Bipolar disorder among married women in Bangladesh: Survey in Rajshahi city

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Abstract

Background
Bipolar disorder (BPD) is a major mental disorder which not only affects the personal and social functioning of an individual, but also inflicts a huge economic burden on the family. Yet, the study of BPD in Bangladesh is rare and poorly documented. Responding to the dire need, we conducted a new study to determine the prevalence of, and detect the associated factors of, BPD among married women in Rajshahi City, Bangladesh.

Methods
We conducted a cross-sectional study, selecting households in Rajshahi City using a multi-stage random sampling design. The data consisted of 279 married women, who were screened for BPD using the bipolar spectrum diagnostic scale (BSDS). Frequency distribution, chi-square test and binary logistic regression model were used respectively to determine the prevalence, identify the associated factors and quantify their effects on BPD.

Results
The prevalence of BPD among married women in Rajshahi City was 2.5%, with an additional 7.2% classified as probable BPD. A binary logistic regression analysis established the following six main factors of BPD: (1) comorbid mental disorder [AOR = 8.232, 95% CI = (1.397, 50.000), p<0.05]; (2) poor relationship with husband [AOR = 11.775, 95% CI = (2.070, 66.667), p<0.01]; (3) poverty [AOR = 1.600, 95% CI = (2.086, 122.709), p<0.01]; (4) high educational level [AOR = 0.177, 95% CI = (0.037, 0.843), p<0.05]; (5) lack of immediate treatment if sick [AOR = 2.941, 95% CI = (1.259, 6.871), p<0.05]; and (6) death of beloved one/s [AOR = 2.768, 95% CI = (1.130, 6.777), p<0.05].
Limitations

Our survey involved self-reporting, which is typically affected by differing levels of understanding and bias. Also, a cross-sectional, observational study cannot establish an actual cause-and-effect relationship. Some other potentially important factors such as environment, lifestyle, familial customs, effects of drugs, treatment options and outcomes, etc. were not studied. Also, save mental disorder, all other comorbidities remained undocumented.

Conclusion

This study laid down the foundation for conducting further research on identifying different factors affecting BPD, and for studying other issues related to BPD among married women in Bangladesh. Among such factors are familial environment and culture, comorbidities, treatment options, treatment outcomes, biochemical feature, environmental factors, etc. This study also recommends that, while treating BPD patients, health professionals should focus on comorbidities and family matters.

Introduction

Bipolar disorder (BPD) is a major psychiatric illness characterized by fluctuations of mood. It disrupts the patient’s personal and social life; and it inflicts a huge economic burden on the family. Its prevalence varies between 0.2% and 6% [1–5] across different countries. In the bipolar spectrum form, its prevalence ranges from 2.6% to 7.8% [6]. A recent study conducted in 11 countries—mainly in the Americas, Europe and Asia—found a lifetime BPD prevalence of 2.4% [7]. BPD is the ninth leading cause of years-of-healthy-life-lost due to premature mortality and disability [8]. In 2004, BPD affected an estimated 29.5 million people worldwide [8]; and an estimated 0.9% of the total global burden of disease was attributed to BPD. In 2013, BPD accounted for 9.9 million disability-adjusted life-years (DALYs), or 0.4% of total DALYs and 1.3% of total years lived with disability [9].

BPD is a heritable illness [10, 11]. The first-degree relatives of a patient show a significantly higher rate of mood disorder and social cognitive deficits [12]. BPD prevalence also has a significant positive relationship with hypertension, dyslipidemia and diabetes [13]. Environmental factors influence its severity and clinical course [14]. Stressful life events, both in childhood and in adulthood, and alcohol or substance abuse affect the onset, recurrence and severity of BPD [15, 16]. Its incidence is increased by viral infection, substance abuse and trauma [17]. Common mental comorbidities of BPD include anxiety, substance abuse, conduct disorders, eating disorders, abnormal sexual behavior, attention-deficit/hyperactivity, impulse control, autism spectrum disorders, etc. Medical comorbidities are migraine, thyroid illness, obesity, type II diabetes and cardiovascular diseases [18].

BPD starts at age 18–22 years. It is common in both males and females, though the course of the disease in the two gender groups differs [19, 20]. Usually, women show a predominance of depression and mixed mania; and they commonly develop it at an older age with one or more physical comorbidities [21].

