Asian Journal of Psychiatry 44 (2019) 20–24

Contents lists available at ScienceDirect

Asian Journal of Psychiatry

journal homepage: www.elsevier.com/locate/ajp

Borderline personality disorder and its association with bipolar spectrum and binge eating disorder in college students from South India

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ARTICLE INFO

Keywords:
Borderline personality disorder
Bipolar spectrum disorder
Binge-eating disorder
College students

ABSTRACT

Background: Borderline personality disorder (BPD) usually emerges during adolescence and is associated with severe morbidity. Individuals with BPD are also vulnerable to develop eating disorders as well as mood disorders.
Objective: To study the prevalence of borderline personality and its association with binge-eating and bipolar spectrum disorder in college students.
Methods: A questionnaire based survey was conducted on a convenience sample of 500 college students (> 18 years of age) in medical and engineering campus. Participants were screened on self-report measures including McLean Screening Instrument for BPD (MSI-BPD), Mood Disorder Questionnaire (MDQ) and Binge-Eating Disorder Screener (BEDS-7) for BPD, bipolar spectrum disorder (BSD) and binge-eating disorder (BED), respectively.
Results: The prevalence of BPD was 76 (15.2%, 95% CI 12.3–18.6), BSD was 43 (8.6%, 95% CI 6.4–11.5) and BED was 48 (9.6%, 95% CI 7.2–12.6). There was a significantly higher proportion of BSD (OR 23.6, 95% CI 11.3–49.3) and BED (OR 3.4, 95% CI 1.8–6.5) among those with BPD than those without.
Conclusions: BPD was found in 15% of adolescents and they have higher proportion of BED and BSD. Early identification may help in planning early intervention strategies to reduce associated morbidity.

1. Introduction

Borderline personality disorder (BPD) is a complex and serious psychiatric disorder affecting approximately 0.7–5.9% of the general population (Swartz et al., 1990; Lenzenweger et al., 2007). It is a devastating mental illness that centers on the inability to manage emotions effectively. The symptoms include: fear of abandonment, impulsivity, rage, bodily self-harm, suicide, and chaotic relationships. There is a high rate of attempted suicide and approximately 10% of adults with BPD commit suicide (Skodol et al., 2002). The symptoms lead to impairment in psychosocial functioning and high rates of mental health treatment utilization (Bender et al., 2001). It is known that BPD is underdiagnosed in most clinical settings, which can lead to delay in starting appropriate treatment or sometimes, lead to unnecessary treatment.

Personality disorder has its origins in childhood and adolescence, however, diagnosing personality disorder before 18 years is difficult considering evolving nature of the disorder. Recent studies found that borderline personality and mood disorders in youth can be diagnosed with more certainty (Newton-Howes et al., 2015). BPD is recognizable early in life, evolves continuously across the lifespan, and is more plastic than previously believed. BPD or symptoms of borderline personality in young people is associated with high morbidity and potentially poor outcomes. BPD independently predicts current psychopathology, poor general functioning, poor self-care, and poor relationships with family, peers, and significant others (Chanen et al., 2007; Kaess et al., 2012). In a community-based sample of children and adolescents, the prevalence of borderline personality disorder was 11% at age 9–19 years and 22% at 15–25 years (Bernstein et al., 1993). BPD is more common in women than in men (about 70% and 30%, respectively) (Widiger and Weissman, 1991).

Individuals with BPD are also vulnerable to develop eating disorders like binge-eating episodes followed by self-harm demonstrated through induced vomiting or other purging behaviors as well as mood disorders. The most common personality disorder in bulimia nervosa was borderline personality disorder, with a prevalence rate of 28% (Sansone and Sansone, 2011). Binge-eating disorder (BED) is characterized by recurrent episodes of binge eating accompanied by feeling a lack of

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https://doi.org/10.1016/j.ajp.2019.07.017
Received 26 March 2019; Received in revised form 7 July 2019; Accepted 7 July 2019

control and marked distress over one's eating behaviors. It has been found that BED is a serious condition that impairs health-related quality of life and increases health care costs (Ágh et al., 2015). BED has been linked with several comorbid health conditions, including diabetes, hypertension, stroke, and heart disease, and other psychiatric illnesses such as anxiety and depression (Kessler et al., 2013). Effective treatments for BED have the potential to reduce the burden of BED on patients and the health care system.

Bipolar disorder has its onset in youth; 70% of individuals experience their first symptoms before age 25, with the peak onset at age 17 (Lish et al., 1994). Both in BPD and bipolar disorder, symptoms appear from puberty through to young adulthood. They frequently co-occur, can reinforce one another, and can be difficult to differentiate clinically. Several studies have found subthreshold symptoms prior to onset of syndromal bipolar disorder, which are identified in retrospect (Bechdolf et al., 2012). Delay in the diagnosis of bipolar disorder can lead to neuroprogression, poor psychosocial adjustment and increased rates of hospitalization for episodes, at least in a subset of patients.

