Quality of Sleep in Association with Relapse in Patients with Bipolar Affective Disorder

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ABSTRACT

Introduction: Bipolar Affective Disorders is an episodic mood disorder with significant global morbidity. Sleep deprivation in addition to being a core symptom and early warning sign of impending mood episodes can also trigger relapse. Individuals with Bipolar Affective Disorder in specific, differ in their tendency for sleep loss to trigger relapse depending on their sociodemographic and clinical factors.

Current study objective was to evaluate the frequency and quality of sleep as a trigger for relapse of mood episode in patients with bipolar affective disorders and to correlate it with socio-demographic profile and clinical variables.

Material and methods: This observational cross sectional clinical study was conducted on 62 patients with ICD10 diagnosis of bipolar affective disorders presenting with relapse of mood episode. Presence of acute sleep deprivation and chronic sleep insufficiency according to American academy of sleep medicine criteria was considered. Young Mania Rating Scale (YMRS) and Hamilton Depression Rating Scale (HAM D) were administered. Pittsburgh Sleep Quality Index (PSQI) Scale was used to assess quality of sleep. Written Informed consents were taken from all the subjects. The data was analyzed with appropriate statistical methods.

Results: Of the 62 patients assessed with diagnosis of bipolar affective disorders presenting with mood episode, 58.1% have poor quality of sleep and 41.9% have good quality of sleep. No statistically significant association noted in any domains of socio demographic profile. Statistically significant association is noted with triggers in the present episode of relapse with 94.4% of individual were noted to have sleep deprivation (p<0.001). 52.8% individuals with current episode manic, 16.7% with depression, 27.8% with hypomania and 2.8% with current episode mixed is noted to have poor quality of sleep and statistically significant association is noted with polarity of current episode. No statistically significant association noted between quality of sleep with other clinical variables.

Conclusion: Poor quality of sleep may trigger relapse of mood episode in patients with bipolar affective disorders. Our finding substantiates the need for careful assessment and management of sleep disturbances during maintenance phase for bipolar disorders.

Keywords: Bipolar Affective Disorders, Quality of Sleep, Relapse

INTRODUCTION

Individuals with bipolar affective disorder may have difficulties with sleep continuity and quality of sleep. Sleep disturbances can be independent risk factor or may have a bidirectional relationship with bipolar disorders. Rest activity patterns has also been investigated as a risk factor for future onset of affective episode in patient with bipolar disorders.[1,2] Evidence suggests that sleep loss in addition to being a core symptom also an early warning sign of impending mood episodes can trigger relapse particularly mania.[3] Sleep disturbances contributes to functional impairment and symptom worsening in bipolar disorder. Harvey et al reported that 70% of bipolar affective disorder patients had insomnia in the interepisode period.[4] Sylvia et al also noted that insomnia was associated with risk of relapse of mood episodes and suicide attempts.[5] 73/483 bipolar I and II subjects participating in the Systematic Treatment Enhancement Program for Bipolar Disorder who were euthymic for at least 8 weeks were included in their analysis and found that sleep disturbances at study entry was significantly associated with risk for mood episode recurrence.[5] Gruber et al examined concurrent and prospective associations between total sleep time and sleep variability with symptom severity and functioning in a cohort of DSM-IV bipolar patients (*N*=468) participating in the National Institute of Mental Health Systematic Treatment Enhancement Program for Bipolar Disorder and found that shorter total sleep time was associated with increased mania severity and greater sleep variability was associated with increased mania and depression severity.[6]

Sleep disturbances contributes to affective dysfunction in bipolar affective disorders. Short sleepers exhibited more symptoms of mania, depression, anxiety and irritability, lower scores on functioning and life satisfaction as compared to bipolar disorder patients with longer sleep times.[7] Sleep disturbance was a common prodrome of relapse.[8] Experimentally induced sleep deprivation was associated with onset of hypomania or mania.[9] In a 7 day diary study, total wake time was associated with next day morning negative mood in bipolar affective disorder while evening negative mood was associated with subsequent total wake

