A factor analytical study report on mania from Nepal

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ABSTRACT

Background and Objectives: Phenomenological studies on mood disorder are rare in Nepal which prompted us to undertake the current factor analytical study of mania.

Materials and Methods: It was a cross-sectional descriptive study for which we did purposive sampling technique according to certain inclusion and exclusion criteria. The study sample consists of fifty patients, who fulfilled the International Classification of Diseases, Tenth Edition (ICD-10) diagnostic criteria for Manic Episode and/or Bipolar Affective Disorder-current episode mania. Tools used were ICD-10 Diagnostic Criteria for Research, Young’s Mania Rating Scale (YMRS), and Brief Psychiatric Rating Scale (BPRS). Principal component factor analysis was applied to the 35 symptoms taken from YMRS and BPRS.

Results: Factor analysis revealed the presence of four main factors, which explained 51.082% of the total variance. These are “pure mania” which isolated 11 manic symptoms, “dysphoric mania” which isolated five depressive symptoms, “hostile mania” which isolated six symptoms, and the fourth factor, we called it “delirious mania,” isolated four symptoms.

Conclusion: The identified factors and subtypes are a useful conceptualization of atypical features among patients with acute mania. Further validation studies are required to determine whether the identified subtypes are of clinical and theoretical importance.

Key words: Delirious mania, dysphoric mania, factor analysis, hostile mania, mania, pure mania

INTRODUCTION

In 1899, Emil Kraepelin categorized mental disorder into two groups: “dementia praecox” and “manic–depressive psychosis.”¹ He was one of the first authors to describe the clinical subtypes of affective disorder (bipolar disorder, manic, depressive, and mixed types) and directed attention toward the depressive and labile features of mania.² More than 70% of all manic cases showed elated/euphoric mood, decreased need for sleep, or racing thoughts. Roughly 69% of cases also showed poor judgment, whereas only half of bipolar cases demonstrated flight of ideas, and slightly more than one-third showed hypersexuality or psychotic features.³

Kraepelein later described six types of mixed states based on various combinations of mood, will (volition), and thought processes: manic stupor (elevated mood but decreased will and thought), depressed mania (depressed mood but elevated will and thought), excited depression (depressed mood but elevated will and thought), excited depression (depressed mood and will but elevated thought), depression with
flight of ideas (depressed mood and thought but elevated will), mania with poverty of thought (elevated mood and will but decreased thought), and inhibited mania (elevated mood and thought but decreased will). Phenomenological studies are rare in Nepal which prompted us to undertake the current factor analytical study of mania.

**MATERIALS AND METHODS**

The study was conducted in the Department of Psychiatry, Universal College of Medical Sciences-Teaching Hospital (UCMS-TH), Bhairahawa, Nepal. It was a cross-sectional descriptive study for which we did purposive sampling technique according to certain inclusion and exclusion criteria. The samples were recruited from patients admitted in our inpatient psychiatry department in UCMS-TH. A total of fifty patients were recruited for the study, within a stipulated time period. Inclusion criteria were patients fulfilling and diagnosed as the first-episode mania and/or bipolar affective disorder-current episode mania or mixed episode according to the International Classification of Diseases, Tenth Edition (ICD-10) Diagnostic Criteria for Research (ICD-10), either sex in the age range of 15–45 years, drug naïve, and having given informed consent for the study. Exclusion criteria were substance-induced mood disorder-mania, organic mood disorder, diagnosis of mania in a mentally disabled person, and patients who were not cooperative and who did not gave consent for the study.

**Procedure**

All the patients who were registered in our outpatient department were initially worked up by a junior resident of the department. Detailed case histories were presented before the consultant of the department to reach a diagnosis and decision regarding the treatment and the disposal of the patients. The admitted patients were presented during the next day round in front of all the consultants of the department. A final consensus diagnosis used to be arrived at and a treatment plan was instituted. All the consecutive drug naïve cases of the current episode mania and/or bipolar affective disorder-current episode mania or mixed episode, who were admitted and meeting the inclusion and exclusion criteria, were finally taken up for the present study. All these cases were interviewed in detail before they were administered drugs. A self-designed semi-structured questionnaire was used to note down the sociodemographic and clinical variables of all these patients. Symptoms of the individual patients were assessed using the Young’s Mania Rating Scale (YMRS) and Brief Psychiatric Rating Scale (BPRS) during initial take up of each patient. YMRS and BPRS were re-applied again after 48 h of admission in the ward. Individual items of the YMRS and BPRS with higher scores, among these two ratings, were considered for the final analysis. Informed consent was taken from all the patients before starting the assessment.

