Research Paper

Prevalence and Socio-Demographic Factors of Bipolar Mood Disorders in Children and Adolescents: Identifying the Principal Predictors

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ABSTRACT

Objectives: Our objective is to measure the prevalence of bipolar mood disorder (BMD) in Iranian children and adolescents and its comorbidity with psychiatric disorders. Also, the main purpose of this study is to characterize the main risk factors for BMD in children and adolescents.

Methods: This is an analytical cross-sectional study. In a community-based study, we sampled 1000 children and adolescents from the age of 6 to 18 years in each province via the multistage cluster sampling method. The total valid sample size reached 29 812 cases. The instructed clinical psychologists completed the Persian version of the kiddie schedule for affective disorders and schizophrenia present and lifetime version (K-SADS-PL). Furthermore, the demographic data were obtained. To analyze the data, descriptive statistics, multinomial, and multiple logistic regressions were utilized to evaluate the relationships.

Results: The total prevalence rates for BMD were 0.29%; it was 0.26% in males and 0.29% in females. BMD rates were larger in children and adolescents whose mothers had an occupation. Also, after controlling the effective variables (sex and age), location (rural or urban), the father's education, and the psychiatric hospitalization of the mother or the father, none predicted BMD significantly. Moreover, patients with comorbidities showed a superior prevalence compared to those without comorbidities, ranging from 1.96% for posttraumatic stress disorder to 39.22% for the oppositional defiant disorder.

Conclusion: BMD was more prevalent among women. The gender or the father's education level was not the risk factor for BMD symptoms. Several factors, such as maternal education and maternal job were also important for the prevalence of BMD symptoms.

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Highlights

- There is statistically significant gender differences for bipolar disorders in children and adolescents.

- The evaluation rate of prevalence of bipolar disorders and their comorbidities, may help to prevent bipolar disorders in children and adolescents.

Plain Language Summary

This study highlights the main predictors of bipolar mood disorders in Iranian children and adolescents. The research design also allowed a better understanding of predictors of bipolar disorders. The Appraisal of the prevalence of bipolar disorders, particularly their comorbidities, may help to prevent mental illnesses in children and adolescents.

1. Introduction

Bipolar mood disorder (BMD) is a chronic relapsing-remitting illness, characterized by episodic mania (excessive self-esteem, extravagant activity, reduced need for sleep) and depression [1]. BMD is a multifactor disorder with an unknown etiology [2]. Based on the Diagnostic and Statistical Manual of Mental Disorders (fourth edition, text revision) (DSM-IV-TR), there are two main types of bipolar disorder: type I and type II. BMD types I and II account for about 2% of the general population worldwide [3]. The diagnostic criteria for BMD mentioned in the DSM-5 are similar to those provided in the DSM-IV-TR [4].

The prevalence of this disease has been reported in various surveys and research. Accordingly, the lifetime prevalence of BMD ranges from 2.6% to 7.8%. Another study also stated that the annual incidence of BMD is lower than 1%.

Childhood is an important phase in life that forms a person's personality. Nevertheless, it may be accompanied by psychological issues affecting a child's development as well as their family. BMD type I is a psychiatric illness that might begin during childhood; it involves a severe and chronic psychiatric disorder. Previous studies demonstrated a growing increase in the detection of BMD among the young population [5].

The age of onset is an important issue for BMD, and is influenced by comorbid anxiety disorders. The mean age for the first appearance of BMD in individuals without anxiety disorders was reported to be 19.4 years. Whereas, BMD patients with anxiety disorders encountered the first affective episode at 15.6 years [6]. This finding concurs with several longitudinal BMD-offspring studies, suggesting that main symptoms are associated with depression in early adolescence before the age of maximum incidence of mania, whereas not specific psychopathology, such as anxiety and attention deficit hyperactivity disorder (ADHD) are often found during childhood [7, 8]. Similarly, depression symptoms could be dependable antecedents of BMD in high-risk youths, which have previously been related to a particular clinical level in the clinical staging structure of BMD [9, 10].

A study proved that family conditions could increase the incidence of BMD, for example, in children with fatherly drug abuse or motherly depression symptoms, as well as in children experiencing poor connection with their parents, along with children who have a conflict in the family [11]. The risk of suicide is higher because of the psychological pathology of the parents and their suicidal behavior [12]. All of these studies demonstrate that larger rates of psychopathology are found in parents of children suffering from BMD, whereas maternal and paternal issues could have different values [13].