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time in both bipolar disorder and insomnia.[10] Total sleep time was shortest in bipolar affective disorder not otherwise specified. Among individuals treated with mood stabilizers in systematic treatment enhancement program in bipolar disorder 66% experienced significant sleep disturbance.[11]

Lewis et al conducted study on 3140 individuals with DSM-IV diagnosis of bipolar disorder and found that sleep loss had triggered episodes of high mood and frequently noted in female gender and BD-I subtype.[12] A convergence of evidence suggests that sleep problems in bipolar disorder may result from dysregulation across both process C and process S systems. Biomarkers of depressive episodes include heightened fragmentation of rapid eye movement (REM) sleep, reduced REM latency, increased REM density, and a greater percentage of awakenings, while biomarkers of manic episodes include reduced REM latency, greater percentage of stage I sleep, increased REM density, discontinuous sleep patterns, shortened total sleep time, and a greater time awake in bed.[13,14] Latalova et al reported that disturbance of the sleep/wake cycle has been a core component of bipolar disorder and reduced total sleep time is a predictor of manic episodes.[15] Although several studies have observed the association of insomnia with mood episode Kaplan et al reported that hypersomnia was also prevalent and persistent across mood disorders. Hypersomnia was experienced by roughly 25% bipolar affective disorder patients during inter episode period and by 40-80% during episode of depression.[16] Multiple lines of evidence suggest that sleep disruption may be an underlying trigger for manic and depressive episodes that sleep improvement may be a clinically useful therapeutic target and successful prevention of relapse may rely in part on maintaining good quality sleep.[15]

Study objectives were to evaluate quality of sleep as a trigger for relapse of mood episode in patients with bipolar affective disorders and to correlate socio-demographic profile and clinical variables with quality of sleep in patients of bipolar affective disorders.

MATERIAL AND METHODS

This observational cross sectional clinical study was conducted in the Department of Psychiatry, Father Muller Medical College Hospital, Mangalore which is a multi-specialty tertiary care hospital. All Out Patients and Inpatients with diagnosis of bipolar affective disorder with relapse of mood episode according to ICD 10 DCR criteria constituted study population. The study was conducted from March to August 2018. 62 consecutive individuals with a diagnosis of bipolar affective disorder according to ICD 10 DCR criteria who fulfilled the inclusion and exclusion criteria were selected as sample for this study.

The inclusion criteria were 1) Patients with diagnosis of Bipolar affective disorder according to ICD 10 DCR criteria presenting with relapse of mood episode 2) Male and female patients 3) Age between 18 to 65 years.

Exclusion criteria were 1) Patients with substance dependence other than nicotine 2) Presence of comorbid

psychiatric disorder 3) Presence of major medical illness 4) Individuals who did not give consent for the study.

This clinical study was approved by the institutional ethics committee. The design and nature of the clinical study was explained to all the participants. Written informed consent from all the participants or their relatives was obtained in their local language. Individuals diagnosed with bipolar affective disorders presenting with relapse of mood episode were assessed within 1 week of admission and during outpatient department consultation. All the participants were subjected to thorough physical and mental status examination at the first contact with the investigator. Clinical and sociodemographic variables were recorded in the semistructured proforma. Presence of acute sleep deprivation and chronic sleep insufficiency according to American academy of sleep medicine criteria was considered. Rating scales were administered to all the patients. Young Mania Rating Scale (YMRS) and Hamilton Depression Rating Scale (HAM D) were administered to assess the severity of mania and depression respectively. Pittsburgh Sleep Quality Index (PSQI) Scale was used to assess quality of sleep. The Pittsburgh Sleep Quality Index (PSQI) is an effective instrument used to measure the quality and patterns of sleep. It differentiates "poor" from "good" sleep quality by measuring seven areas: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications and daytime dysfunction over the last month. A total score of 5 or greater is indicative of poor quality sleep.

STATISTICAL ANALYSIS

Descriptive analysis such as percentage, frequency, central tendencies and test for normal distribution were performed. Categorical data was represented in the form of frequencies and proportions. Chi-square test and fishers exact test was used as test of significance for qualitative data. For correlation, Karl Pearson correlation test was used. Licensed Statistical software: MS Excel, SPSS version 22 (IBM SPSS Statistics, Somers NY, USA) was used to analyze data.