In Bangladesh, there have been some studies on general mental disorders. A few of these studies also investigated, though in a small scale, the prevalence of clinically diagnosed BPD along with other mental disorders [22, 23, 24]. Some other studies have been conducted on specific mental disorders such as depression [25, 26], schizophrenia [27], anxiety disorder
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[28], substance abuse disorder [29, 30], and obsessive-compulsive disorder [31]. To the best of our knowledge, no study has been done in Bangladesh exclusively on BPD—neither in the general population, nor among married women.

BPD causes long-lasting adverse effects on psycho-social functioning of the individual, and it generates negative financial implications causing intense suffering for the diseased individual. Moreover, in Bangladesh, wives and mothers play a major role in doing household works and rearing children. If they become sick, they cannot perform the duties efficiently. Consequently, the family is hurled into an abyss of suffering, and the country faces a great public health concern.

In light of above-mentioned adversities, our study was aimed at determining the prevalence of BPD among married women in Rajshahi City, Bangladesh, and at identifying the associated risk factors and quantifying their effects on BPD.

Materials and methods

We conducted a cross-sectional household study. All households in Rajshahi City constituted the population for this survey. We shall explain the sampling design in the next two paragraphs. From each selected household, one married woman was invited to respond to the survey. All selected married women were currently living with their husbands. The respondents' age ranged from 15 to 82 years.

Sample size determination

Rajshahi is one of the four big cities of Bangladesh having an area of 97.18 sq. km. and a total population of 4,48,087 [32]. The city is divided into 30 wards, which are further subdivided into muhallas (neighborhoods), and consist of 99,222 households. The mathematical formula 

\[ n = \frac{N}{1 + Nd^2} \]

was used to determine the sample size for this study [33], where 

- \( n \) = sample size,
- \( N \) = population size and
- \( d \) = margin of error.

Choosing \( d = 0.05 \), the formula indicated that \( n = 398 \) would suffice for this study. Assuming a 90% rate of response from the selected women, initially 450 married women were selected to participate in the study.

Sampling method

The survey participants were selected using a multistage random sampling (Fig 1). In the first stage, three wards were randomly selected out of the 30 wards of Rajshahi City, using a probability proportional to size sampling scheme. In the second stage, three muhallas were selected from each chosen ward by random sampling, again using a probability proportional to size sampling scheme. In the third stage, 50 households were selected from each chosen muhalla, using a simple random sampling. If the chosen household had only one married woman, she was invited to participate in the survey; otherwise, only one of the married women was chosen at random. All information about the number of households within each muhalla was collected from Rajshahi City Corporation Office. The randomizations were implemented by senior researchers.

Ethical approval

Before collecting data, ethical clearance for the study was taken from the Institutional Animal, Medical Ethics, Biosafety and Biosecurity Committee (IAMEBBC) for Experimentation on Animal, Human, Microbes and Living Natural Sources, Institute of Biological Sciences, University of Rajshahi, Bangladesh (Memo No: 120/320/IAMEBBC/IBSc, dated 11 April, 2019).
Data collection

For data collection, we used a semi-structured questionnaire, which was originally written in English and later translated into Bangla to help participants understand it easily. The first author prepared the first draft of the translation; subsequently, other authors reviewed and improved it. The final version of the questionnaire included the 20 questions (Questions 15–34) of the bipolar spectrum disorder scale (BSDS).

Three teams were trained to collect data; and one team was assigned to each of the three selected wards of the city. Each team consisted of one male and one female postgraduate student of the Department of Statistics, University of Rajshahi. The interviewers discussed the details of the research with the participants. A total of 96 women (slightly over 20%) declined to give any information. The remaining 354 agreed to provide information, and their written consent was taken. For respondents under 18 years old, consent of their guardians (family...
heads) was also taken (incidentally, although the legal minimum age of marriage in Bangladesh is 18 years for females, occurrence of child marriage is still very high [34, 35]). Fifty three responding women took the questionnaire with them, and asked the interviewers to collect it another day. Among them, 16 women failed to return their questionnaires. The survey was conducted at the respondents’ place of choice during the period May 15 through July 30, 2019.

When data were entered in a spread sheet, we detected some (59 married women) responses had one or more missing values; consequently, we excluded these respondents. Finally, complete responses from n = 279 married women were available for analysis. Thus, the achieved sample size fell short of the desired size of 398. Accordingly, the margin of error increased to d = 0.06.