Comorbidity is the co-occurrence of several illnesses with separate etiologies [14, 15]. Some studies suggest that anxiety disorders can be the most common psychiatric comorbidity among people with BMD [16-20]. Furthermore, anxiety comorbidity results in a critical risk for subjects with BMD. Based on the literature, comorbidity of an anxiety disorder and BMD aggravates the disease's symptoms [21, 22]. Also, the co-existence of substance use disorder with BMD increases the hospitalization period [23]. However, Henri and his colleagues reported contradictory findings which indicated that co-occurrence of anxiety disorders was not linked to the severity of BMD and the period of hospitalization [24]. Concurrent anxiety disorders and substance use disorder raise the disability, chronicity,

and mortality of BMD. Comorbidity of anxiety disorders with BMD for panic disorder, social phobia, obsessive-compulsive disorder, posttraumatic stress disorder, and generalized anxiety disorder (GAD) were 10.6%-62.5%, 7.8%-42.5%, 3.2%-35%, 7%-37.8%, and 32.7%, respectively [6].

Epidemiological surveys have shown that the lifetime prevalence of obsessive-compulsive disorder in BMD subjects ranges from 3.2% to 35% [6, 17, 25]. It is shown that the comorbidity of anxiety disorders with BMD is related to some clinical and demographic features of patients. In other words, comorbidity of anxiety disorders is more prevalent in male individuals with early onset of BMD and poor educational attainment. In these patients, response to psychotropic medicines is not good and the presence of mixed episodes of disorder and psychotic episodes, as well as prevalence of suicide attempts and substance use are high [6, 26].

Previous studies in offspring with BMD have shown that ADHD could not be a good antecedent of BMD, except young patients with high familial risks for psychosis and neurodevelopmental deficiencies [27].

Multicenter epidemiological surveys are necessary to evaluate the epidemiological factors and prevalence as well as to design efficient plans for the prevention and detection of BMD in youths. However, there are no studies that evaluate the epidemiological factors in such a statistical population. Childhood and adolescence form a very important developmental period in which affective disorders may emerge [28] if we can detect them, they can be treated more effectively in this period. Such data will be useful for health policies.

Accordingly, the present study evaluates a great sample size of children and adolescents residing in Iran. The Iranian child and adolescent psychiatry (IRCAP) study utilized a well-designed research methodology to evaluate and identify the major factors of BMD in youths. We conducted a cross-sectional survey for three purposes: 1) to estimate the prevalence of BMD; 2) to provide the comorbidity states in youths with BMD; and 3) to predict the BMD symptoms by gender, age and other socio-demographic parameters, principal predictors, such as maternal and paternal education and comorbid disorders as the prevalence of mental disorders in children is higher compared to previous reports in Iran [28]. Such research in this field seems necessary.

2. Materials and Methods

Study Participants and procedures

we utilized the data gathered from the IRCAP study, a national survey evaluating mental disorders in youths, social capital, parental personality, and lifestyles. Our national study was confirmed by the National Institute for Medical Research Development (NIMAD) and the Research Ethics Committee of NIMAD. A brief explanation about the survey was presented to the subjects and they were notified that involvement in the research is voluntary and they can withdraw from the study. The data were gathered from 30 provinces of Iran (n=30 546) through a 3-stage cluster sampling method and valid responses totaled 29 812. We randomly chose the study samples for every province from individuals 6 to 18 years of age. The data was gathered through 170 blocks that were randomly selected through national postal codes. Then, from every cluster head, the subjects were chosen; 6 cases consisted of 3 students from both gender in 3 age groups (i.e., 6-9, 10-14, and 15-18 years). Subjects were recruited from both urban and rural areas in all provinces proportionally.

All children and adolescents from the age of 6 to 18 years with Iranian citizenship were eligible to participate in the study. On the other hand, the exclusion criteria were having a restriction or disability that prevented the proper completion of questionnaires, such as acute developmental disease, learning disability, severe psychosis symptoms, or inability to speak and read the Persian language.

Study Measurements

We collected the data via the following tools:

Socio-demographic form

This form was prepared according to the survey goals and consisted of information, such as age, gender, location (rural or urban), parent's medical records, parent's level of education, parent's career status, and so on.

