

PREVALENCE AND POTENTIAL ETIOLOGIES OF BIPOLAR DISORDER AMONG FEMALES OF REPRODUCTIVE AGE

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ABSTRACT

Background: Bipolar disorder (BPD) is a major psychiatric problem characterized by fluctuation of mood disrupts of the effected person and disturb the social and personal life that create a big socioeconomic burden for the family. Objective of current study was to calculate the prevalence and potential etiologies of bipolar disorder among females of reproductive age.

Methods: An analytical cross-sectional study was conducted on 218 females of reproductive age (15-44) years who were selected from the general population of Gujarat, Pakistan. Those females who were reported or diagnose with schizophrenia, taking medicine for any psychiatric condition were excluded. A standard questionnaire, Bipolar Spectrum Disorder Scale (BSDS) for the diagnosis of bipolar disorder. Data were entered and analyzed using SPSS, version 24.00 at 95% confidence interval. Chi-Square test and Binary Logistic Regression model were applied for association.

Results: Average age of 218 females was 29.08 ± 6.87 years, 96(44.04%) participants had BMI $>25\text{kg/m}^2$. Active smoking ; OR=6.612(3.09-14.12), manic episodes ; OR=2.971(1.41-6.24), depression; OR=2.282(1.09-4.76), history of physical trauma; OR=6.164(2.89-13.17), history of emotional trauma; OR=3.823(1.82-8.03), comorbidity ;OR=4.231(2.01-8.91), sleep disturbance; OR= 2.730 (1.27-5.85)were found statistical significant with $p\text{-value} < 0.001$ and potential risk factors.

Conclusion: Prevalence of bipolar disorder among females of reproductive age was found high. Active smoking, manic episodes, depression, history of physical trauma, history of emotional trauma, comorbidity, pregnancy or obstetric complications and sleep disturbance were potential etiologies of bipolar disorder.

Keywords: prevalence, etiologies, bipolar disorder, reproductive age, Bipolar Spectrum Disorder Scale

INTRODUCTION

Bipolar disorder (BD) is a chronic mood disorder which is also known as a manic illness because it is characterized by mania and hypomania episodes and due to the episode of depression. In the events of life, when dealing with different life situations, mood swings are common. However, if these mood swings are persistent and severe it can cause thinking impairment and distress. Bipolar disorder can be a root cause of cognitive and functional which leads to the decline in quality of life.¹

Women are more affected with bipolar disorder in later age of life than men. Women are more frequently face illness in later phase (45-50 years). A major concern about women disorder is delay in treatment, about 11 years from onset of disease till start of treatment, because of fail to proper diagnose. On other hands male delay treatment up to 7 years.²

In women Bipolar disorder is prominent for rapid cycling, which involve 4 years or episodes. This may relate with comorbid effect of gonadal steroid, hypothyroidism and use of antidepressant.³ Moreover, cyclic mood fluctuation and seasonally pattern are recognized in women as hormones fluctuate during reproductive life.⁴

Worldwide 1% of population is affected with bipolar disorder. General lifetime prevalence of bipolar disorder I is 0.6%, for bipolar disorder II account for 0.4%, sub-threshold appearance is 1.4% for bipolar disorder and for broader spectrum bipolar disorder is 2.4%.⁵ Few studies indicate higher rates. According to DSM report, 12 months prevalence of bipolar disorder I is 1.5% and for lifelong prevalence is 2.1%. The beginning of bipolar disorder is liberated from nationality, socioeconomic condition and ethnicity. Bipolar disorder I prevalence are equal in women and men, but bipolar disorder II are higher in women.⁶

According to global burden of disease, bipolar disease is the 17 leading factor after anxiety, depression, dysthymia and schizophrenia. In studies of global burden of disease, mental disorder account for 32% years of disability lived life while 13% years accounts for adjusted disability life of all disorder.⁷ Age, psychiatric (Obesity, Physical and sexual abuse,) and medical co-morbidities.⁸ Mental health of human was ignored area and only few studies were found or limited knowledge was found. This study was conducted to calculate the prevalence and to assess the etiologies of bipolar disorder in female of reproductive age (15-43) years.