**Outcome variable**

The outcome variable, BPD in married women, was determined using BSDS, which is an effective tool with sensitivity 0.76 and specificity 0.93 [36]. A study compared the diagnostic accuracy of several screening tools, and found that BSDS had the highest reliability (0.83) [37]. The BSDS was also used in developing countries such as Iran [38]. The score of points of the 20 questions ranged from 0 to 25 [39]. In this study, we classified our sample into three classes such as (i) no bipolar disorder (0–12 points), (ii) probable BPD (13–19 points) and (iii) BPD (20–25 points). However, as the prevalence of probable BPD and BPD were very low, these two classes were merged into one, and the combined class was simply called ‘BPD’. Thus, our respondents were classified into two categories, which were used for chi-square tests and binary logistic regression model.

**Independent variables**

Based on similar studies conducted in the past and keeping in view the objectives of our study, some socio-economic, demographic, anthropometric, familial and psycho-social factors were considered as independent variables in this study. The 23 independent variables were: age group, nutritional status, religion, respondent’s and their parents educational level, respondent’s occupation, type of family, number of family members, family’s monthly income, age at first marriage, duration of present conjugal life, miscarriage/abortions, death of children, number of children alive, number of marriage, comorbid stress/anxiety, relationship with husband, if sick treated immediately, comorbid chronic disease, family members’ chronic disease, comorbid mental disorder, blood relative’s mental disorder, and death of beloved one/s.

**Statistical analysis**

A frequency distribution was used to determine BPD prevalence. Chi-square test and binary logistic regression model were used respectively to detect associated significant factors and to measure their effects on BPD among married women in Rajshahi City, Bangladesh. The software SPSS (IBM, version 22) was used to analyze the data.

**Results**

The frequency distribution revealed that the prevalence of BPD, probable BPD and no BPD among married women in Rajshahi city, Bangladesh were 2.5%, 7.2% and 90.3% respectively (Fig 2).

Chi-square ($\chi^2$) tests identified the following ten variables as statistically significant factors associated with BPD among married women (Table 1): respondent’s education level, family’s monthly income, age at the first marriage, relationship with husband, if sick treated...
immediately, comorbid chronic disease, family members’ chronic disease, comorbid mental disorder, blood relative’s mental disorder and death of beloved one/s (Table 1).

Only significant factors (detected by chi-square test) were included as independent variables in the logistic model. Table 2 shows the results of the binary logistic regression model, which pronounced six of the ten factors as statistically significant in altering the odds of developing BPD. Women with comorbid mental disorder had eight times higher odds to develop BPD [AOR = 8.323, 95% CI = (1.397, 50.000), p < 0.05]. Women having poor relationships with their husbands had twelve times higher odds to have the disorder [AOR = 11.775, 95% CI = (2.070, 66.667), p < 0.01]. Women coming from poor families were 16 times more vulnerable to develop BPD than those from rich families [AOR = 16.000, 95% CI = (2.086, 122.709), p < 0.01]. Surprisingly, women with higher education had six times higher odds to have BPD than women with only primary education [AOR = 0.177, 95% CI = (0.037, 0.843), p < 0.05]. Women who were not treated immediately if sick showed about three times more chance to develop BPD [AOR = 2.941, 95% CI = (1.259, 6.871), p < 0.05]. Women whose beloved one/s died were about three times more vulnerable to have BPD than those who did not lose their dear ones [AOR = 2.768, 95% CI = (1.130, 6.777), p < 0.05] (Table 2).

Discussion

Our study aimed at determining the prevalence of bipolar disorder and its associated factors among married women in Bangladesh. For this purpose, a survey was conducted in Rajshahi...
City, Bangladesh. The prevalence of BPD found in this study was 2.5%, compared to 2.4% in 11 countries of the Americas, Europe, and Asia [7], 2.0% in England [40], 2.2% in Canada [41] and 1.2% in Singapore [42]. In our study, the prevalence of probable BPD was found to be 7.2%. Hence, the prevalence of BPD ranged from 2.5% to 9.7%, which is consistent with a global prevalence of 2.6% to 7.8% [6]. In comparison, the prevalence of BPD was estimated to be 8.6% in India [43] and 14.3% in Pakistan [44]. BPD prevalence is usually higher in urban environments than in rural areas [45]. This might also be a cause of the comparatively higher prevalence of BPD in our study, as all of our subjects came from urban areas. Such dissimilar findings necessitates conducting more studies either using the same scale and strategy, or using different scales and strategies.