Kiddie Schedule for Affective Disorder and Schizophrenia The kiddie schedule for affective disorders and schizophrenia (K-SADS-PL) is a semi-structured diagnostic interview that evaluates current and past episodes of psychiatric illnesses according to the DSM-IV-TR. With proper and practical training before evaluating the subjects, the interviewers included M.Sc. and Ph.D. students of clinical psychology, and postbaccalaure-

ate researchers. They had enough experience in child and adolescent psychiatric evaluation. In addition, they were carefully instructed to perform the interviews and evaluations of this research. To do this, 250 clinical psychologists were trained through a 5-day workshop. They learned how to execute the diagnostic interview, manage the scores, and draw conclusions about the overall outcome. This workshop comprised of presentations, role-playing, interviews, and discussions with actual patients. All these training workshops were administered by the study's first author in every province.

Subjects and their parents were separately interviewed and interviewers obtained a summary score according to their best appraisal clinical assessment. This work used depression diagnoses (meeting the criteria for sub-threshold depression) were used for the analyses. Sub-threshold depression comprised of depressive episodes remaining for 24 weeks with three to four symptoms, or depressive episodes with at least five symptoms that remained for 1 to 2 weeks. The inter-rater reliability according to 120 pairs of ratings (10 interviews with 24 total diagnoses, rated by 5 interviewers) was κ=0.85 [29].

In prior research, the validity and reliability of the Persian version were found to be sufficient. The consensual validity of anorexia nervosa was 0.49. There were appropriate inter-rater reliability and external validity (test-retest), a good to superior specificity, sensitivity, as well as positive and negative predictive validity for almost all of the disorders [30].

Study procedure

The interviewers encouraged families to complete the questionnaires and to permit their offspring to participate in the survey. K-SADS-PL was conducted by two interviewers to detect psychiatric problems for 30 to 40 min.

We used the IBM SPSS software, version 24, to conduct inferential and descriptive analyses. The multiple logistic regression and odds ratio (OR) analyses were conducted to specify which factors throughout patient groups were the main predictors of BMD. P<0.05 (2-sided) were considered significant.

3. Results

Descriptive analysis for different parameters and demographic information is summarized in Table 1. The Mean±SD age of the subjects was 11.8±3.78 years. Most subjects (34.9%) were in the age range of 10 to 14 years and 83.5% resided in urban areas. Regarding the educational level of mothers, 44.28% had 0-12 years of school or no diploma, 33.1% had a high school education (diploma), 5.49% had associate degrees, and 17.13% had a bachelor's degree or higher.

Regarding the educational level of fathers, 42.92% had 0-12 years of school or no diploma, 29.13% had a high school education (diploma), 6.75% had associate degrees, and 2.12% had a bachelor's degree or higher.

The prevalence rates of BMD were 0.26% in males and 0.29% in females, respectively. Findings also indicated that the prevalence of BMD for subjects residing in urban and rural areas were 0.29 % and 0.15%, respectively (Table 2). Also, the results showed that the rate of BMD is higher in children and adolescents than in working mothers.

Table 2 indicated the findings obtained from the regression analysis. The results of this analysis demonstrated that the incidence of BMD increased with age until it reached its maximum in the age range of 15 to 18 years (OR=6.73; 95% CI=2.89-15.66) (Table 2 and Figure 1). Based on the logistic regression, the subjects whose parents benefited from higher education (diploma or more) (OR=5.33; 95% CI=1.86-15.23 and OR=3.24; 95% CI= 1.18-8.90) were more likely to be identified with BMD than subjects whose parents did not hold a diploma; that is, the higher education level in the mother necessarily predisposes a person to suffer from BMD.

Based on the regression analysis, after controlling for the effects of important parameters, such as location (rural or urban citizen), the father's education, sex (male or female), and psychiatric hospitalization in the mother or the father, none could predict BMD significantly.

Furthermore, developmental disorders and psychosis were not involved in the analysis models, since several subjects suffered from these illnesses.

In addition, subjects with comorbidities showed a larger prevalence compared to those with no comorbidities, ranging from 1.9% for posttraumatic stress disorder and encopresis to 39.22% for the oppositional defiant disorder (Figure 1 and Table 3).

Figure 2 showed the raising tendency of BMD by age trends and sex group; in other words, the age ranges of 16-18 and 6-9 years had the highest and the lowest prevalence of BMD, respectively.

