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Original Article

Evaluation of patients with bipolar disorder symptoms hospitalized in non-psychiatric departments; a cross-sectional study

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Abstract

Background: Bipolar disorder is a chronic, debilitating, and costly psychiatric condition. This study aimed to investigate the frequency of bipolar disorder in patients hospitalized in non-psychiatric departments.

Methods: This cross-sectional study was conducted on patients admitted to departments of hospitals affiliated with Babol University of Medical Sciences from 2021 to 2022. Participants were assessed using a demographic questionnaire and the Bipolar Spectrum Diagnostic Scale (BSDS).

Results: Of 220 participants, 48.6% were women and 51.4% were men (mean age: 40.20±12.46 years). The prevalence of bipolar disorder symptoms was 21.8%. Significant correlations were found between bipolar symptoms and age, income, hospitalization department, and employment status. Patients aged 50–65 years (P=0.008), those with higher income (P=0.005), and those in cardiology (P=0.02) had lower BSDS scores. Unemployed individuals (P=0.01) and those with lower income had higher symptom rates.

Conclusion: Bipolar disorder symptoms are considerably more prevalent among patients in non-psychiatric departments than in the general population. Younger age, unemployment, and lower income are associated with higher symptom rates. Screening for bipolar disorder in non-psychiatric settings is recommended to enable early diagnosis and treatment.

Keywords: Bipolar disorder, Mood disorders, Inpatients

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Introduction

Bipolar disorder (BD) is a chronic [1, 2], episodic, and lifelong psychiatric disorder that is debilitating , relapsing [3], and costly, characterized by fluctuations in mood and energy [1, 4, 5]. The vast majority of BD cases are characterized by frequent episodes of depression and high mood (mania and hypomania) [6, 7]. This disorder is considered the fifth main cause of disability worldwide [8]. In the mental health surveys of the World Health Organization, this disorder is classified as the second disease with the greatest effect on a person's behavior [2].

This disorder leads to a decrease in the quality of life as well as cognitive and functional disorders and causes an increase in mortality, especially death by suicide [9]. BD significantly reduces psychosocial functioning and is associated with the loss of approximately 10 to 20 years of potential life. The mortality gap between populations with bipolar disorders and the general population is largely due to excess mortality from cardiovascular disease and suicide in bipolar disorder [10]. The impact of this disease on performance and health throughout a person's life causes disability even more than cancer and major neurological disorders such as Alzheimer's disease [11].

In Iran, the prevalence of bipolar disorder has been reported to be approximately 1-2% of the population, with a higher rate observed among hospitalized patients in medical departments [3, 12]. The prevalence of bipolar disorder in Iran reflects notable trends. A study conducted in 2022 indicated that the lifetime prevalence of bipolar disorder in the country is estimated at 1.1%, with a current prevalence of 0.92% in the adult population aged 18 to 65 [13, 14]. This rate is higher than the global average, highlighting the significant public health concern bipolar disorder poses within Iran. Moreover, the disorder's chronic nature, coupled with its severe social and economic impacts, necessitates increased awareness and early intervention [13, 15]. The prevalence of mood disorders in non-psychiatric departments of hospitals is quite significant, and according to the National Hospital Discharge Survey (NHDS), there is an average annual increase of 10% in the discharge rate of bipolar patients [1].

Given the chronic and recurring nature of bipolar disorder, early diagnosis and intervention can help mitigate its adverse effects [3, 7]. Furthermore, the high prevalence of medical conditions among individuals with bipolar disorder increases the risk of mortality and additional health complications. Considering disparities in healthcare access, screening for bipolar disorder in patients referred to non-psychiatric hospitals may facilitate a retrospective method of identification. Early detection in this context may facilitate more effective interventions and improve outcomes for these patients [1, 16].

Despite the increasing number of studies on bipolar disorders in outpatients and inpatients of psychiatric departments, our knowledge about the prevalence of its in other medical units is limited [3]. Considering the high prevalence and lack of frequent diagnosis of mood disorders in patients referred to non-psychiatric hospitals [1], and the absence of a similar study in the Babol, the present study aims to investigate the prevalence of bipolar disorder symptoms in hospitalized patients.