METHODS

Study design, setting and study population

An analytical cross-sectional study was conducted. Data were collected from healthy community of Gujarat, Punjab, Pakistan. Females of reproductive age (15-44)⁸ who were selected from the general population of Gujarat. August, 2022 to November, 2022 was the duration of study.

Sample size calculation, sampling technique and sample selection criteria

Below maintained formula was used to calculate sample size of cross sectional study

$$n = (Z_{1-\alpha/2})^2 P (1-P) / d^2$$

$Z_{(1-\alpha/2)}$ = standard normal variate =1.96 at 95% confidence level , $P=14.30\%=0.143$ was proportion or prevalence of bipolar disorder that was taken from pilot study whereas $d=5\%=0.05$, marginal of error or effect size $n=189$ was calculate and added with 15%(29) dropout, total sample size that was proposed 218. Non-probability convenient sampling technique was used to select the females of reproductive age. A sample of 218 reproductive females were selected who were fulfilled the bases criteria of inclusion and exclusion. Female of reproductive age 15-44 years who could obey verbal commands⁹ were selected for study population. Whereas, Those females who were reported or diagnose with schizophrenia , taking medicine for any psychiatric condition⁹ were excluded. Females who could not communicate, willing and providing completed information they were also excluded from the study.

Data collection tool and outcome measure

A standard questionnaire, Bipolar Spectrum Disorder Scale with specificity=0.80 and sensitivity = 0.76 was used to diagnose the bipolar disorder. A pilot study was also conducted to assess the internal reliability of self-structured questionnaire for risk factors that was found reliable with Cronbach's Alpha=0.761

Ethical consideration

This study was approved by institutional review board (IRB) of University of Lahore. Oral and written informed consent was taken from all selected females. Before data collection they were informed that their information kept confidential and anonymous throughout the study

and they would be free to withdraw at any time during the study. All participants would be volunteer and their identity would not be revealed in results during publication.

Data collection Procedure

Females of reproductive age (15-44) years were selected by non-probability convenient sampling. Participants were included after taking informed and written consent according to inclusion and exclusion criteria. Individuals were informed about whole study procedure and the purpose of the study. A pilot study was conducted to assess the internal reliability of self-structured questionnaire this tool was found reliable with Cronbach's Alpha=0.761 and sample size calculation was also done by this pilot study. Questionnaire had two sections, in 1st section, demographic variables like age, weight, height, body mass index, marital status, and socioeconomic status were included and in 2nd section 13 items were included, from which information of risk factors related bipolar disorder.

A tool Bipolar Spectrum Disorder Scale (BSDS) was used to diagnose the bipolar disorder; in which total score was between 0-25. In between 0-6, 7-12, 13-19 and 20-25 score categories indicated highly unlikely, low probability, moderate probability and high probability of bipolar disorder respectively. Score 13 and above was optimum threshold for positive diagnosis and considered positive for bipolar disorder.

Statistical Analysis

Data were entered and analyzed using statistical package for Social Sciences (SPSS) software version 24.00. For descriptive analysis, mean and standard deviation were calculated for quantitative continues variables whereas frequency and percentages were calculated for qualitative variables. For inferential statistics, Chi-Square test and Binary Logistic Regression model were applied for the association and strength of association by adjusted and non-adjusted odds ratio (OR). All results were calculated at 95% confidence interval and P-value ≤ 0.05 was considered as a significant value.

RESULTS

A sample of 218 females of reproductive age (15-44) were selected by nonprobability convenient sampling. Average age of female was 29.08 ± 6.87 years, 96(44.04%) participants were with BMI $>25\text{kg/m}^2$, approximately 50% were unmarried, 146(67%) were with family

income >40 thousand and having good socioeconomic status that is shown in **Table 1**. Prevalence of bipolar disorder in females of reproductive age was observed 16.97% that is presented in **Figure 1**.