Table 1. Socio-demographic characteristics for study sample participated in the national survey of psychiatric disorders in Iranian children and adolescents

Socio-Demographic		Characteristics	No. (%)
Gender	Boy		14598(48.85)
	Girl		51214(51.15)
Age	6-9		10155(34.29)
	10-14		10427(34.90)
	15-18		9230(30.81)
Types of settlement	Urban		24854(83.50)
	Rural		4958(16.50)
Father's educations	0-12 years of school, no diploma		12328(42.92)
	Diploma or equivalent		8344(29.13)
	Associate degree		1934(6.75)
	Bachelor's degree or more		6098(2.12)
	Missing		1108
Mother's educations	0-12 years of school, no diploma		12842(44.28)
	Diploma or equivalent		9604(33.11)
	Associate degree		1591(5.49)
	Bachelor's degree or more		4968(17.13)
	Missing		807
Psychiatric hospitalization or psychotherapy	Father	No	29340(98.57)
		Yes	426(1.43)
		Missing	46
	Mother	No	29228(98.22)
		Yes	527(1.78)
		Missing	57
Father's Job	Employed	Public sector	9298(32.25)
		Private sector	18475(64.32)
		Unemployed	993(3.43)
		Missing	1046
Mother's job	Employed	Public sector	3089(10.57)
		Private sector	1214(4.19)
		Housewife	24810(85.24)
		Missing	699
Total			29812

Table 2. Distribution of BMD based on socio-demographic characteristics in Iranian children and adolescents

Variables	With BMD			Regression Logistic Model	
	No. (%unweighted)		%Weighted (CI95%)	Univariate	Multivariate
	Socio-demographic Characteristics			OR (CI95%)	OR (CI95%)
Gender	Boy	27 (0.18)	0.26 (0.18-0.39)	Baseline	
	Girl	27 (0.18)	0.29 (0.20-0.42)	1.09 (0.63-1.88)	1.13 (0.64-1.97)
Age	6-9	9 (0.09)	0.11 (0.05-0.23)	Baseline	
	10-14	17 (0.16)	0.18 (0.10-0.31)	1.71 (0.66-4.44)	1.69 (0.64-4.44)
	15-18	28 (0.30)	0.60 (0.43-0.84)	5.90 (2.55-13.64)**	6.73 (2.89-15.66)
Types of settlement	Urban	44 (0.18)	0.29 (0.22-0.38)	Baseline	
	Rural	10 (0.20)	0.15 (0.05-0.43)	0.48 (0.15-1.59)	0.72 (0.15-1.37)
Father's educations	0-12 years of school, no diploma	22 (0.18)	0.19 (0.11-0.32)	Baseline	
	Diploma or equivalent	14 (0.17)	0.40 (0.27-0.60)	2.09 (1.07-4.07) *	1.44 (0.65-3.19)
	Associate degree	3 (0.16)	0.41 (0.18-0.96)	2.23 (0.82-6.10)	1.19 (0.38-3.70)
	Bachelor's degree or more	10 (0.16)	0.20 (0.10-0.40)	1.01 (0.42-2.44)	0.46 (0.15-1.37)
	Missing	5			
Mother's educations	0-12 years of school, no diploma	23 (0.18)	0.18 (0.10-0.31)	Baseline	
	Diploma or equivalent	14 (0.15)	0.27 (0.17-0.43)	1.53 (0.75-3.11)	1.63 (0.71-3.75)
	Associate degree	3 (0.19)	0.75 (0.38-1.47)	3.94 (1.61-9.67)**	5.33 (1.86-15.23) **
	Bachelor's degree or more	11 (0.22)	0.32 (0.18-0.57)	1.84 (0.83-4.08)	3.24 (1.18-8.90) **
	Missing	3			
Psychiatric hospitalization or psychotherapy	Father – No	52 (0.18)	0.27 (0.20-0.36)	Baseline	
	Father – Yes	2 (0.47)	0.44 (0.08-2.44)	1.90 (0.31-11.88)	1.67 (0.28-10.81)
	Father – Missing	-	-		
	Mother – No	51 (0.17)	0.27 (0.20-0.36)	Baseline	
	Mother – Yes	3 (0.57)	0.29 (0.05-1.61)	1.55 (0.30-8.02)	1.74 (0.33-9.26)
	Mother – Missing	-			
Father's Job	Employed – Public sector	17 (0.18)	0.31 (0.20-0.49)	=0.569, df=2 , P=0.699	
	Employed – Private sector	31 (0.17)	0.27 (0.19-0.38)		
	unemployed	2 (0.20)	0.16 (0.03-0.90)		
	Missing	4			
Mother's job	Employed – Public sector	8 (0.26)	0.45 (0.24-0.85)	=7.097, df=2, P=0.029	
	Employed – Private sector	3 (0.25)	0.64 (0.27-1.49)		
	Housewife	41 (0.17)	0.23 (0.17-0.32)		
	Missing	2	-		
Total		54 (0.18)	0.29 (0.22-0.38)		