**Statistical analysis**

All analyses were done using the IBM Statistical Package for the Social Sciences version 16.0.

**RESULTS**

Mean duration of illness in our patients before they get admitted was approximately 20 days (standard deviation [SD] = 30.8). Forty-two percent (21) of the patients had a diagnosis of the first manic episode while the rest had multiple episodes in their past leading to a diagnosis of bipolar affective disorder [Table 1].

Factor analysis was done on 35-item scores obtained from YMRS and BPRS. Principal component analysis followed by Varimax rotation was conducted for these 35 symptoms. Factors that have an eigenvalue score >1 were compared with the scree plot test, and three levels of prediction of total variance was calculated. Items that were loaded in factors and those that have factor loads >0.40 were presented. In our study, Kaiser–Meyer–Olkin measure is 0.560, and Bartlett’s test of sphericity reveals a Chi-square value of 1.153E3 which is highly statistically significant ($P < 0.001$), indicating that the number of sample was adequate for our study.

Table 2 explains that the ten variables have more than one eigenvalue and their cumulative percentage as 76.4%.

Upon inspection of the scree plot (Figure 1) and eigenvalues table 2, we found that the line produces a departure from linearity coinciding with a 4-factor result. Therefore, this

### Table 1: Sociodemographic and clinical profile of patients (n=50)

| Demographic variables | n (%)/mean (SD) |
|-----------------------|----------------|
| Age in years, mean (SD) | 30.2 (9.9) |
| Sex, n (%)         |               |
| Male                | 26 (52) |
| Female              | 24 (48) |
| Education in years, mean (SD) | 7.3 (5.2) |
| Marital status, n (%)     |           |
| Married             | 17 (34) |
| Unmarried           | 33 (66) |
| Region, n (%)       |             |
| Terai               | 28 (56) |
| Hilly               | 22 (44) |
| Family type, n (%)  |             |
| Nuclear             | 39 (78) |
| Joint               | 11 (22) |
| Duration of illness (days), mean (SD) | 19.9 (30.8) |
| ICD-10 diagnosis, n (%) |           |
| Manic episode       | 21 (42) |
| BAD Mania           | 29 (58) |
| Family history present, n (%) | 14 (28) |
| YMRS score, mean (SD) | 33.5 (8.95) |
| BPRS score, mean (SD) | 57.2 (12.2) |

SD – Standard deviation; YMRS – Young’s Mania Rating Scale; BPRS – Brief Psychiatric Rating Scale; ICD – International Classification of Diseases
scree test indicates that the data should be analyzed for four factors [Table 3 and Figure 1].

**DISCUSSION**

The current study aimed to investigate the symptom dimensions of a group of fifty manic patients and manic episodes and/or mixed episodes of bipolar disorder. We conducted factor analysis with the 35 YMRS and BPRS scores on these fifty patients. We found ten related factors: pure mania, dysphoric mania, hostile mania, delirious mania, psychotic mania (mood incongruent), absent insight, hallucination, manic stupor, psychotic mania, and increased libido. The first four factors explained 51.082% of the total variance. The rotated factor loadings >0.4 and percent variance explained by each extracted factor are shown in Table 3. All symptoms were loaded on one factor each.

Although the factor structure in our study was based on the scores of different scales, our findings suggest that pure mania, dysphoric mania, hostile mania, and delirious mania are of independent dimensions, which is similar to some previous factor analytical studies reported in literature.\[8-10\] The first factor, "pure mania," isolated 11 manic symptoms. These are elated mood, elevated mood, increased motor activity, speech, grandiosity, motor hyperactivity, content, distractibility, unusual thought content, excitement, mannerism and posturing. The first factor explained 26.145% of the total variance.

Our study identified "pure mania" as the most important factor in factor analysis. Cassidy et al. isolated two factors for similar symptoms.\[8\] This may be explained by the fact that our study included a broader range of psychiatric symptoms. The dissimilarity may suggest that the possible diversity of pure manic symptoms among manic patients, as shown in their study, is not significant when a broader range of psychiatric symptoms is considered. A recent cluster analysis study proposed three manic

