)	6	3.19 (6.52) <sup>a</sup>

<sup>a</sup> Prevalence of psychotic features out of total bipolar disorder



**Table 2.** Socio-demographic characteristics of patients with mood-congruent and mood-incongruent psychotic features in bipolar disorder ( $n = 92$ )

Variable	Mood-congruent psychotic features $n = 86$ Mean (SD)/ $n$ (%)	Mood-incongruent psychotic features $n = 6$ Mean (SD)/ $n$ (%)	$t$ or $\chi^2$ -value	$p$ -value
Age (years)	35.22 (12.12)	37.67 (11.86)	-0.48	0.633
Gender			1.36	0.244
Male	51 (59.30%)	5 (83.33%)		
Female	35 (40.70%)	1 (16.67%)		
Education (years)	7.66 (4.43)	5.50 (4.59)	1.16	0.251
Religion			0.22	0.974
Hindu	66 (76.74%)	5 (83.33%)		
Muslim	18 (20.93%)	1 (16.67%)		
Christian	1 (1.16%)	0 (0%)		
Sikh	1 (1.16%)	0 (0%)		
Marital status			0.67	0.715
Single	20 (23.26%)	1 (16.67%)		
Married	60 (69.77%)	5 (83.33%)		
Divorced	6 (6.98%)	0 (0%)		
Occupation			8.59	0.126
Housewife	33 (38.37%)	1 (16.67%)		
Labourer	12 (13.95%)	3 (50.00%)		
Student	6 (6.98%)	0 (0%)		
Skilled	12 (13.95%)	2 (33.33%)		
Unskilled	18 (20.93%)	0 (0%)		
Unemployed	5 (5.81%)	0 (0%)		

Values for categorical and continuous variable are expressed in percentages and mean  $\pm$  SD, respectively.  $p > 0.05$

The types of delusions were found to be significantly associated with mood congruency/incongruency of the index mood episode. A statistically significant difference ( $p = 0.000$ ) was found for grandiose delusion (72.09%,  $n = 63$ ) and religious delusion (8.11%,  $n = 7$ ) in patients with mood-congruent psychotic features. This finding is consistent with the manic symptomatology given in the DSM-IV-TR. A statistically significant difference ( $p = 0.000$  significance) was found for delusional jealousy, i.e. 100% ( $n = 6$ ) in manic patients with mood-incongruent psychotic features (Tables 4, 5).

Patients with bipolar depression with mood-congruent psychotic features were found to have a statistically significant difference ( $p = 0.000$  significant) in the study in having guilt, 6.67% ( $n = 1$ ), reference, 33.33% ( $n = 5$ ), jealousy, 33.33% ( $n = 5$ ), and persecutory delusions, 26.67% ( $n = 4$ ), which also are consistent with the depressive symptomatology given in DSM-IV-TR. In our study, patients having mixed mood features with mood-congruent psychotic features were found

to have a statistically significant difference ( $p = 0.000$  significant) in the study in having grandiose, 66.67% ( $n = 2$ ), and persecutory, 33.33% ( $n = 1$ ), delusions.

YMRS total scores were 39.16 ( $\pm 7.18$ ) and 27.67 (3.93) in patients with mood-congruent psychotic features and mood-incongruent psychotic features, respectively, which means that patients with mood-congruent psychotic features were found to have more severe manic features ( $p = 0.000$ , significant) than mood-incongruent psychotic features. MADRS total score was 40.07 ( $\pm 3.96$ ) in patients with mood-congruent psychotic features. No statistically significant difference was found in SAPS score [27.22 ( $\pm 11.42$ ) and 29.67 ( $\pm 1.51$ ) in patients with mood-congruent and mood-incongruent psychotic features respectively ( $p < 0.05$ )] (Table 6).