Table 3. Comorbidity of psychiatric disorders in children and adolescents with BMD obtained through national survey of psychiatric disorders in Iranian children and adolescents

Psychiatric Disorders		No. (%) Unweighted)	%Weighted (CI95%)
Psychotic disorders	Psychotic symptoms	2(3.70)	5.88 (2.02-15.92)
Anxiety disorders	Panic disorder	2(3.70)	5.88 (2.02-15.92)
	Separation anxiety disorder	10(18.52)	15.69 (8.17-28.01)
	Social phobia	3(5.56)	5.88 (2.02-15.92)
	Specific phobia	5(9.26)	11.76 (5.50-23.38)
	agoraphobia	5(9.26)	11.76 (5.50-23.38)
	Generalized anxiety disorder	8(14.81)	9.80 (4.26-20.97)
	Obsessive-compulsive disorder	12(22.22)	29.41 (18.71-43.00)
	Posttraumatic stress disorder	2(3.70)	1.96 (0.35-10.30)
Total anxiety disorders		23(42.59)	47.06 (34.05-60.48)
Behavioral disorders	Attention deficit hyperactivity disorder	12(22.22)	11.76 (5.50-23.38)
	Conduct disorder	13(24.07)	21.57 (12.49-34.63)
	Oppositional defiant disorder	21(38.89)	39.22 (27.03-52.92)
	Tic disorder	4(7.41)	7.84 (3.09-18.5)
Total behavioral disorders		26(48.15)	45.10 (32.27-58.62)
Substance abuse disorders	Tobacco use	11(20.37)	27.45 (17.11-40.95)
	Alcohol abuse	1(1.85)	5.88 (2.02-15.92)
Elimination disorders	Enuresis	5(9.26)	7.84 (3.09-18.50)
	Encopresis	1(1.85)	1.96 (0.35-10.30)
Total elimination disorders		5(9.26)	7.84 (3.09-18.50)
Total comorbid disorders		35 (64.81)	72.55 (59.05-82.89)

BMD: bipolar mood disorders.

Iranian Rehabilitation Journal

4. Discussion

This study is a population-based survey to explore the prevalence of BMD among Iranian children and adolescents. It demonstrated that the prevalence rates of BMD were 0.29% in males and 0.26% in females, respectively, and the rate of total prevalence was 0.29%.

Two studies on BMD in adolescents reported that the prevalence rate of diagnosable BMD did not reach 6%. [31, 32]. Another study also stated that in approximately 1% of adolescents who were diagnosed with BMD I the rates would reach approximately 6% if subsyndromal symptoms of bipolar were included [33]. Another study stated that the mean prevalence of childhood BMD was 1.8% in the general population [34]. Dusetzina et al. (2012) reported that the prevalence of BMD in youths is between 0.24% and 0.26% in 2005-2007, respectively, and approximately a quarter of diagnoses were for children below 13 years [35]. An investigation on the prevalence of BMD revealed that a lifetime prevalence of BMD was between 1.06% and 1.57% for BMD I and BMD II [36]. Other investigations have found a higher prevalence of mania and BMD I in males and higher rates of BMD II in females [3].