Methods

Sampling

This cross-sectional study was conducted on 220 patients hospitalized in internal medicine, surgery, and cardiology departments of Babol University of Medical Sciences hospitals from 2021 to 2022. Inclusion criteria included age 18-65 years, ability to speak Farsi, and having at least a fifth grade education. Exclusion criteria were mental retardation, cognitive disorders (such as dementia and delirium), hospitalization in ICU and CCU, and consumption of any addictive substance during the past month. The sample size was calculated by the formula of a proportion ($n=d2(z1-\alpha/2)2 \cdot p(1-p)$), considering the prevalence of 10% and the error of 0.04. The sampling method was convenience sampling among eligible patients. The researcher visited the departments of internal medicine, surgery and cardiology, explained the study to the patients, and distributed the questionnaire to the volunteers. The sample size in each department was identified according to the proportion of hospitalized patients. This study was approved with ethical code IR.MUBABOL.HRI.REC.1400.269.

Data collection method

This study was conducted after obtaining approval from the ethics committee of BUMS and informed written consent from patients hospitalized in the internal medicine, surgery, and cardiology departments of BUMS hospitals. In the first stage, the researcher attended the internal medicine, surgery, and cardiology departments after obtaining written consent from the patients, explained the study to them, and checked the inclusion criteria. After completing the initial stage and a self-made questionnaire (containing demographic information including age, sex, education, marital status, occupation, income level, and inpatient department) by the

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researcher, the patients were asked to read the questionnaire and answer the questions. The questionnaires were completed once by these patients during hospital discharge.

The research tools were two questionnaires: a demographic questionnaire (researcher-made) and the Bipolar Spectrum Diagnostic Scale (BSDS).

Bipolar Spectrum Diagnostic Scale (BSDS): The BSDS contains a total of 19 questions. The questionnaire is divided into two parts: the first part consists of a brief narrative with 13 items, and the second part includes 6 multiple-choice questions. In the first part, the questions are in the form of yes/no responses and aim to assess the general presence of bipolar disorder symptoms in the respondent. The second part consists of 6 multiple-choice questions, with scores ranging from 0 (does not describe me at all) to 6 (fits me perfectly). The total BSDS score ranges from 0 to 25. A score of 0 to 6 indicates an unlikely possibility, 7 to 12 a low probability, 13 to 19 an average probability, and 20 to 25 a high probability of bipolar disorder. According to the initial study, the sensitivity and specificity of the BSDS for screening bipolar disorder were 0.76 and 0.85, respectively[1, 4]. According to Ghaemi et al.[17], cases with a BSDS score of 13 or higher were considered positive screening cases.

Data analysis method

After collecting the questionnaires, the data were statistically analyzed using SPSS v.25 software. Frequency and percentage were reported to describe qualitative variables, and mean and standard deviation were reported for quantitative variables. The normality of quantitative variables was investigated using a histogram and the Kolmogorov-Smirnov test. The Mann-Whitney, Kruskal-Wallis, and chi-square tests were used to analyze the data. $P < 0.05$ was considered significant.

Results

The mean age of the participants was 40.20 ± 12.46 years (median: 39 years), ranging from 18 to 65 years. The mean BSDS score was 7.91 ± 6.59 (median: 7.5), ranging from 0 to 25. Among the 220 participants, 107 (48.6%) were women, and 72 (32.7%) were single. Regarding income level, 76 participants (34.5%) had no income. Ninety-four participants (42.7%) had a diploma or higher education. In terms of occupation, 70 participants (31.8%) were housewives (Table 1). Regarding the probability of bipolar disorder, 95 patients (43.2%) had an unlikely probability, 77 (35.0%) had a low probability, 38 (17.3%) had a moderate probability, and 10 (5.5%) had a high probability.