RESULTS

Of the 62 patients assessed with diagnosis of bipolar affective disorders presenting with relapse of mood episode, there is no statistically significant association noted in the socio demographic domains of age, gender, religion, education, marital status, occupation, residence, type of family and monthly income. Although among those with poor quality of sleep majority were in the age group 30 to 40 years (44.4%), male (69.4%), Hindu religion (52.8%), studied till high school (44.4%), married (63.9%), semi skilled worker (19.4%), rural area (75%), nuclear family (69.4%) and monthly income of 5000 to 10,000 rs (36.1%). Sociodemographic parameters in association with quality of sleep are summarized in Table 1.

In the present study 58.1% have poor quality of sleep and 41.9% have good quality of sleep. Among the individuals with poor quality of sleep 5.6% have substance use, 94.4% have

		PSQI				p value
		Poor Quality Sleep		Good Quality Sleep		
		Count	%	Count	%	
Age	18 to 30 years	10	27.8%	6	23.1%	0.192
	30 to 40 years	16	44.4%	6	23.1%	
	40 to 50 years	4	11.1%	6	23.1%	
	>50 years	6	16.7%	8	30.8%	
Gender	Male	25	69.4%	17	65.4%	0.736
	Female	11	30.6%	9	34.6%	
Religion	Hindu	19	52.8%	15	57.7%	0.391
	Muslim	12	33.3%	5	19.2%	
	Christian	5	13.9%	6	23.1%	
Education	Illiterate	2	5.6%	2	7.7%	0.297
	Primary school	7	19.4%	4	15.4%	
	Middle School	2	5.6%	5	19.2%	
	High school	16	44.4%	6	23.1%	
	Pre degree	5	13.9%	3	11.5%	
	Graduate	4	11.1%	6	23.1%	
Marital Status	Single	11	30.6%	9	34.6%	0.834
	Married	23	63.9%	16	61.5%	
	Separated	1	2.8%	1	3.8%	
	Widowed	1	2.8%	0	0.0%	
Occupation	Unskilled worker	6	16.7%	4	15.4%	0.590
	Semi-skilled worker	7	19.4%	4	15.4%	
	Skilled worker	2	5.6%	2	7.7%	
	Professional	3	8.3%	6	23.1%	
	Business	4	11.1%	0	0.0%	
	Student	2	5.6%	1	3.8%	
	Unemployed	6	16.7%	5	19.2%	
	Others	6	16.7%	4	15.4%	
Residence	Urban	9	25.0%	10	38.5%	0.257
	Rural	27	75.0%	16	61.5%	
Type of Family	Nuclear	25	69.4%	23	88.5%	0.190
	Joint	10	27.8%	3	11.5%	
	Extended	1	2.8%	0	0.0%	
Monthly income	<5000 rs	4	11.1%	2	7.7%	0.883
	5000-10000 rs	13	36.1%	9	34.6%	
	10000-25000rs	12	33.3%	11	42.3%	
	>25000rs	7	19.4%	4	15.4%	

Table-1: Association between quality of sleep and socio demographic profile.

Polarity of Current Episode
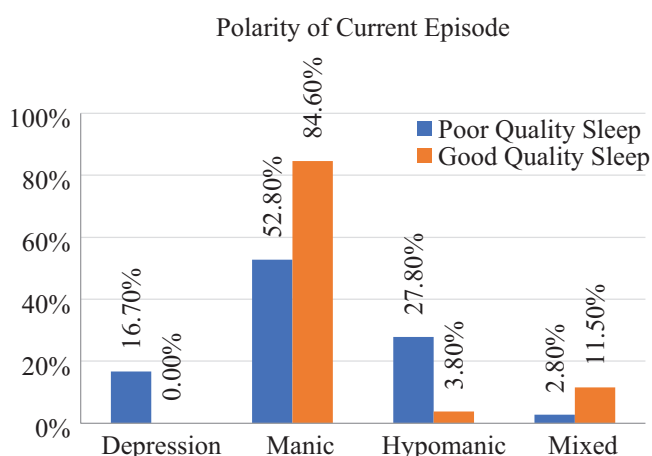
Figure-1: Bar diagram showing Polarity of Current Episode in association with Quality of sleep