![Table 2: Factor analysis of symptoms with total variance explained](image-url)

| Component | Initial eigenvalues | Extraction sums of squared loadings | Rotation sums of squared loadings |
|-----------|---------------------|-------------------------------------|----------------------------------|
|           | Total               | Percentage of variance              | Cumulative percentage            | Total               | Percentage of variance | Cumulative percentage |
| 1         | 9.151               | 26.145                              | 26.145                           | 9.151               | 26.145              | 26.145               |
| 2         | 4.031               | 11.517                              | 37.662                           | 4.031               | 11.517              | 37.662               |
| 3         | 2.664               | 7.612                               | 45.274                           | 2.664               | 7.612               | 45.274               |
| 4         | 2.033               | 5.808                               | 51.082                           | 2.033               | 5.808               | 51.082               |
| 5         | 1.988               | 5.681                               | 56.763                           | 1.988               | 5.681               | 56.763               |
| 6         | 1.688               | 4.824                               | 61.586                           | 1.688               | 4.824               | 61.586               |
| 7         | 1.433               | 4.095                               | 65.682                           | 1.433               | 4.095               | 65.682               |
| 8         | 1.345               | 3.842                               | 69.524                           | 1.345               | 3.842               | 69.524               |
| 9         | 1.215               | 3.471                               | 72.995                           | 1.215               | 3.471               | 72.995               |
| 10        | 1.183               | 3.380                               | 76.375                           | 1.183               | 3.380               | 76.375               |
| 11        | 0.960               | 2.742                               | 79.117                           | 0.960               | 2.742               | 79.117               |
| 12        | 0.928               | 2.652                               | 81.769                           | 0.928               | 2.652               | 81.769               |
| 13        | 0.835               | 2.384                               | 84.153                           | 0.835               | 2.384               | 84.153               |
| 14        | 0.626               | 1.787                               | 85.940                           | 0.626               | 1.787               | 85.940               |
| 15        | 0.576               | 1.647                               | 87.587                           | 0.576               | 1.647               | 87.587               |
| 16        | 0.518               | 1.479                               | 89.066                           | 0.518               | 1.479               | 89.066               |
| 17        | 0.487               | 1.391                               | 90.457                           | 0.487               | 1.391               | 90.457               |
| 18        | 0.450               | 1.284                               | 91.741                           | 0.450               | 1.284               | 91.741               |
| 19        | 0.384               | 1.096                               | 92.838                           | 0.384               | 1.096               | 92.838               |
| 20        | 0.360               | 1.030                               | 93.867                           | 0.360               | 1.030               | 93.867               |
| 21        | 0.336               | 0.960                               | 94.827                           | 0.336               | 0.960               | 94.827               |
| 22        | 0.290               | 0.829                               | 95.656                           | 0.290               | 0.829               | 95.656               |
| 23        | 0.244               | 0.698                               | 96.354                           | 0.244               | 0.698               | 96.354               |
| 24        | 0.214               | 0.612                               | 96.966                           | 0.214               | 0.612               | 96.966               |
| 25        | 0.185               | 0.529                               | 97.495                           | 0.185               | 0.529               | 97.495               |
| 26        | 0.164               | 0.470                               | 97.964                           | 0.164               | 0.470               | 97.964               |
| 27        | 0.162               | 0.463                               | 98.427                           | 0.162               | 0.463               | 98.427               |
| 28        | 0.132               | 0.376                               | 98.803                           | 0.132               | 0.376               | 98.803               |
| 29        | 0.122               | 0.350                               | 99.152                           | 0.122               | 0.350               | 99.152               |
| 30        | 0.095               | 0.270                               | 99.423                           | 0.095               | 0.270               | 99.423               |
| 31        | 0.071               | 0.203                               | 99.626                           | 0.071               | 0.203               | 99.626               |
| 32        | 0.043               | 0.124                               | 99.749                           | 0.043               | 0.124               | 99.749               |
| 33        | 0.037               | 0.106                               | 99.855                           | 0.037               | 0.106               | 99.855               |
| 34        | 0.034               | 0.098                               | 99.953                           | 0.034               | 0.098               | 99.953               |
| 35        | 0.016               | 0.047                               | 100.000                          | 0.016               | 0.047               | 100.000              |

Extraction method: Principal component analysis
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phenomenological presentations (euphoric, dysphoric, and depressive). Their euphoric mania closely resembles our pure manic subtype. Consistent with our results, their study also suggested that there are several different manic presentations besides pure mania. The symptom profile of the other two subtypes was, however, greatly different from our subtypes.

The second factor, we named as "dysphoric mania," isolated five depressive symptoms. These are depression, suicidality, guilt, emotional withdrawal, and anxiety. The second factor explained 11.517% of the total variance. Our second factor, dysphoric mania, was consistent with that in the existing literature.