Table 1. Frequency and Percent Frequency of Demographic Characteristics of Patients Participating in the Study

Variable		Frequency (N)	Percent Frequency (%)
Gender	Female	107	48.60
	Male	113	51.40
Marital Status	Single	72	32.70
	Married	148	67.30
Income Level	No income	76	34.50
	Up to 5 million	49	22.30
	5 to 10 million	66	30.00
	More than 10 million	29	13.20
Education Level	Below diploma	52	23.60
	Diploma	74	33.60
	Diploma and above	94	42.80
Occupation	Housewife	70	31.80
	Employee	54	24.50
	Self-employed	60	27.30
	Retired	7	3.20
	Farmer	21	9.50
	Unemployed	8	3.60
Hospitalization Department	Internal Medicine	92	41.80
	Surgery	67	30.00
	Cardiology	61	27.70

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Table 2 shows the comparison of the mean BSDS score based on demographic characteristics and the probability of bipolar disorder. Based on the obtained results, the mean BSDS score did not differ between groups in terms of gender, marital status, or education, but it was lower in individuals with higher income levels. Additionally, this score was significantly higher in younger age groups and in unemployed individuals, and lower in patients hospitalized in the cardiology department. Table 3 shows the classification comparison of the probability of bipolar disorder based on demographic characteristics. Based on the obtained results, male gender, age groups below 50 years, income level, and occupation had a significant association with the probability of bipolar disorder classification. However, marital status, education level, and hospitalization department did not have a significant association with the probability of bipolar disorder classification

Table 2. Comparison of BSDS Questionnaire Score Based on Demographic Characteristics

Variable		Mean	Standard Deviation	P-value
Gender	Female	8.39	5.55	0.114*
	Male	7.45	7.43	
Age Group	18 to 34 years	8.68	5.72	**0.008****
	35 to 49 years	8.67	7.30	
	50 to 65 years	5.75	6.25	
Marital Status	Single	8.09	6.14	0.564*
	Married	7.81	6.81	
Income Level	No income	9.46	6.37	0.144**
	Up to 5 million	7.63	6.84	
	5 to 10 million	7.65	5.89	
	More than 10 million	4.89	7.31	
Education	Below diploma	8.23	7.26	0.929**
	Diploma	7.56	6.32	
	Diploma and above	8.00	6.45	
Occupation	Housewife	8.78	6.18	**0.013****
	Employee	7.16	5.53	
	Self-employed	8.75	7.50	
	Retired	3.85	3.80	
	Farmer	4.42	6.18	
	Unemployed	11.62	8.19	
Hospitalization Department	Internal Medicine	8.57	6.33	**0.022****
	Surgery	8.62	6.38	
	Cardiology	6.11	6.94	

* Mann-Whitney ** Kruskal-Wallis

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Table 3. Distribution of Probable Bipolar Disorder by Demographic Characteristics in Study Participants

Variable		Not Likely	Low	Medium	High	P-value*
Gender	Female	39(41.1)	46(59.7)	20(52.6)	2(20.0)	0.023
	Male	56(58.9)	31(40.3)	18(47.4)	8(80.0)	
Age Group	18 to 34 years	27(28.4)	37(48.1)	13(34.2)	3(30.0)	0.018
	35 to 49 years	34(35.8)	23(29.9)	19(50.0)	6(60.0)	
	50 to 65 years	34(35.8)	17(22.1)	6(15.8)	1(10.0)	
Marital Status	Single	27(28.4)	31(40.3)	11(28.9)	3(30.0)	0.382
	Married	68(71.6)	46(59.7)	27(71.1)	7(70.0)	
Income Level	No income	24(25.3)	30(39.0)	18(47.4)	4(40.0)	0.026
	Up to 5 million	22(23.2)	18(23.4)	6(15.8)	3(30.0)	
	5 to 10 million	28(29.5)	25(32.5)	12(31.6)	1(10.0)	
	More than 10 million	21(22.1)	4(5.2)	2(5.3)	2(20.0)	
Education	Below diploma	23(24.2)	15(19.5)	11(28.9)	3(30.0)	0.816
	Diploma	32(33.7)	26(33.8)	14(36.8)	2(20.0)	
	Diploma and above	40(42.1)	36(46.8)	13(34.2)	5(50.0)	
Occupation	Housewife	25(26.3)	28(36.4)	15(39.5)	2(20.0)	0.020
	Employee	24(25.3)	21(27.3)	9(23.7)	0(0.0)	
	Self-employed	26(27.4)	16(20.8)	13(34.2)	5(50.0)	
	Retired	5(5.3)	2(2.6)	0(0.0)	0(0.0)	
	Farmer	14(14.7)	6(7.8)	0(0.0)	1(10.0)	
	Unemployed	1(1.1)	4(5.2)	1(2.6)	2(20.0)	
Hospitalization Department	Internal Medicine	34(35.8)	33(42.9)	21(55.3)	4(40.0)	0.178
	Surgery	27(28.4)	28(36.4)	8(21.1)	4(40.0)	
	Cardiology	34(35.8)	16(20.80	9(23.7)	2(20.0)	