sleep deprivation, 5.6% have poor compliance to medication and 11.1% have other stressors including financial, emotional and physical stressors as triggers in present episode. Among individuals with good quality of sleep 26.9% have substance use, 53.8% have poor compliance to medication and 19.2% have other factors, stressors including financial, emotional and physical as triggers in present episode. There is statistically significant association between triggers in present episode and sleep quality (p <0.001). 63.9% of individuals with acute onset, 16.7% with abrupt onset, 19.4% of individuals with insidious onset of symptoms for the current episode have poor quality of sleep. 5.6% of individuals with total duration illness less than 1 year, 27.8% with duration of illness 1- 3 years, 33.3% with duration 3 – 6 years, 11.1% of individuals with duration 6- 9 years, 22.2% of patients with total duration of illness more than 9 years were noted to have poor

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		PSQI				p value
		Poor Quality Sleep		**Good Quality Sleep**		
		Count	%	Count	%	
Triggers in Present Episode	Substance use	2	5.6	7	26.9	<0.001
	Sleep deprivation	34	94.4	0	0.0	
	Poor compliance to medication	2	5.6	14	53.8	
	Any other stressors including financial, emotional and physical	4	11.1	5	19.2	
Mode of onset	Acute	23	63.9%	20	76.9%	0.402
	Abrupt	6	16.7%	4	15.4%	
	Insidious	7	19.4%	2	7.7%	
Duration of illness	1 years	2	5.6%	1	3.8%	0.382
	1 - 3 years	10	27.8%	6	23.1%	
	3 - 6 years	12	33.3%	5	19.2%	
	6 - 9 years	4	11.1%	2	7.7%	
	> 9 years	8	22.2%	12	46.2%	
No of episodes in past	1 – 2	13	36.1%	9	34.6%	0.360
	2 – 4	17	47.2%	8	30.8%	
	4 – 8	2	5.6%	4	15.4%	
	> 6	4	11.1%	5	19.2%	
Duration of current episode	1 month	21	58.3%	16	61.5%	0.548
	1 - 3 month	12	33.3%	6	23.1%	
	3 - 6 month	3	8.3%	3	11.5%	
	6 - 12 month	0	0.0%	1	3.8%	
Duration of past episode	1 month	15	41.7%	10	38.5%	0.713
	1 - 3 month	18	50.0%	15	57.7%	
	3 - 6 month	3	8.3%	1	3.8%	
Age at onset	11 – 16 years	6	17.1%	4	15.4%	0.997
	17 – 24 years	13	37.1%	9	34.6%	
	25 – 30 years	9	25.7%	8	30.8%	
	31 – 40 years	4	11.4%	3	11.5%	
	41 – 50 years	2	5.7%	1	3.8%	
	51 – 64 years	1	2.9%	1	3.8%	
Family History	Mood Disorder	11	30.6	8	30.8	0.305
	Psychosis	0	0.0	1	3.8	
	Substance Use	4	11.1	4	15.4	
	Others	8	22.2	2	7.7	
	Nil	14	38.9	14	53.8	
Medical Co morbidities	Yes	11	30.6%	7	26.9%	0.756
	No	25	69.4%	19	73.1%	
Details of Medications	Regularly taking medications	26	72.2%	14	53.8%	0.519
	Irregularly	8	22.2%	10	38.5%	
	Stopped taking	1	2.8%	1	3.8%	
	Never started taking	1	2.8%	1	3.8%	

Table-2: Association of Quality of sleep with clinical variables

		PSQI				P value
		> 5 = Poor Quality Sleep		**< 5 = Good Quality Sleep**		
		Count	%	Count	%	
YMRS Score	≤3	2	6.1%	0	0.0%	0.208
	4 – 7	1	3.0%	3	11.5%	
	8 -12	30	90.9%	23	88.5%	