## Discussion

In our study, almost half the total BD patients had associated psychotic features. Of these, the majority had mood-congruent psychotic features

**Table 3.** Characteristics of illness variables correlation in patients with mood-congruent and mood-incongruent psychotic features in bipolar disorder ( $n = 92$ )

Variable	Mood-congruent psychotic features $n = 86$ Mean (SD)/ $n$ (%)	Mood-incongruent psychotic features $n = 6$ Mean (SD)/ $n$ (%)	$t$ or $\chi^2$ -value	$p$ -value > 0.05
Age at onset	25.76 (8.54)	28.00 (11.08)	-0.39	0.696
1 <sup>st</sup> episode polarity			0.57	0.754
Manic	62 (72.09%)	5 (83.33%)		
Depression	18 (20.93%)	1 (16.67%)		
Mixed	6 (6.98%)	0 (0%)		
Current episode			1.56	0.458
Manic	68 (79.07%)	6 (100.00%)		
Depression	15 (17.44%)	0 (0%)		
Mixed	3 (3.49%)	0 (0%)		
No previous manic episode	2.59 (2.17)	2.33 (1.51)	0.29	0.774
No previous depressive episode	0.90 (1.89)	0.83 (0.75)	0.08	0.937
No previous mixed episode	0.16 (0.48)	0 (0)	0.87	0.387
Family history			3.91	0.271
Nil	58 (67.44%)	5 (88.33%)		
Depression	2 (2.33%)	1 (16.67%)		
Bipolar disorder	25 (29.07%)	0 (0%)		
Schizophrenia	1 (1.16%)	0 (0%)		
Suicide attempt, lifetime			0.14	0.706
Yes	2 (2.33%)	0 (0%)		
No	84 (97.67%)	6 (100.00%)		
Substance use			6.98	0.137
Nil	40 (46.51%)	1 (16.67%)		
Nicotine	25 (29.07%)	1 (16.67%)		
Alcohol	11 (12.79%)	3 (50.00%)		
Cannabis	2 (2.33%)	0 (0%)		
Alcohol + cannabis	8 (9.30%)	1 (16.67%)		
History ECT lifetime			0.36	0.550
Yes	62 (72.09%)	5 (83.33%)		
No	24 (27.91%)	1 (16.67%)		

Values for categorical and continuous variable are expressed in percentages and mean  $\pm$  SD, respectively.  $p > 0.05$

and they were found primarily in patients with manic symptoms.

No statistically significant correlation was found between socio-demographic and illness-related variables and psychotic features.

The most common mood-congruent psychotic features were grandiose delusions followed by religious delusions while a common finding in mood-incongruent psychotic features was delusion of jealousy. These observations were consistent with symptomatology described in DSM-IV-TR.

The study found that the Young's Mania Rating Scale score was significantly higher for

those with mood-congruent psychotic features as compared to mood-incongruent psychotic features while Scale for Assessment of Positive Symptoms scores showed no significant difference between the two.

### Prevalence of psychotic symptoms

In our study, 45.74% of patients had mood-congruent psychotic features, which was comparable to the results obtained in previous studies by Tohen *et al.* (1992) and Keck *et al.* (2003) (44.4% and 39.0% had mood-incongruent psychotic features respectively).

**Table 4.** Phenomenology of psychotic symptoms score in mood-congruent versus mood-incongruent psychotic patients

Variable	Mood-congruent psychotic features (both mania and depression) <i>n</i> = 86 (%)	Mood-incongruent psychotic features <i>n</i> = 6 (%)	$\chi^2$ -value	<i>p</i> -value
SAPS item score			34.85	0.000*
Grandiose delusions	63 (72.09%)	0 (0%)		
Religious delusions	7 (8.14%)	0 (0%)		
Guilt delusions	1 (1.16%)	0 (0%)		
Reference delusions	5 (5.81%)	0 (0%)		
Jealous delusions	5 (5.81%)	6 (100.00%)		
Persecutory delusions	5 (5.81%)	0 (0%)		