*Chi-squared test

Discussion

Bipolar disorder is one of the important causes of disability and leads to a large economic and social burden on the healthcare system. The prevalence of this disorder in non-psychiatric departments of hospitals is quite significant, and according to the National Hospital Discharge Survey (NHDS), there is an average annual increase of 10% in the discharge rate of bipolar patients [1]. Therefore, early screening and diagnosis can improve patient performance and reduce economic losses [18, 19].

Based on a previous study [17], individuals with a BSDS score of 13 or higher were considered positive cases. Our findings showed that among the 220 screened individuals, 48 (21.8%) had a positive result for the possibility of bipolar disorder. According to most population-based studies conducted so far, the lifetime prevalence of bipolar disorder in the general population is approximately 2-4% [10]. In bipolar disorder,

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dopamine and serotonin levels increase during mania and hypomania. Additionally, dopamine increase also occurs in medical diseases, suggesting that medical and bipolar disorders may share a common neurobiological etiology. Furthermore, the lifestyle of patients with bipolar disorder makes them more susceptible to medical diseases [3], and perhaps for these reasons, the frequency of bipolar disorder in the hospitalized population is higher than in the general population. In a previous study, the frequency of bipolar disorder in a general hospital in Tehran was found to be 1.27% in a sample of 207 individuals [1]. In another study, the frequency of bipolar disorder among 697 patients hospitalized in non-psychiatric hospitals in Tehran was evaluated using the BSDS and MDQ questionnaires, which was 12.1% based on the BSDS and 20.8% based on the MDQ, with a basis of 7.9% for both questionnaires [3]. In a systematic review, the frequency of bipolar spectrum disorder in population-based studies ranged from 2.4% to 15.1% [20]. One reason for the differences in frequencies observed across studies may be related to differences in sample size and study populations. On the other hand, the use of different tools to screen and measure the frequency of bipolar disorder may also explain the observed differences.

Based on the results of our study, the probability of bipolar disorder was higher in younger age groups (18-49 years compared to 50-65 years). In another study, the mean age of individuals with positive screening was significantly lower than that of those with negative screening [21]. In contrast to our study, another study found no significant difference in the frequency of bipolar disorder across different age groups [22]. However, this finding is generally consistent with the demographic findings of bipolar and mood disorders in psychiatric literature, suggesting that in this regard, hospitalized patients do not differ from the general population.

Our findings showed that the mean BSDS score was slightly higher in women than in men, but this difference was not statistically significant. Regarding the classification of bipolar disorder probability and its relationship with gender, a significant association was observed, with positive screening cases being more common in men than in women. In a previous study, the frequency of bipolar disorder in screening did not differ significantly between men and women [23]. However, in another study, the frequency of bipolar disorder was higher in male patients [3]. In general, most studies have shown no significant relationship between gender and the frequency of bipolar disorder. Differences in screening tools, measurement methods, and study populations may explain the discrepancies across studies. Additionally, different types of bipolar disorder were not distinguished in the present study, and if this distinction had been made, different results might have been obtained.

In our study, no significant relationship was observed between marital status and the mean BSDS score or the probability of bipolar disorder. Additionally, our findings showed that the mean BSDS score was higher in married women than in single women and lower in married men than in single men, but these differences were not significant. In a previous study, similar to ours, marital status had no significant effect on the probability of bipolar disorder in the adult population [24]. In another study, the frequency of bipolar disorder based on both the BSDS and MDQ questionnaires was significantly higher in single individuals than in married individuals [3]. One reason why our study, unlike most others, found no significant relationship between marital status and bipolar disorder may be the smaller sample size and the fact that there were fewer single than married individuals in our sample. Increasing the sample size might amplify the difference between married and unmarried individuals, making the relationship more significant.