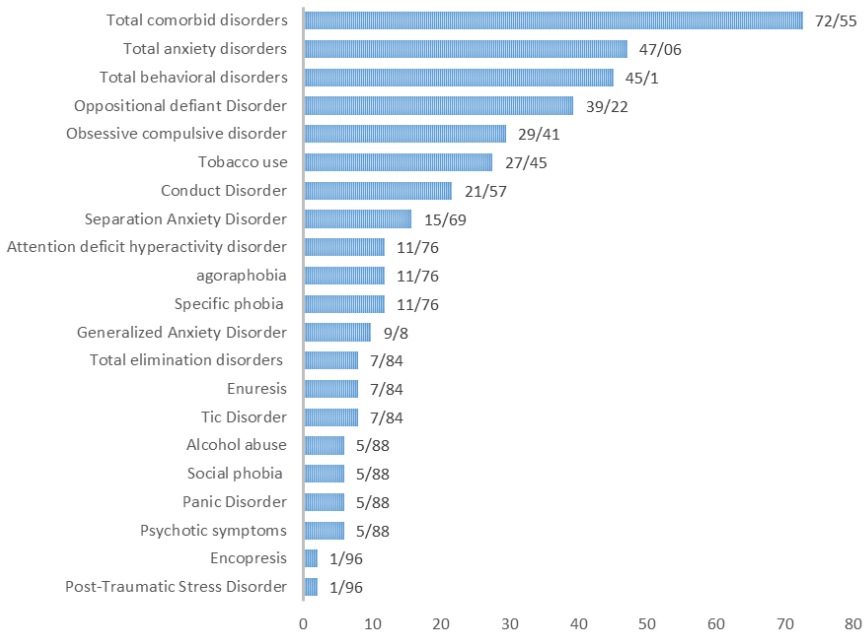

Figure 1. Rates of comorbid disorders in BMD obtained through national survey of psychiatric disorders in Iranian children and adolescents

Also, according to the logistic regression, the results showed that sex (male or female) did not significantly predict BMD. Similarly, based on the present results, Najafi-Vosough et al. reported that there was no association between the demographic data (gender, age, marital status) and mood disorder [37]. In contrast, some studies have recognized a set of important variables, such as being a girl, are linked to the vulnerability of youths to develop bipolar symptoms [38].

The higher prevalence in our sample compared to the rates found in previous studies may be the result of various factors, such as our inclusion criteria, different sample sizes, differences in diagnostic criteria, ethnic groups, cultural factors, and socioeconomic status.

Aside from distinctions in the recruitment approach, clinical evaluation, and demographic characterization of the participants, a probable explanation for different rates of prevalence may be attributed to the rules utilized for the detection of BMD.

Previous investigations reported that children and adolescents with BMD suffer from larger rates of mental problems compared to their community population before the peak incidence age of mania [39]. Also, the rate

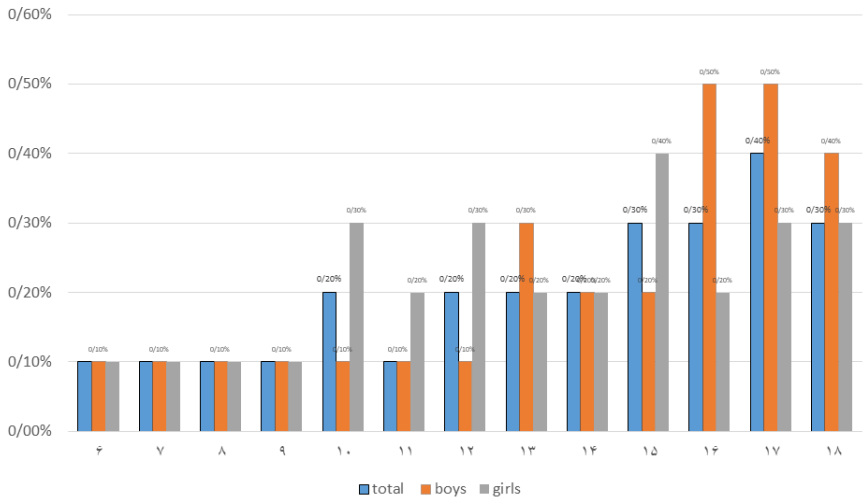

Figure 2. Sex difference in the rate of BMD in each year of life

of ADHD, mood disorders, and anxiety have been consistently reported [40-44]. Yapıcı Eser et al. reported in their research about the association between BMD and other psychiatric disorders that comorbidity of anxiety disorder, generalized anxiety disorder (GAD), social phobia, separation anxiety disorder, and obsessive-compulsive disorder were 44.7%, 12.7%, 27.4%, 20.1%, 26.1%, and 16.7%, respectively [45]. Gender, age of onset, comorbidity of substance use, ADHD, oppositional defiant disorder, and conduct disorder influenced each anxiety disorder's comorbidity with bipolar disorder in a different way.