There is a paucity of studies that looked at prevalence rates of BPD in Indian population. Pinto et al. (2000) carried out the first study on BPD in India; they found 17% suicide attempters presenting to hospital had borderline personality disorder. The prevalence of such symptoms in nonclinical Indian population is not known. We aimed to study prevalence of borderline personality and its association with binge-eating and bipolar spectrum disorder in college students. The objective was to study the prevalence of borderline personality, binge-eating and bipolar spectrum disorder (BSD) in college students using self-report measures. The second objective was to study the association between BPD with BSD and BED, and their association with socio-demographic variables.

2. Methods

2.1. Participants

This was an epidemiological questionnaire based survey conducted from April 2017 to September 2017 in Department of Psychiatry, Kasturba Medical College, Manipal, Karnataka. The study was approved by the Institutional Ethics Committee. Sample consisted of 500 students (250 were medical students and 250 were engineering students). Convenience sampling was used. Estimated sample based on 20% prevalence, 95% confidence interval and 5% precision for infinite sample was 246. Eligibility criteria was all college students (medical and non-medical) above 18 years of age and giving written informed consent.

2.2. Tools

The sociodemographic details were collected on a proforma designed for the study. *McLean Screening Instrument for Borderline Personality Disorder* (MSI-BPD; Zanarini et al., 2003), a 10-item instrument was used to screen for DSM-IV borderline personality disorder. Each question is scored as yes (1) or no (0), the total score is 10. A cut off score of 7 has good sensitivity (0.81) and specificity (0.85) in adults. The sensitivity (0.90) and specificity (0.93) are higher in young adults aged 25 years or less.

The 15-item *Mood Disorder Questionnaire* (MDQ; Hirschfeld et al., 2000) was used for screening bipolar spectrum disorder. It has a sensitivity of 0.73 and a specificity of 0.90 in psychiatric settings. However, in a general population the sensitivity was 0.28 and specificity 0.97 (Hirschfeld, 2002, 2003). Question 1 consists of 13 items enquiring about whether the patient feels they have been their usual self, specifically about their levels of energy, of self-confidence and irritability etc. Question 2 enquires if several of the items in Question 1 have occurred at the same time. Question 3 asks about how much of a problem the symptoms have been in work/social life/relationships. The studies have showed MDQ was best at screening bipolar I disorder and less sensitive to bipolar II disorder and bipolar not otherwise specified disorders.

Binge-Eating Disorder Screener (BEDS-7; Herman et al., 2016), a brief, patient-reported 7-item screening tool was used which is designed to identify individuals with probable binge-eating disorder. It has a very high sensitivity (100%) and a specificity of 38.7%, which makes it a good screening tool, and confirm to the DSM-5 criteria (Herman et al., 2016). Based on the psychometric properties it has been suggested to be useful beyond the clinical settings.

2.3. Procedure

All students who met with the inclusion criteria were enrolled in the study. Participant information sheet was provided and written informed consent was obtained from the participants. Socio-demographic data was collected using the data sheet provided to the participants for self-report. All participants were screened on McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD), Mood Disorder Questionnaire (MDQ), and Binge-Eating Disorder Screener (BEDS-7). Data collection was carried out by the first author, either in the class or outside the class within the campus.

2.4. Statistical analysis

Data obtained were analysed Statistical Package for the Social Sciences (SPSS) for Windows, version 16.0, Chicago, SPSS Inc. Descriptive statistics (percentage, mean and standard deviation) were used primarily to summarize and describe the data. Reliability analysis (Cronbach's α) was carried out for all the three scales, which was interpreted using the

tiered approach of George and Mallery (2003), i.e. ≥ .9 Excellent, ≥.8 Good, ≥.7 Acceptable, ≥.6 Questionable, ≥.5 Poor, and ≤.5 Unacceptable. Pearson's correlation analysis was done for linear relationship between BPD, MDQ and BED total scores. The proportion of BPD, bipolar spectrum disorder and BED with 95% confidence intervals (Wilson method) were calculated using EpiTools epidemiological calculators (Brown et al., 2001). Pearson's chi square test was used to examine the group differences in the categorical variables. Odds ratio (OR) and 95% confidence interval were calculated according to Altman (1991) using MedCalc software.

3. Results

The sample characteristics are summarized in Table 1. The mean age of the sample was 19.9 (SD 1.9) years. There were 52.6% females in the sample. Majority of the sample were from nuclear family (83.6%) and middle socioeconomic status (85.8%). The Cronbach's α for MSI-BPD and BEDS-7 were 0.802 and 0.887, respectively, which is

Table 1
Sample characteristics.