Studies that included or did not include patients with mixed episode reported that depressive symptoms were commonly seen among patients with mania. In a study by Cassidy et al., which included 237 patients with bipolar disorder, the factor structure did not change significantly even after the exclusion of 33 patients with mixed episode. Similar to the above study, Rossi et al. found that even after the exclusion of patients with mixed episodes, the depressive dimension in mania still existed. They suggested that the depression dimension is not specific to patients who have mixed episodes. In addition, depressive symptoms in mania were found to be related to paranoid-destructive factors. Researchers found another independent factor,
depressive inhibition, which was identified by Kraepelin.[11] Our findings are also in line with other previous studies that found depressive symptoms are independent of irritability and psychosis factors.[8,9]

Manic and depressed states are not mutually exclusive. Their combination in mixed states has been repeatedly described since the days of Kraepelin. The mixed state, also called depressed or dysphoric mania, is said to be common, potentially severe, can be difficult to treat, and has the potential to reveal much about the psychopathology and pathophysiology of manic depressive illness.[12] Yet, the lack of clear definition and boundaries for mixed states hinders definitive research and clinical work. Most definitions of mixed states have relied on the application of predetermined criteria for depressed symptoms or depressed syndromes to the group of patients meeting diagnostic criteria for mania.[13] Given this broad list of mixed states, we may conceptualize mood states on a continuum, with pure mania and pure depression at the extremes and a variety of mixed states in between, and then the majority of mood states would consist of mixed states, rather than pure depression or pure mania.[16]

The third factor, “hostile mania,” isolated six symptoms related to hostility and aggression. These are appearance, irritability, hostility, disruptive aggressive behavior, language thought disorders, and uncooperativeness. The third factor explained 7.612% of the total variance.

This is similar to the second factor of Cassidy et al. and the first factor of Kumar et al., reported in their studies.[8,17] The first factor of Kumar et al. represented “psychomotor acceleration” which consisted of motor activity, pressured speech, racing thoughts, increased contact, and increased sexuality.[17] The second factor of Cassidy et al. also represents “psychomotor acceleration,” the difference being that increased sexuality was not a component in their factor.[8] Increased sexuality is not a component of our third factor also, which was loaded as a separate factor. This “hostile mania” factor is included in the general factor of Murphy and Biegel and factor three of Double.[14,18] Factor three of Dilsaver et al. included the items of psychomotor acceleration.[9]

The fourth factor, we called it “delirious mania,” isolated four symptoms. These are tension, disorientation, self-neglect, and bizarre behavior. The fourth factor explained 5.808% of the total variance. In our study, the fourth factor represented “delirious mania” characterized by the presence of symptoms such as tension, disorientation, self-neglect, and bizarre behavior. This is a new factor observed by us and rarely reported in literature in the past.

No factor analytical studies, to the best of our knowledge, have reported this to be a valid factor in mania. In 1921, Kraepelin categorized mania into three types: acute, delusional, and delirious.[19,20] To describe the range of severity, Klerman described the spectrum of mania in five stages: normal, neurotic, hypomanic, manic, and delirious.[21]

Studies have shown a high incidence of disorientation, confusion, or delirium among manic inpatients, and have noted that these patients tend to be hospitalized longer than are manic patients without these additional symptoms.[21-23] Thus, the factor “delirious mania” though underreported in literature seems to be a valid entity while describing the phenomenology of mania. Delirious mania is a type of disorder where delirium and mania occur at the same time. This condition still has no formal diagnostic classification acceptance. To provide more information about this potentially life-threatening condition, Lee et al. studied five patients with delirious mania. Delirious mania remitted within seven sessions of the electroconvulsive therapy. Delirious mania is a potentially life-threatening but underrecognized neuropsychiatric syndrome.[24]

CONCLUSION

Our study revealed that most maniacs (48%) were from younger age groups (15–25 years). The mean age of patients was 30.2 years (SD = 9.9). Male and female representations were almost same. Factor analysis revealed the presence of four main factors, which explained 51.082% of the total variance. These are “pure mania” which isolated 11 manic symptoms, “dysphoric mania” which isolated five depressive symptoms, “hostile mania” which isolated six symptoms, and the fourth factor, we called it “delirious mania,” isolated four symptoms.

Few limitations may be noted in interpreting the results of the present study. First, the psychiatric symptoms were assessed only twice when the patients were hospitalized. Further study comparing the symptom factors at different stages of a manic episode is needed for the better understanding of evolution of symptom profiles of mania. Our study was also limited by a comparatively small sample size. However, a sample size of fifty patients satisfies the criteria for statistically acceptable factor analysis. To determine whether the identified subtypes are really of clinical and theoretical importance, however, further validation studies are required. We hope that further studies in this area will be undertaken in the future so that the phenomenology of mania, in particular, and bipolar disorders, in general, is further clarified, especially in relation to our culture in this small Himalayan nation.

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Conflicts of interest
There are no conflicts of interest.
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