Table-3: Association between YMRS score with respect to quality of sleep

quality of sleep. Poor quality of sleep is noted with 36.1% of patients with 1- 2 mood episodes in the past, 47.2% with 2 -4, 5.6%with 4-8 and 11.1% with more than 6 mood episodes in the past respectively.58.3% of patients with duration of currentepisode 1 month, 33.3% with 1- 3 months, 8.3% with 3- 6 months of illness were noted to have poor quality of sleep. Poor quality of sleep is noted in 17.1% of individuals with age of onset 11- 16 years, 37.1% of individuals 17- 24 years, 25.7% 25 – 30 years,11.4% 31 – 40 years, 5.7% 41- 50 years and 2.9% of individuals with onset 51- 64 years. 30.6%

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of patients with family history of mood disorder are noted to have poor quality of sleep. No statistically significant association is noted with other clinical variables. The data ofassociation of quality sleep with clinical variables are summarized in Table 2.

Correlating the polarity of current episode with quality of sleep, in the present study 52.8% of patients with current episode manic are noted to have poor quality of sleep. 16.7% with depression, 27.8% with hypo manic episodes and 2.8% with mixed episodes as polarity in current episode are noted to have poor quality of sleep. Statistically significant association is noted comparing polarity of current episode with quality of sleep (p <0.004).The data is summarized in figure 1.

Correlating quality of sleep in association with YMRS score, among those with poor quality of sleep90.9% of individuals with YMRS score of 8 to 12, 3% with score of 4 to 7 and 6.1% with score of ≤ 3 have poor quality of sleep.Although poor quality of sleep is noted with higher score of YMRS.No statistically significant association between YMRS score and quality of sleepfound [Table 3]. In the present study HAMD was administered to BPAD patients presenting with current episode depression, poor quality of sleep is noted in 28.6% with HAMD score 8 – 13indicating mild depression, 42.9% with HAMD score 14- 18 indicating moderate depression and 28.6% with HAMD score 19 – 22 indicating severe depression. No statistically significant association noted between HAMD score and quality of sleep.

DISCUSSION

This observation cross sectional clinical study conducted in father Muller medical college hospital which is a tertiary care multispecialty general teaching hospital in Mangalore. The present researchers have assessed the association of quality of sleep and relapse of mood episode in individuals with bipolar affective disorders. The results of the present investigation indicate the association of poor quality of sleep with relapse of mood episode in patients with bipolar affective disorders.Of the 62 patients assessed with diagnosis of bipolar affective disorders,58.1% have poor quality of sleep and 41.9% have good quality of sleep. In the present study it is observed that sleep deprivation as a trigger in the present episode for relapse found to have significant association with poor quality of sleep. Statistically significant association is noted with triggers in the present episode of relapse with 94.4% of individual with poor quality of sleep in the current episode for trigger noted to have sleep deprivation (p<0.001). Results of the present study are in concordance with earlier studies.[3,4,5,6,7] In the present study there is no statistically significant association found between quality of sleep with various clinical factors such as duration of illness, number and severity of current and past episodes,age and mode of onset.Current investigation also noted that relapse due to poor quality sleep is noted to be highest among current manic episodes (52.8%) followed by hypomanic (27.8%), depressive (16.7%) and mixed episode (2.8%). Higher relapse of manic episodes due to sleep loss

as noted in our study is in concordance with results of earlier studies.[3,4,6,9,12] Present investigation found a statically significant association between quality of sleep and polarity of current episode (p value 0.004).