There have been population-based studies showing that affective disorders are associated with social anxiety disorder [46, 47]. Comorbidity with disruptive behavior disorders and anxiety disorders, especially in the context of maternal mood disorders, appear to correlate with worse family performance among adolescents with BMD [48]. Mohammadi et al. (2019) reported that mood problems and anxiety disorders are more common among females [49]. Other comorbid conditions, such as pervasive developmental disorders and eating disorders, happen less prevalently. ADHD seems to be more prevalent among children with BMD, whilst conduct disorder, panic disorder, and substance abuse disorders seem to be more prevalent among teenagers with BMD [50].

Multiple studies have found that the prevalence of oppositional defiant disorder or ADHD may be higher among children versus adolescents with BMD [51]. Previous studies demonstrated that mood disorders and psychiatric illnesses were comorbid among youths. In terms of psychopathological comorbidity, disorders such as anxiety and ADHD have also been reported to be associated with less time in euthymia [52]. A study suggested that most children with BMD also manifested ADHD, major depressive disorder, anxiety disorders, oppositional defiant disorder, and other behavior and psychotic disorders [53]. However, Wozniak et al. expressed more resemblance between childhood-onset BMD and ADHD. They reported that children with ADHD who showed oppositionality, anger, and hyperactive behaviors also met DSM criteria for childhood-onset BMD [54].

While there is an association between social anxiety and BMD, only a few studies have investigated how BMD can be comorbid with social anxiety disorder (SAD) [55]. Contrary to the mentioned studies, Sharma (2018) reported that further research should be designed and performed to raise our comprehension of the effect of childbirth on BMD and comorbid psychiatric diseases [56].

Thus, the definition of comorbidity in BMD is important for multiple reasons. Firstly, it is very common and considerably impacts clinical practice. Secondly, one mental problem may cause the appearance of another or worsen its clinical course; therefore, curing and detecting comorbidity of bipolar disorders elevate the chance for early intervention in bipolar patients and improve outcomes through earlier treatment. Therefore, high rates of BMD make the reliability of the comorbidity concept into question, proposing that BMD can be a risk factor for subsequent development of accompanying mental illness but an exact diagnostic assessment is essential to diagnose other psychiatric illnesses from bipolar disorder. To sum up, further research exploring causal relationships between BMD and comorbid disorders is required. Meanwhile, as the results showed that about one-fifth of Iranian adolescents and children have at least one psychiatric disorder, interventions in this area will be useful [57].

Study strengths

The results observed in this survey and their interpretation point to its strengths and limitations. This research benefits from several strengths. First, this study obtained a large participation pool in 30 provinces. Second, we assessed BMD through semi-structured interviews with satisfactory psychometric properties rather than via self-report methods. Third, the study subjects included a randomly selected sample from 30 provinces in Iran; therefore, the results can be generalized to other children and adolescents in Iran.

Fourth, through controlling different factors, such as gender, ethnicity, paternal or maternal hospitalization, and other demographic parameters, we considered the possible impact of these variables on diagnosed BMD.

Study limitations

One of the limitations of this study is its cross-sectional nature which does not allow the investigation of possible causal relationships. In addition, some results are according to parental assessment (bipolar disorder) and clinical evaluation. Furthermore, some important variables were not included in our research, including genetic factors, month or season of birth, or parenting style, suggesting bipolar appraisal attributes (e.g., democratic, authoritative, or anarchistic) are related to a larger risk for bipolar symptoms compared to any other attributes (e.g., location or history of psychiatric problems, etc.). Such factors must be systematically included in future investigations.

5. Conclusions

This research extended our insight into BMD symptoms and risk factors among Iranian children and adolescents (aged from 6 to 18 years). First, the prevalence of BMD was higher among females. Second, our results suggested that gender or the father's education level were not the risk factors for BMD symptoms. Lastly, several factors, such as maternal education and maternal job, were also important for the prevalence of BMD symptoms. Our results can be helpful for mental health stakeholders to provide a well-designed developmental intervention for youths. This research used a proper research methodology to assess the predictors of psychopathology in youths. We hope that this survey could present a helpful roadmap for future national surveys of BMD prevalence. Researchers must attempt to assess BMD symptoms in youths to decrease the likelihood of other coming problems and possible recurrent psychiatric disorders.

Future direction

Future studies can investigate the effective factors in BMD and its related consequences to provide appropriate interventions and strategies in this field. Therefore, holding educational and executive meetings to minimize the occurrence of psychiatric disorders, especially bipolar disorders, and developing better mental health planning in the future should be on the agenda of policymakers.

Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this research.

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Authors' contributions

All authors equally contributed to preparing this article.

Conflict of interest

The authors declared no conflict of interest.

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