Table 1. Demographic characteristics of study participants

Characteristics	Unite/Responses	n(%)
Age of participants	Years, mean (S.D)	29.08(6.87)
Body Mass Index (Kg/m²)	<18 (Underweight)	34 (15.60)
	18-24 (Normal Weight)	88(40.37)
	25-29 (Overweight)	67(30.73)
	>29 (Obese)	29(13.30)
Marital status	Single	112(51.38)
	Married	97(44.50)
	Divorce	9(4.13)
Socioeconomic status	Very Poor	29(13.30)
	Poor	39(17.89)
	Good	150(68.81)
Monthly Family income (PKR) in Thousand	<20	16(7.34)
	20-40	56(25.69)
	40-60	142(65.14)
	>60	4(1.83)
Total		218(100)

Associated risk factors and etiologies are displayed in Table 2. Active smoking (p-value<0.001, OR=6.612(3.09-14.12), manic episodes (p-value=0.004, OR=2.971(1.41-6.24), depression (p-value=0.025, OR=2.282(1.09-4.76), history of physical trauma(p-value<0.001, OR=6.164(2.89-13.17)history of emotional trauma (p-value<0.001, OR=3.823(1.82-8.03), comorbidity (p-value<0.001, OR=4.231(2.01-8.91) and sleep disturbance(p-value<0.009, OR= 2.730 (1.27-5.85)were assessed as potential risk factors and had statistical significant difference whereas pregnancy or obstetric complications; p-value<0.008, OR=0.263(0.09-0.76) was a deterrent factor for bipolar disorder that are shown in **Table 2**.