Our study revealed that the women with comorbid mental disorder were eight times more prone to develop BPD, which is comparable to that found in other studies in Europe [3].

### Table 1. Chi-square test identify ten socio-economic, familial and psychological factors that have significant association with BPD among married women in Rajshahi City, Bangladesh.

| Variables                        | No BPD N (%) | BPD N (%) | $\chi^2$-value | p-value |
|----------------------------------|--------------|-----------|----------------|---------|
| **Respondent’s education level** |              |           |                |         |
| Uneducated, 37 (13.3)            | 35 (94.6)    | 2 (5.4)   | 7.029          | 0.040   |
| Primary, 98 (35.1)               | 92 (93.9)    | 6 (6.1)   |                |         |
| Secondary, 90 (32.3)             | 81 (90.0)    | 9 (10.0)  |                |         |
| Higher, 54 (19.3)                | 44 (81.5)    | 10 (18.5) |                |         |
| **Family’s monthly income**      |              |           | 12.679         | 0.002   |
| Poor, 84 (30.1)                  | 68 (81.0)    | 16 (19.0) |                |         |
| Middle, 133 (47.7)               | 124 (93.2)   | 9 (6.8)   |                |         |
| Rich, 62 (22.2)                  | 60 (96.8)    | 2 (3.2)   |                |         |
| **Age at the first marriage**    |              |           | 6.732          | 0.013   |
| <18 years, 117 (41.9)            | 112 (95.7)   | 5 (4.3)   |                |         |
| ≥18 years, 162 (58.1)            | 140 (86.4)   | 22 (13.6) |                |         |
| **Relationship with husband**    |              |           | 11.178         | 0.001   |
| Good, 103 (37.0)                 | 101 (98.1)   | 2 (1.9)   |                |         |
| Poor, 176 (63.0)                 | 151 (85.8)   | 25 (14.2) |                |         |
| **If sick treated immediately**  |              |           | 6.673          | 0.017   |
| No, 52 (18.6)                    | 42 (80.8)    | 10 (19.2) |                |         |
| Yes, 227 (81.4)                  | 210 (92.5)   | 17 (7.5)  |                |         |
| **Comorbid chronic disease**     |              |           | 14.938         | 0.001   |
| No, 150, (53.7)                  | 145 (96.7)   | 5 (3.3)   |                |         |
| Yes, 129 (46.3)                  | 107 (82.9)   | 22 (17.1) |                |         |
| **Family members’ chronic disease** |          |           | 15.112         | 0.001   |
| No, 178 (63.8)                   | 170 (95.5)   | 8 (4.5)   |                |         |
| Yes, 101 (36.2)                  | 82 (81.2)    | 19 (18.8) |                |         |
| **Comorbid mental disorder**     |              |           | 39.912         | 0.001   |
| No, 198 (71.0)                   | 193 (97.5)   | 5 (2.5)   |                |         |
| Yes, 81 (29.0)                   | 59 (72.8)    | 22 (27.2) |                |         |
| **Blood relative’s mental disorder** |          |           | 10.178         | 0.004   |
| No, 235 (84.2)                   | 218 (92.8)   | 17 (7.2)  |                |         |
| Yes, 44, (15.8)                  | 34 (77.3)    | 10 (22.7) |                |         |
| **Death of beloved one/s**       |              |           | 5.307          | 0.025   |
| No, 131 (47.0)                   | 124 (94.7)   | 7 (5.3)   |                |         |
| Yes, 148 (53.0)                  | 128 (86.5)   | 20 (13.5) |                |         |

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In this study, we also found that poor relationship with husband was an important factor affecting BPD among married women. Marital life sometimes becomes stressful and can trigger onset or relapse of mental illness such as BPD; on the other hand, marriage can also protect couples from mental disorders [48]. Hence, relationship with husband is a crucial issue: poor relation can either create or trigger mental disturbances; good relation can prevent mental illness. Nonetheless, we could not compare our finding with other studies as no other study included husband-wife relationship as a study variable.

Women from poor families were found more vulnerable to develop BPD than those from rich families, probably because poverty exposed the poor women continually to insecurity, anxiety and stress. A US study agreed that people with low family income were more vulnerable to BPD [49]. Another study observed that adult women of low socioeconomic status had twice the chance of developing mood disorders compared to middle- and high income groups [50].