		Mean (SD)
Age		19.9 (1.9)
Education years		14.8 (2.4)
		n (%)
Gender	Male	237 (47.4)
	Female	263 (52.6)
Family	Nuclear	418 (83.6)
	Joint	82 (16.4)
Socioeconomic status	Lower	8 (1.6)
	Middle	429 (85.8)
	High	63 (12.6)
Habitat	Rural	207 (41.4)
	Urban	293 (58.6)
Stream	Medical	250 (50)
	Engineering	250 (50)

Table 2
Association of borderline personality disorder with bipolar spectrum and binge-eating disorder and the differences across gender and stream.

	With BPD N = 76	Without BPD N = 424	p	OR (95% CI)
Bipolar spectrum disorder, n(%)	31 (40.8)	12 (2.8)	< .0001*	23.6 (11.3, 49.3)
Binge-eating disorder, n(%)	17 (22.4)	33 (7.8)	.0002*	3.4 (1.8, 6.5)
Gender	**Male N = 237**	**Female N = 263**	**p**	**OR (95% CI)**
BPD, n(%)	36 (15.2)	40 (15.2)	.995	1 (0.6, 1.6)
Bipolar spectrum disorder, n(%)	24 (10.1)	19 (7.2)	.249	1.4 (0.8, 2.7)
Binge-eating disorder, n(%)	19 (8)	31 (11.8)	.162	0.6 (0.3, 1.9)
Stream	**Medical N = 250**	**Engineering N = 250**	**p**	**OR (95% CI)**
BPD, n(%)	45 (18)	31 (12.4)	.081	1.5 (0.9, 2.5)
Bipolar spectrum disorder, n(%)	30 (12)	13 (5.2)	.007*	2.5 (1.3, 4.9)
Binge-eating disorder, n(%)	23 (9.2)	27 (10.8)	.551	0.8 (0.5, 1.5)

* $p < .05$.

considered 'good', and for MDQ it was 0.771, which is 'acceptable' (George and Mallery, 2003). Among the students, the prevalence of BPD using MSI-BPD was 76 (15.2%) with 95% CI (12.3 to 18.6%). The prevalence of possible BSD was 43 (8.6%) with 95% CI (6.4 to 11.5%). The prevalence of BED was 48 (9.6%) with 95% CI (7.2 to 12.6%).

The proportion of BSD and BED among young adults with BPD is summarized in Table 2. There was a significantly higher proportion of BSD among those with BPD than those without (40.8 vs 2.8%) (OR 23.6, 95% CI 11.3–49.3). Also, there was significantly higher proportion of BED among those with BPD than those without (22.4 vs 7.8%) (OR 3.4, 95% CI 1.8–6.5). BPD total scores correlated significantly positively with MDQ total score ($r = 0.649$, $p < .001$) and BED total score ($r = 0.459$, $p < .001$). MDQ total score correlated significantly positively with BED total score ($r = 0.351$, $p < .001$).

The proportion of BPD was equal across gender (15.2%). The proportion of BSD was higher among males (10.1%) as compared to females (7.2%); however, the difference was not statistically significant ($p = .248$). The proportion of BED was higher among females (11.8%) as compared to males (8%); however, the difference was not statistically significant ($p = .162$).

There was no difference in proportion of BPD, BSD or BED across family type and habitat. A higher rate of BPD was seen in those from lower SES (37.5%), as compared to middle (14.2%) and upper (19%); however, the difference was not statistically significant ($p = .095$). Similarly, a higher rate of BSD was seen in those from lower SES (37.5%), as compared to middle (7.5%) and upper (12.7%); the difference was statistically significant ($p = .014$). There was no difference in rates of BED across SES.

There was higher proportion of BPD among medical students (18%) as compared to engineering students (12.4%); the difference was not statistically significant ($p = .081$). There was significantly higher proportion of BSD among medical students as compared to engineering students (12% vs 5.2%) ($p = .007$, OR 2.5, 95% CI 1.3–4.9). There was no difference in rates of BED across the two streams. The mean age and education years was higher in those with BPD and BSD, whereas, there was no relationship with BED.

4. Discussion

Prevalence of BPD in our study, using MSI-BPD was 15.2% (95% CI 12.3 to 18.6%), which was similar to the study by Chanen et al. (2008). This was much lower than the Zanarini et al. (2003) study that found 69.5% participants meeting the criteria for BPD. The reason for higher prevalence could be because they recruited subjects through advertisements. Also, the mean age of Zanarini et al. (2003) sample was 33.6 (SD 11.1), which was much higher than our sample (mean age 19.9, SD 1.9) and 18.8 (SD 2.8) years in Chanen et al. (2008) sample. In a meta-analysis of 43 studies the prevalence of BPD in college samples ranged from 0.5% to 32.1%, with lifetime prevalence of 9.7% (95% CI 7.7 to 12%) (Meaney et al., 2016). Our findings are similar to the Pinto et al. (2000) study in which 17% suicide attempters presenting to hospital had BPD. Also, another hospital-based study (Gupta and Mattoo, 2012) from North India reported 25.4% sample had emotionally unstable personality disorder, of which 18.7% had BPD.