\**p* < 0.001**Table 5.** Types of delusions in mood-congruent psychotic features in bipolar disorder (*n* = 86)

Type of delusions	Mania ( <i>n</i> = 68)	Depression ( <i>n</i> = 15)	Mixed ( <i>n</i> = 3)	$\chi^2$ value	<i>p</i> -value
Grandiose delusions	61 (89.71%)	0 (0%)	2 (66.67%)	86.52	0.000*
Religious delusions	7 (10.29%)	0 (0%)	0 (0%)		
Guilt delusions	0 (0%)	1 (6.67%)	0 (0%)		
Reference delusions	0 (0%)	5 (33.33%)	0 (0%)		
Jealous delusions	0 (0%)	5 (33.33%)	0 (0%)		
Persecutory delusions	0 (0%)	4 (26.67%)	1 (33.33%)		

\**p* < 0.001**Table 6.** Manic, depressive and positive symptoms in patients with mood-congruent and mood-incongruent psychotic features in bipolar disorder (*n* = 92)

	Mood-congruent psychotic features Mean (SD)	Mood-incongruent psychotic features Mean (SD)	<i>t</i> -value	<i>p</i> -value
YMRS total score	39.16 (7.18), <i>n</i> = 68	27.67 (3.93), <i>n</i> = 6	3.86	0.000*
MADRS total score	40.07 (3.96), <i>n</i> = 15	<i>n</i> = 0	–	–
SAPS total score	27.22 (11.42), <i>n</i> = 86	29.67 (1.51), <i>n</i> = 6	0.52	0.603

\**p* < 0.01

A study from Italy by Altamura *et al.* in 2019 found presence of lifetime psychotic symptoms in 46.7% of the sample population. In our study, 3.19% of patients had mood-incongruent psychotic features while van Bergen *et al.* (2019), Azorin *et al.* (2006) and Tohen *et al.* (1992) reported that 21.2%, 33.4% and 55.6% of patients had mood-incongruent psychotic features respectively. A lower rate of prevalence of mood-incongruent psychotic features was found in our study population as compared to other above-mentioned studies from different parts of the world, which may be due to differences in sample size, race, methodology, screening instruments, gender distribution, lack of longitudinal studies and genetic susceptibility.

## Demographic characteristics and life course

Tohen *et al.* (1992) reported that 30 (55.6%) female and 24 (44.4%) male patients had either mood-congruent or mood-incongruent psychotic features but psychotic features were not dichotomized into either mood-congruent or incongruent in this study. Azorin *et al.* (2006) also reported that a higher proportion of female patients (67.2%) had mood-congruent psychotic features as compared to males (51.1%). Toni *et al.* (2001) reported females representing 49.3% (*n* = 34) of patients having mood-incongruent psychotic features and 46.5% (*n* = 40) of patients having either mood-congruent or no psychotic features. Marneros *et al.* (2009) also

reported females comprising 60.0% ( $n = 37$ ) of the sub-group having mood-incongruent psychotic features and 43% ( $n = 52$ ) of the sub-group with mood-congruent or no psychotic features. These studies have indicated the possibility of higher prevalence of mood-incongruent psychotic features in female gender. Our study found no significant correlation between gender and presence of mood-incongruent psychotic features (which may be due to cultural difference). In this study, mean education in years was 7.66 (4.43) and 5.50 (4.59) respectively for mood-congruent and mood-incongruent psychotic features. Toni *et al.* (2001) reported that most patients of both groups attended eight or more years of school. No significant correlation with education level was found in our and other studies. Religion as a socio-demographic variable was not considered in previous studies but we factored it in due to the cultural diversity of our study population. We found it to be statistically insignificant.