Our results showed a significant relationship between income level and both BSDS score and the probability of bipolar disorder, such that individuals with higher income had lower mean BSDS scores, and the probability of bipolar disorder was higher in those with lower income. A previous study also observed that lower income was associated with a higher frequency of bipolar disorder [22]. Regarding the higher prevalence of bipolar disorder in individuals with lower income, possible explanations include socioeconomic stressors that may increase the risk of developing mood disorders. Individuals with lower incomes often experience higher levels of financial stress, limited access to mental healthcare, and less social support, all of which can contribute to the development and exacerbation of bipolar symptoms.

In our study, no significant relationship was found between education level and either BSDS score or the probability of bipolar disorder. One possible explanation is that educational attainment does not directly affect the neurobiological mechanisms underlying bipolar disorder. Additionally, other factors such as socioeconomic status or access to healthcare may have a more direct influence on the development and detection of the disorder than education level alone. In previous studies, similar to ours, no significant relationship was found between education level and the presence of bipolar disorder [23, 24].

We observed a significant relationship between employment status and the presence of bipolar disorder, such that unemployed individuals had higher

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mean BSDS scores and a higher probability of bipolar disorder. Previous studies have similarly observed that the probability of bipolar disorder is higher in unemployed individuals [19, 21]. Having a job may act as a protective factor against mood disorders by providing challenges, life diversity, and social and supportive relationships in the work environment. Furthermore, individuals with greater mental stability are more likely to remain in work environments, and in fact, these individuals constitute the majority of the working population.

Our findings showed that the mean BSDS score in patients admitted to internal medicine and surgery departments was significantly higher than in patients admitted to the cardiology department. A previous study observed that the frequency of bipolar disorder based on the BSDS in patients hospitalized in orthopedics, rheumatology, neurosurgery, and pulmonology departments was higher than in other departments [3]. Thus, consistent with our study, the frequency of bipolar disorder in internal medicine and surgery departments was higher than in the cardiology department. In our study, due to the small sample size, internal medicine and surgery departments were not analyzed separately for statistical analysis. One reason for the lower BSDS score in patients hospitalized in the cardiology department may be the higher mean age of these patients and the smaller number of patients hospitalized in that department.

Among the limitations of this study are the lack of differentiation between types of bipolar disorder (especially type I and II), screening by questionnaire without a clinical interview, and the lack of separation of internal medicine and surgery subsections in statistical analyses. The sample size in this study was smaller than that of most similar population-based studies. Additionally, due to the sampling method, the participants in this study were not representative of all patients with medical diseases. Furthermore some patients had difficulty understanding the questionnaires, and despite providing explanations, this problem may have affected the accuracy of the results.

Conclusion

The results of the present study showed that the frequency of bipolar disorder in patients hospitalized in non-psychiatric hospitals is significant and several times higher than in the general population. Additionally, the frequency of bipolar disorder was higher in younger age groups and among individuals with lower income and unemployment.

Given the impact of bipolar disorder on lifestyle, treatment adherence, disease course, and prognosis, identifying and treating this disorder in non-psychiatric hospitalized patients is essential. Worse socioeconomic conditions and younger age were associated with a higher frequency of bipolar disorder. Therefore, screening for this disease enables early diagnosis and timely treatment, thereby reducing its social and health burden on society.

Future studies should include larger sample sizes, conduct statistical analyses separately for all hospital departments, examine all types of bipolar spectrum disorders, and preferably use clinical interviews for screening. Additionally, the effect of patients' medications and the duration of hospital stay should be considered in future research.

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None.

Data availability

The corresponding author's dataset during the current study are available upon reasonable request.

Author's contribution

Conceptualization: A.H.., D.H.T., A.M.; Methodology: F.K.M., H.GH.; Sampling: F.K.M., A.M.; Statistical analysis and investigation: H.GH., M.S.; Writing – original draft preparation: A.M., F.K.M.; Writing - review and editing: A.H., M.S., D.H.T., and H.SH.

Conflicts of interest

All authors have no relevant financial interests to be declared.

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Ethical Statement

The research plan of this study was approved by the Research Ethics Committee of Babol University of Medical Sciences with code IR.MUBABOL.HRI.REC.1400.269. Not revealing the secrets and private issues of the patients, keeping the information obtained from them confidential and announcing the results of the research without mentioning names and personal details are considered.

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