The older studies have found BPD to be more common among females (up to 76%); however, this could be because of sampling bias (Silberschmidt et al., 2015). There was no gender difference in the rates of BPD in our sample, which was similar to most of the epidemiological studies (Lenzenweger et al., 2007; Grant et al., 2008), in contrast to female preponderance in clinical samples (Silberschmidt et al., 2015). One possible reason could be because of higher rates of hostility and other symptomatology such as depression and anxiety in females with BPD, thus increasing treatment seeking and bias in clinical samples (Silberschmidt et al., 2015). In contrast, males with BPD may present with symptoms of antisocial personality or substance abuse (Tadić et al., 2009) and are missed in clinical sample. Indeed, one epidemiological survey in UK found higher rates of BPD in males (Coid et al., 2006).

The prevalence of possible BSD in our sample was 8.6% (95% CI 6.4 to 11.5%). The rate of BSD using MDQ in the general population ranged from 2% to 17.7% (Zimmerman and Galione, 2011). Another study on Korean college students reported the prevalence of BSD using MDQ to be 18.6% (95% CI 16.2 to 21%) (Bae et al., 2013). There were slightly higher rates of BSD in males which is similar to Bae et al. (2013) study. The wide variations in the prevalence rates using MDQ could be because of very low sensitivity in general population, as compared to psychiatric settings (Hirschfeld et al., 2003). In a meta-analysis of 21 studies on diagnostic accuracy of MDQ, the summary sensitivity was 0.62 and summary specificity was 0.85 with the cutoff value of 7, and the overall diagnostic accuracy was found to be relatively good (Wang et al., 2015). Indeed, MDQ positivity is associated with poorer quality of life, which supports the hypothesis that it may reliably pick up subthreshold bipolarity or BPSD (Carta et al., 2015).

The prevalence of BED was 9.6% (95% CI 7.2–12.6%) in our sample, which was similar to 9.6% of the subjects having binge eating episodes in Portugal (Ribeiro et al., 2014). Another study in Brazil found 12.9% of university students having BED (Nicoli and Junior, 2011). However, a prevalence rate of 0.5% for BED was found in Ribeiro et al. (2014) study in second phase. Thus, the screening instruments overestimates the actual prevalence rates. Nevertheless, BEDS-7 was reported to be valuable and easy to use screener by most of users (Herman et al., 2017).

There were significantly higher rates of BSD in students screening positive for BPD (more than 40%). In previous studies approximately

20% of BPD patients had bipolar disorder (Zimmerman and Morgan, 2013). It has been argued that borderline personality symptoms are part of bipolar spectrum; however, this has been challenged recently (Zimmerman and Morgan, 2013). BPD scores correlated with MDQ scores in our sample with a large effect size. A recent meta-analysis found that comorbidity of BPD with bipolar disorder is common, with approximately one in five people experiencing a comorbid diagnosis (Fornaro et al., 2016). In another large epidemiological survey lifetime prevalence of BPD was 29% in bipolar I disorder and 24% in bipolar II disorder (McDermid et al., 2015).

BED in those with BPD was 22.4%, which was similar to 29% in the study by Zanarini et al. (2003). BPD scores correlated with BED scores in our sample with a medium effect size. In the 10 year follow up study examining the course of eating disorder in BPD it was found that remissions are common and diagnosis may change over a period of time (Zanarini et al., 2003). BED scores correlated with MDQ scores in our sample with a medium effect size. This is consistent with the reported relationship between eating disorder and mood disorders, including unipolar depression and bipolar spectrum disorder (McElroy et al., 2005; Araujo et al., 2010; Khairallah et al., 2019).

The strengths of our study includes use of validated measures in a large sample of college students to estimate prevalence rates. The diagnosis was not confirmed after the screening phase which is a limitation of the study; therefore, the reported prevalence rates could be overestimation of true rates. Also, the study sample was limited to medical and engineering students which is not representative of all the college students.

4.1. Conclusions

The prevalence rates of borderline personality disorder in the young adults was 15% in South India. There were high rates of comorbid bipolar spectrum disorder and binge-eating disorder with borderline personality. Identifying these disorders early opens up possibility of early intervention strategies to reduce morbidity associated with these conditions.

Funding source

The first author received Short Term Studentship (STS) fund in 2018 from Kasturba Medical College (KMC), Manipal, India for carrying out this project.

Acknowledgment

None.

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