Azarin *et al.* (2006) reported higher representation of single, divorced or widowed in the mood-congruent psychotic group while in our study, the majority were married. These differences might be due to sample biases and our social structure discouraging post-marital separation. Tohen *et al.* (1992) reported that 16 (29.6%) were married and 38 (70.4%) were unmarried in their study group. Toni *et al.* (2001) reported 46.4% being married and 13.8% unmarried patients in their mood-incongruent psychotic feature group. Marneros *et al.* (2009) did not study marital status in patients with the psychotic feature of either type.

Azarin *et al.* (2006) and Marneros *et al.* (2009) did not study the correlation of occupation with psychotic features in bipolar disorder. Toni *et al.* (2001) found that 18.8% were housewives, 18.6% were involved in blue-collar jobs (semi-skilled/unskilled), 10.1% in white-collar jobs (skilled) and 15.9% were unemployed in the mood-incongruent psychotic features subgroup. In our study, the occupation was not found to be significantly associated with any of the study variables. Age at onset (of 1<sup>st</sup> episode) was very similar to the mean reported by Azarin *et al.* (2006) respectively for mood-congruent and incongruent subtype, 27.4 ( $\pm 10.4$ ) and 25.9 ( $\pm 9.1$ ). In addition, Dell'Osso *et al.* (2017) found that mean age at onset was 27.7  $\pm 10.5$  in bipolar patients with psychotic symptoms. A statistically significant difference in age of onset of the first episode between mood-congruent and mood-incongruent psychotic symptoms was not

observed, corroborating previous reports (Kendler 1991; Toni *et al.* 2001; Keck *et al.* 2003).

Azarin *et al.* (2006) reported that 103 (57.5%), 51 (28.5%) and 25 (14.0%) patients with mood-congruent psychotic features had the first-episode polarity as respectively manic, depressive and mixed episodes, while 224 (61.5%), 94 (25.8%) and 46 (12.6%) patients with mood-incongruent psychotic features had the first-episode polarity respectively as manic, depressive and mixed. Toni *et al.* (2001) reported that 29 (42.0%), 33 (47.8%) and 7 (10.1%) patients with mood-incongruent psychotic features had the first-episode polarity respectively as manic, depressive and mixed episode. 21 (24.4%), 55 (63.9%) and 10 (11.8%) patients with no mood-incongruent psychotic features had the first-episode polarity respectively as mania, depressive and mixed episode. Dell'Osso *et al.* (2017) reported that 55.2% and 24.4% of patients with psychotic features had the first-episode polarity respectively as elevated and depressive ( $p < 0.001$ ). As in previous studies (Kendler 1991; Toni *et al.* 2001; Keck *et al.* 2003), no statistically significant differences between the two groups was found for the first episode polarity in the current study. Marneros *et al.* (2009) did not report the first episode polarity in both groups.

Azarin *et al.* (2006) reported that the mean number of previous episodes was 6.2 ( $\pm 6.1$ ) and 7.2 ( $\pm 6.9$ ) respectively for mood-congruent and mood-incongruent psychotic features; however, no further classifications were done in this study. Marneros *et al.* (2009) reported that the mean number of previous episodes was 8.3 ( $\pm 6.18$ ) and 6.13 ( $\pm 5.14$ ) respectively for mood-incongruent psychotic features and without mood-incongruent psychotic features. In our study, no significance was found for the number of previous episodes according to polarity, similar to the findings of previous studies (Kendler 1991; Toni *et al.* 2001; Keck *et al.* 2003). In our study, in patients with mood-congruent psychotic features, 29.07% ( $n = 25$ ) of patients had a positive family history for BD. Toni *et al.* (2001) reported that the percentage for positive family history for major depression was 29.0% ( $n = 20$ ) and bipolar disorders 26.1% ( $n = 18$ ) in patients with mood-congruent psychotic features while 22.1% ( $n = 19$ ) and 18.6% ( $n = 16$ ) had a positive family history for major depression and BD respectively in patients with mood-incongruent psychotic features.