Surprisingly, our study revealed that women with high education were more likely to have BPD than those with only primary education. A probable explanation for this may be that women with high education suffered from despair for not getting due recognition, power and honor within the family or in society— privilege their high educational status should have earned them. In fact, our observation matches a finding that BPD patients showed a higher likelihood to complete the highest level of education compared to their normal relatives [51]. On the other hand, a Norwegian study found that the association between educational level and BPD prevalence was not statistically significant, although social and occupational functioning was lower among BPD patients compared to healthy ones [52]. Furthermore, in our study, occurrence of BPD among uneducated women was not significantly different from that among women with higher education. Hence, we could not make any conclusive statement regarding the relationship between educational level and BPD occurrence.

Table 2. Effect of socio-economic, familial and psychological factors on BPD among married women in Rajshahi City, Bangladesh.

| Variable                        | B     | SE    | p-value | AOR*   | 95% CI** of AOR |
|---------------------------------|-------|-------|---------|--------|-----------------|
|                                 |       |       |         |        | Lower           |
|                                 |       |       |         |        | Upper           |
| **Comorbid mental disorder**    |       |       |         |        |                 |
| No vs YesR                      | -2.119| 0.910 | 0.020   | 0.120  | 0.020-0.716     |
| **Relationship with husband**   |       |       |         |        |                 |
| Good vs PoorR                   | -2.466| 0.887 | 0.005   | 0.085  | 0.015-0.483     |
| **Family’s monthly income**     |       |       |         |        |                 |
| Poor vs RichR                   | 2.773 | 1.039 | 0.008   | 16.000 | 2.086-122.709   |
| Middle vs RichR                 | 1.266 | 0.996 | 0.204   | 3.546  | 0.503-24.994    |
| **Respondent’s education level**|       |       |         |        |                 |
| Uneducated vs HigherR           | -1.524| 1.073 | 0.155   | 0.218  | 0.027-1.783     |
| Primary vs HigherR              | -1.730| 0.796 | 0.030   | 0.177  | 0.037-0.843     |
| Secondary vs HigherR            | -0.579| 0.679 | 0.394   | 0.561  | 0.148-2.120     |
| **If sick, treated immediately**|       |       |         |        |                 |
| No vs YesR                      | 1.079 | 0.433 | 0.013   | 2.941  | 1.259-6.871     |
| **Death of beloved one/s**      |       |       |         |        |                 |
| No vs YesR                      | -1.018| 0.457 | 0.026   | 2.768  | 1.130-6.777     |

R- Reference factor
*AOR- Adjusted Odds Ratio
**CI- Confidence Interval.

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Our study found that women who were deprived of getting immediate treatment if sick had a three times higher odds of developing BPD. No other study is available to compare this finding. We can say that such a situation probably breeds a sense of insecurity, agitation and irritation in these women.

Death of beloved one/s was found to be an important risk factor of BPD among married women. This issue is poorly documented in the literature: A study in Denmark found that parental death, especially maternal, increased the chance of BPD in their offspring [45]. Death of dear ones imprints on the human mind a long-lasting psychological effect; and that may be an explanation behind our finding.

Our study determined, for the first time in Bangladesh, the prevalence of bipolar disorder among married women; and it successfully identified some associated significant factors. However, this study also had some limitations. The self-reported responses to the BSDS questionnaire, being dependent predominantly on the respondents’ perceptions, may have been affected by differing levels of understanding and bias. Moreover, the cross-sectional observational study could not detect any actual cause-and-effect relationship. Comorbidities (chronic and mental disorders of the subjects and their blood-relatives) could not be accounted for. Also, some other important issues such as environmental factors, lifestyle, familial customs, effects of drugs, treatment options and outcomes, etc. could not be studied. Recognition of these limitations ought to propel the scientific community to implement new, more in-depth and elaborate research strategies.

Conclusions
The current study determined the prevalence of bipolar disorder and detected some associated risk factors of BPD among married women in Rajshahi City, Bangladesh. We found that 2.5% and 7.2% married women were suffering from BPD and probable BPD respectively. Among the significant risk factors were mental disorder, poor relation with husband, poverty, high educational level, lack of immediate treatment if sick and death of beloved one/s. As no other study on BPD has been conducted in Bangladesh, this current study has laid the foundation for further research regarding different aspects of BPD such as familial environment and culture, comorbidities, treatment options, treatment outcomes, biochemical picture, environmental factors, etc. Furthermore, based on our study, we recommend that health professionals focus on comorbidities and family matters while providing treatment and rehabilitation services to BPD patients. Government authorities and concerned nongovernmental and social organizations should take adequate steps to reduce repression on women and work for ensuring their rights and empowerment both at the household level and in society.