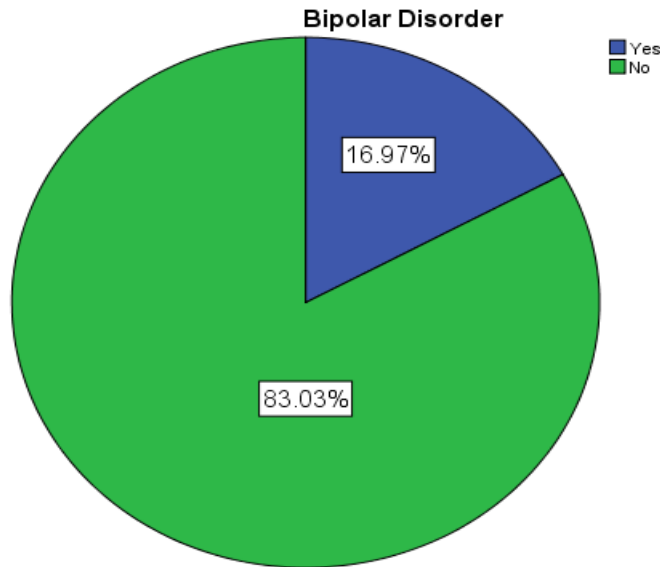


Figure 6. Prevalence of bipolar disorder in females of reproductive age

Table 2. Associated risk factors of bipolar disorder

Association		Bipolar Disorder		P-Value	95% Confidence Interval
		Yes=37	No=181		
		n(%)			OR(LL-UL)
Active smoking	Yes	21(56.80)	30(16.60)	<0.001*	6.612(3.09-14.12)
	No	16(43.20)	151(83.40)		
Passive smoking	YES	26(70.30)	121(66.90)	0.676	1.171(0.54-2.53)
	NO	11(29.70)	60(33.10)		
Manic episodes	YES	16(43.20)	37(24.10)	0.004*	2.971(1.41-6.24)
	NO	21(56.80)	14479.60)		
Depression	Yes	24(64.90)	81(44.80)	0.025*	2.282(1.09-4.76)
	No	13(35.10)	100(55.20)		
History of physical trauma	Yes	20(54.10)	29(16.00)	<0.001*	6.164(2.89-13.17)
	No	17(45.90)	152(84.00)		
History of emotional trauma	Yes	24(64.90)	59(32.60)	<0.001*	3.823(1.82-8.03)
	No	13(35.10)	122(67.40)		
Any kind of family issues	Yes	12(32.40)	86(47.50)	0.089	0.532(0.25-1.12)
	No	25(67.60)	95(52.50)		
Comorbidity	Yes	24(64.90)	55(30.40)	<0.001*	4.231(2.01-8.91)
	NO	13(35.10)	126(69.60)		
Pregnancy or Obstetric Complications	Yes	4(10.80)	58(32.00)	0.008*	0.263(0.09-0.76)
	No	33(89.20)	123(68.00)		
Sleep disturbance	Yes	26(70.30)	84(46.40)	0.009*	2.730(1.27-5.85)
	No	11(29.70)	97(53.60)		

“OR” indicates the Odds Ratio, “LL” Lower Limit, “UL” Upper Limit, “*” Indicates the statistically significant difference

DISCUSSION

Current study was conducted on 218 females of reproductive age (15-40) years to calculate the prevalence and potential etiologies of bipolar disorder. Prevalence of bipolar disorder was found 37(16.97%) of total population, it shows that, approximately every sixth reproductive female was suffered with BPD that is very high prevalence as compare to a meta-analysis review¹⁰, difference in prevalence is not clear but may be COVID-19 had effected the population or in this meta-analysis includes the both male and female both but in this current study, reproductive female was selected as study population. But, it is need to conduct more and detailed study for the conformation of BPD.

Current study showed that active smoking and passive smoking was significant and potential risk factor to develop the bipolar disorder similar to a previous study¹¹. Participants with manic episodes had time more risk to develop the BPD as compare to without manic episodes that was statistically significant risk factor that showed the same trend a case control study¹¹ but opposite to previous published population based cohort study¹². Comorbidity factor was also shown as a risk factor like in past an epidemiological study on bipolar disorder¹⁰. This study revealed that pregnancy or obstetric complications was positively associated with BPD and present study was shown the similar trend to a systematic review¹³, where as a registry-based study stated a reduced risk in pregnancy for first psychiatric admissions with both bipolar disorder and schizophrenia¹⁴. Bipolar disorder was assessed frequent in women during pregnancy as compare to schizophrenia, even though some epidemiological prospective researchers has published with this trend.¹³ Few community based researches had revealed that pregnancy was rather protective with low rate in both at start and decline during pregnancy¹⁵ and in 2013, a follow up study¹⁶ noted that out of 980, eight percent women were conformed bipolar I disorder in the beginning of their pregnancy. On the other hand, a clinical study was found with conflict, according to this study¹⁷, high relapse rate was present during pregnancy, especially in those females who suspended prophylactic medication, 53 (85%) out of total 62 females). In a study¹⁸ with same group in an expanded sample of parous women with bipolar disorder (n=283 BPI and n=338 BPII) noted that 23% had illness episodes during pregnancy compared with 52% with an episode in the post-partum period.

Depression, History of physical trauma and sleep disturbance were newly test risk factors that were significantly associated with BPD. It is needed to test and verify these factors through case controls study.

Limitations

In limitations, this study was conducted on only females that were using non-probability that could cause of selection bias. A questionnaire based diagnostic of bipolar disorder was done that is totally based on patients, which could create wrong diagnosis of bipolar disorder.

CONCLUSION

Prevalence of bipolar disorder among females of reproductive age was observed high. Active smoking, manic episodes, depression, history of physical trauma, history of emotional trauma, comorbidity, pregnancy or obstetric complications and sleep disturbance were potential etiologies for bipolar disorder. Proper attention of concerned departments and health care authorities is needed. Future studies are recommended for the prevention and to control the bipolar disorder.

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