No patients with mood-incongruent psychotic features and 2 patients with mood-congruent



psychotic features were found to have lifetime history of suicide in our study. Azorin *et al.* (2006) reported that 1 (2.2%) patient with mood-incongruent psychotic features and 0.9 ( $\pm 2.9$ ) patients with mood-congruent psychotic features had a positive history of a suicide attempt. Tohen *et al.* (1992) reported that 3 (4.3%) patients with mood-incongruent psychotic features had attempted suicide in the current episode. Our study results are in accordance with the above-mentioned studies for lifetime incidence of a suicide attempt. In contrast, Dell'Osso *et al.* (2017) found 25.6% of patients with psychotic symptoms had a lifetime history of attempted suicide. More than half the patients in both sub-groups had a history of psychoactive substance use. Substance use was not taken into consideration by Tohen *et al.* (1992), Azorin *et al.* (2006), and Marneros *et al.* (2009) in their patient groups. Only 24 (27.91%) and 1 (16.67%) patients with mood-congruent and mood-incongruent psychotic features had no history of electroconvulsive therapy in their lifetime, respectively. Tohen *et al.* (1992), Azorin *et al.* (2006) and Marneros *et al.* (2009) did not study this variable. This may be due to the fact that our study was conducted in the western region of India, where electroconvulsive therapy (ECT) is frequently used as treatment modality.

### Clinical characteristics

Azorin *et al.* (2006) found a statistically significant difference for grandiose, religious, somatic and referential delusions. Toni *et al.* (2001) reported significant presence of persecutory and referential delusions in patients with mood-incongruent psychotic features. Tohen *et al.* (1992) reported that 64.8% ( $n = 35$ ) of patients had paranoid delusions but did not mention about congruency or incongruency as they used DSM-III-R, in which this specifier was not mentioned. Toni *et al.* (2001) reported higher scores on auditory hallucinations in contrast to our study as no patients reported auditory hallucinations in either group. In our study, no statistically significant findings were obtained for thought withdrawal, thought insertion, thought broadcasting or delusions of control. A similar lack of findings was reported in previous studies by Toni *et al.* (2001) and Azorin *et al.* (2006) as far as thought phenomena are concerned. In our study, patients with depression with mood-congruent psychotic features were found to have a statistically significant difference ( $p = 0.000$ , significant) for frequency of delusions of guilt

6.67% ( $n = 1$ ), reference 33.33% ( $n = 5$ ), jealousy 33.33% ( $n = 5$ ) and persecutory delusions 26.67% ( $n = 4$ ), which is consistent with the depressive symptomatology given in DSM-IV-TR. However, no depressive patients were included in the studies by Tohen *et al.* (1992), Azorin *et al.* (2006) and Toni *et al.* (2001). In the study by Azorin *et al.* (2006) also, very similar results were obtained in this area, i.e. a statistically significant difference was obtained between the two groups in their YMRS total score. In addition, in the sample of the BD group, 916 patients (92.5%) had experienced delusions. Within this group, 61.7% had a history of delusions of grandiosity, 61.5% delusions of reference, and 38.5% persecutory delusions, and symptoms including somatic, erotomanic delusions, and delusions of jealousy and guilt occurred in 39.9% of the psychotic patients. A history of hallucinations occurred in 58.0% of patients, of whom 33.4% had a history of auditory hallucinations and 39.0% visual hallucinations, while 20.9% had both (van Bergen *et al.* 2019).

### Limitations

This study is a cross-sectional study so causality of an observed associated variable cannot be ascertained. The study was done in a hospital setting in inpatients only so the prevalence rate cannot be generalized to a larger population. Future multi-centric studies are required for applicability and generalization of the results.

### Conclusions

Overall, our findings suggest that mood-congruent psychotic symptoms in BD are associated with a more severe, predominantly manic illness course. In future research, the role of recent genetic insights may provide a lead in further unravelling the aetiology of psychosis across psychiatric disorders.

### Disclosure

The authors declare no conflict of interest.

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