Supporting information
S1 Data.
(SAV)

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References

1. Baldessarini RJ, Tondo L, Vazquez GH, et al. Age at onset vs. family history and clinical outcomes in 1665 international bipolar-I disorder patients. World Psychiatry 2012; 11:40–46. https://doi.org/10.1016/j.wpsyc.2012.01.006 PMID: 22295008
2. Saarni SI, Viertio S, Perala J, et al. Quality of life of people with schizophrenia, bipolar disorder and other psychotic disorders. Br J Psychiatry 2010; 197:386–394. https://doi.org/10.1192/bjp.bp.109.076489 PMID: 21037216
3. Pini S, de Queiroz V, Pagnin D, et al. Prevalence and burden of bipolar disorders in European countries. Eur Neuropsychopharmacol 2005; 15:425–434. https://doi.org/10.1016/j.euroneuro.2005.04.011 PMID: 15935623
4. Hakkaart-van Roijen L, Hoeijenbos MB, Regeer EJ, et al. The societal costs and quality of life of patients suffering from bipolar disorder in the Netherlands. Acta Psychiatr Scand. 2004; 110(5):383–92. https://doi.org/10.1111/j.1600-0447.2004.00403.x PMID: 15458562
5. Mitchell PB, Slade T, Andrews G. Twelve-month prevalence and disability of DSM-IV bipolar disorder in an Australian general population survey. Psychol Med. 2004; 34:777–785. https://doi.org/10.1017/s0033291703001636 PMID: 1500298
6. Tohen M and Angst J. In: Textbook in Psychiatric Epidemiology, Tsuang MT, Tohen M, eds. New York: Wiley-Liss, 427–444, 2002.
7. Menikasas KR, Jin R, He JP, et al. Prevalence and correlates of bipolar spectrum disorder in the world mental health survey initiative. Arch. Gen. Psychiatry 2011; 68 (3):241–251. https://doi.org/10.1001/archgenpsychiatry.2011.21383262
8. World Health Organization. WHO Global Burden of Disease: 2004 Update. World Health Organization, Geneva, 2008.
9. Ferrari AJ, Stockings E, Khoo JP, et al. The prevalence and burden of bipolar disorder: findings from the Global Burden of Disease Study 2013. Bipolar Disord. 2016; 18(5):440–50. https://doi.org/10.1111/bdi.12423 PMID: 27566286
10. Coryell W, Scheftner W, Keller M, et al. The enduring psychosocial consequences of mania and depression. Am J Psychiatry 1993; 150:720–727 https://doi.org/10.1176/ajp.150.5.720 PMID: 8480816
11. Tohen M, Bromet E, Murphy JM, et al. Psychiatric epidemiology. Harvard Review of Psychiatry, 2000; 8(3):111–125 PMID: 10973936
12. American Psychiatric Association. Practice Guideline for the Treatment of with Bipolar Disorder, Second Edition. 2010; American Psychiatric Association, Washington, DC.
13. Bora E, McIntyre Roger S, Ozerdem Aysegil. Neurocognitive and neuroimaging correlates of obesity and components of metabolic syndrome in bipolar disorder: A systematic review. Psychological Medicine 2018; 49:1–12. https://doi.org/10.1017/S0033291718003252
14. Aldinger Fanny and Schulze Thomas G. Environmental factors, life events, and trauma in the course of bipolar disorder. Psychiatry and Clinical Neurosciences 2017; 71:6–17. https://doi.org/10.1111/pсен.12433 PMID: 27500795
15. Agnew-Blais J and Danese A. Childhood maltreatment and unfavorable clinical outcomes in bipolar disorder: a systematic review and meta-analysis. Lancet Psychiatry 2016; 3(4):342–9. https://doi.org/10.1016/S2215-0366(15)00544-1 PMID: 26873185
16. Claudia Lex, Eva Báznér, Meyer Thomas D. Does stress play a significant role in bipolar disorder? A meta-analysis. J Affect Disord. 2017; 208:298–308. https://doi.org/10.1016/j.jad.2016.08.057 PMID: 27794254

17. Marangoni C, Hernandez M, Faedda GL. The role of environmental exposures as risk factors for bipolar disorder: A systematic review of longitudinal studies. J Affect Disord. 2016; 15(193):165–74.

18. McElroy SL. Diagnosing and treating comorbid (complicated) bipolar disorder. J Clin Psychiatry 2004; 65 (Suppl 15):35–44.

19. Hirschfeld RMA, Bowden CL, Gitlin MJ, et al. Practice guideline for the treatment of patients with bipolar disorder (revision). Am J Psychiatry 2002; 159 (Suppl):1–35.

20. Suominen K, Mantere O, Valtonen H, Arvionmäki S, Isometsä E. Gender differences in bipolar disorder type I and II, Acta Psychiatrica Scandinavica 2009; 120(6):464–73. https://doi.org/10.1111/j.1600-0447.2009.01407.x PMID: 19476453

21. Saioa López-Zurbarano Ana González-Pinto, Purificación López. Gender Differences in Bipolar Disorder. Psychopathology in Women. 2014; 641–659.

22. Karim E, Alam MF, Rahman AHM, et al. Prevalence of Mental Illness in the Community. TAJ. 2006; 19 (1): 18–23.

23. Rabbani MG, Alam MF, Ahmed HU, et al. Prevalence of mental disorders, mental retardation, epilepsy and substance abuse in children. Bang J Psychiatry 2009; 23(1):1–54.

24. Mandal MC, Mullick SI, Nahar JS, et al. Prevalence of psychiatric ailments among patients with sexually transmitted disease. Mymensingh Med J. 2007; 16 (2 Suppl): S23–27. PMID: 17917626

25. Billah SMB and Khan FI. Depression among Urban Adolescent Students of Some Selected Schools. Faridpur Med. Coll. J. 2014; 9(2):73–75

26. Selim Nasima. Cultural Dimensions of Depression in Bangladesh: A Qualitative Study in Two Villages of Matlab. J Health Popul Nutr. 2010; 28(01):95–106

27. Mahmud MHS, Yeasmin B, Mandal S. Quality of life of schizophrenic patients in a tertiary care hospital in Bangladesh. Bang J Psychiatry 2015; 29(1):30–34

28. Sultan-E-Monzur M, Taher A, Roy S, Karim ME, Mollah AH. Major depressive disorder and generalized anxiety disorder among the patients with diabetes mellitus. Bang J Psychiatry 2015; 29(1):14–17

29. Shazzad MN, Abdul SJ, Majumder MSM, Sohel JUA, Ali SMM, Ahmed S. Drug Addiction in Bangladesh and its Effect. Medicine Today. 2013; 25 (02).

30. Islam A and Hossain MF. Drug abuse and its impact on Bangladesh. Int. J. Sociol. Anthropol. 2017; 9 (11):143–156

31. Ahmed F, Begum M, Wahab MA, Ahmed SK. Quality of life of patients with obsessive compulsive disorder Bang J Psychiatry 2015; 29(1):18–22

32. Bangladesh Bureau of Statistics (BBS). Statistical Pocket Book Bangladesh 2016. Bangladesh Bureau of Statistics. Dhaka, 2017.

33. Rana M, Sayem A, Karim R, et al. Assessment of knowledge regarding tuberculosis among non-medical university students in Bangladesh: a cross-sectional study. BMC Public Health 2015; https://doi.org/10.1186/s12889-015-0271-0 PMID: 26215721

34. Ministry of Women and Child Affairs, Government of the People’s Republic of Bangladesh. The child marriage restraint act, 2017 (Act no. VI of 2017). Retrieved 2019-12-07. Available from https://www.unicef.org/bangladesh/sites/unicef.org.bangladesh/files/2018-10/Child%20Marriage%20Restraint%20Act%202017%20English.pdf

35. UNICEF. Child Marriage is a Death Sentence for Many Young Girls. (PDF). UNICEF. 2012. Retrieved 2019-12-07. Available from https://www.unicef.org/sowc09/docs/SOWC09-CountryExample-Mali.pdf

36. Ghaemi SN, Miller CJ, Berv DA, et al. Sensitivity and specificity of a new bipolar spectrum diagnostic scale. J Affect Disord. 2005; 84: 273–277. https://doi.org/10.1016/S0165-0327(03)00196-4 PMID: 15708426

37. Imamura K, Kawakami N, Naganuma Y. Development of screening inventories for bipolar disorder at workplace: A diagnostic accuracy study. J Affect Disord. 2015; 178: 32–38. https://doi.org/10.1016/j.jad.2015.02.034 PMID: 25795533

38. Shabani A, Mirzaei-Khoshalani M, Mahdavi S, Ahmadzad-Asl M. Screening bipolar disorders in a general hospital: Psychometric findings for the Persian version of mood disorder questionnaire and bipolar spectrum diagnostic scale. Med J Islam Repub Iran. 2019; 33:48. https://doi.org/10.34171/mjiri.33.48 PMID: 31456972

39. BSDS. 2013. Psychiatric Times UBM Medica, LLC. 11. Available from https://physicians.utah.edu/echo/pdfs/the-bipolar-spectrum-diagnostic-scale.pdf.
40. Tobias A. Rowland and Steven Marwaha. Epidemiology and risk factors for bipolar disorder. Ther Adv Psychopharmacol. 2018; 8(9): 251–269. https://doi.org/10.1177/2045125318769235

41. Schaffer A, Cairney J, Cheung A, et al. Community Survey of Bipolar Disorder in Canada: Lifetime Prevalence and Illness Characteristics. Can J Psychiatry 2006; 51:9–16. https://doi.org/10.1177/070674370605100104 PMID: 16491979

42. Chong SA, Abdin E, Vaingankar JA, et al. A population-based survey of mental disorders in Singapore. Ann Acad Med Singapore 2012; 41(2):49–66. PMID: 22498852

43. Shenoy SK and Praharaj SK. Borderline personality disorder and its association with bipolar spectrum and binge eating disorder in college students from South India. Asian J Psychiatr. 2019; 44:20–24. https://doi.org/10.1016/j.ajp.2019.07.017 PMID: 31302438

44. Iqbal, et al. Prevalence of vulnerability for bipolar spectrum disorder among students of Pakistan. JABS. 2014; 1(2): 3–8.

45. Tsuchiya KJ, Byrne M and Mortensen PB. Risk factors in relation to an emergence of bipolar disorder: a systematic review. Bipolar Disord. 2003; 5: 231–242. https://doi.org/10.1034/j.1399-5618.2003.00038.x PMID: 12895201

46. Merikangas KR, Akiskal HS, Angst J, et al. Lifetime and 12-month prevalence of spectrum disorder in the National Comorbidity Survey replication. Arch Gen Psychiatry 2007; 64:543–552. https://doi.org/10.1001/archpsyc.64.5.543 PMID: 17485606

47. Ranga Rama Krishnan K. Psychiatric and Medical Comorbidities of Bipolar Disorder. Psychosomatic Medicine 2005; 67:1–8. https://doi.org/10.1097/01.psy.0000151489.36347.18 PMID: 15673617

48. Grover S, Nehra R, Thakur A. Bipolar affective disorder and its impact on various aspects of marital relationship. Ind Psychiatry J 2017; 26:114–20. https://doi.org/10.4103/ipj.ipj_15_16 PMID: 30089956

49. Bauer M, Glenn T, Rasgon N, et al. Association between median family income and self-reported mood symptoms in bipolar disorder. Compr Psychiatry 2011; 52(1): 17–25. https://doi.org/10.1016/j.comppsych.2010.04.005 PMID: 21220061

50. Lana JW, Sharon LB, Margaret JH. Area-based socioeconomic status and mood disorders: Cross-sectional evidence from a cohort of randomly selected adult women. Maturitas 2011; 69(2):173–178 https://doi.org/10.1016/j.maturitas.2011.03.015 PMID: 21514078

51. Vreeker A, Boks MPM, Abramovic L, et al. High educational performance is a distinctive feature of bipolar disorder; a study on cognition in bipolar disorder, schizophrenia patients, relatives and controls. Psychol Med. 2016; 46(4): 807–818. https://doi.org/10.1017/S0033291715002299 PMID: 26621616

52. Schoeyen HK, Birkenaes AB, Vaaler AE, et al. Bipolar disorder patients have similar levels of education but lower socio-economic status than the general population. J Affect Disord. 2011; 129(1–3):68–74. https://doi.org/10.1016/j.jad.2010.08.012 PMID: 20832866