In our study no statistically significant association noted in the socio demographic domains of age, gender, religion, education, marital status, occupation, residence, type of family and monthly income. The results of the study are in concordance with previous studies.[5] Current investigation higher proportions of poor quality of sleep is noted in the age group 30 to 40 years (44.4%), male (69.4%), Hindus (52.8%), studied till high school(44.4%), married(63.9%), semi-skilled worker (19.4%), rural area(75%), nuclear family (69.4%) and monthly income of 5000 to 10000 rs (36.1%). Gender and bipolar subtype may increase vulnerability to high mood following sleep deprivation.[12] Higher male preponderance (69.4%) is seen in our study although no statisticallysignificant association is noted with quality of sleep. Previous studies have found higher femalepreponderance[7,12] Sleep loss triggering episodes of high mood was associated with female gender and BD-I subtype.[12]

Present researchers investigated the association between quality of sleep and YMRS and HAMD score. Among those with poor quality of sleep, 90.9% of individuals with YMRS score of 8 to 12, 3% with score of 4 to 7 and 6.1% with score of ≤ 3 have poor quality of sleep. Although poor quality of sleep is noted with higher score of YMRS no significant association noted between YMRS score and quality of sleep. (Table 3) In the present study poor quality of sleep is noted in 28.6% with HAMD score 8 – 13, 42.9% with HAMD score 14- 18 and 28.6% with HAMD score 19 – 22. No significant association noted between HAMD score and quality of sleep. Multiple lines of evidence suggestthat impaired sleep can induce and predict manic episodes. Treatment of sleep disturbance may serve as both a target of treatment and a measureof response in mania. The depressivephase of bipolar illness is marked by sleep disturbance that may be amenable to somatic therapies that target sleep and circadian rhythms. Residual insomnia in the euthymic period may represent a vulnerability to affective relapse in susceptible patients.[17]

Sleep disturbances are among the most prominent correlates of mood episodes and inadequate recovery. Sleep disturbance in bipolar disorders is important because it impairs quality of life, contributes to relapse and has adverse consequences for affective functioning.[18] Results suggest that sleep disturbance is an important risk factor for relapse of bipolar disorder and should be considered a target for pharmacologic or psychosocial maintenance treatment. Sleep loss may trigger mood episodes in people with bipolar disorder but individual differences could influence vulnerability to this trigger.

Certain limitations of our study are relatively small sample size. Sample is not representative of general population. It is difficult to distinguish whether sleep loss was a trigger or prodrome of mood episodes. Association between poor quality of sleep and impairment in socio-occupational functioning needs[3,6,9] further assessment.Further studies are

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required to draw definitive conclusions.

The findings of this study can highlights future implicationsof management for bipolar disorder particularly in light of recent attempts to engage patients with self monitoring tools and regular assessment for sleep disturbances which aim to alert the individual of impending mood episodes based on the fluctuations in behaviors such as sleep. Clinicians should therefore discuss the importance of sleep deprivation with the patients to encourage regular sleep pattern and sleep hygiene. Findings points to the need for psychoeduction of bipolar affective disorder with emphasis of good quality of sleep in view of preventing further episode along with other managementstrategies of bipolar affective disorders.

CONCLUSION

In conclusion, poor quality of sleep may trigger relapse of mood episode in patients with bipolar affective disorders. Our findings reveal that the triggers in present episode predominantly sleep deprivation and polarity of episode were significantly associated with poor quality of sleep. Study highlights intricate relationship between quality of sleep and relapse of mood episode in patients with bipolar disorder.

REFERENCES

1. Rumble ME, White KH, Benca RM. Sleep Disturbances in Mood Disorders. Psychiatric Clinic North America 38:743 – 759.
2. Peterson MJ, Benca RM. Sleep in mood disorders. Psychiatric clinic North America 2006;29:1009- 1032.
3. Harvey AG, Kaplan KA, Soehner A. Interventions for Sleep Disturbance in Bipolar Disorder. Sleep Med Clin. 2015; 10: 101–105.
4. Harvey AG, Schmidt DA, Scarna A, Semler CN, Goodwin GM. Sleep related functioning in euthymic patients with bipolar disorder, patients with insomnia, and subjects without sleep problems. American journal of psychiatry. 2005;162:50-57.
5. Sylvia LG, Dupuy JM, Ostacher MJ, Cowperthwait CM, Hay AC, Sachs GS, Nierenberg AA, Perlis RH. Sleep disturbance in euthymic bipolar patients. Journal of Psychopharmacology. 2012;26:1108-12.
6. Gruber J, Miklowitz DJ, Harvey AG, Frank E, Kupfer D, Thase ME, Sachs GS, Ketter TA. Sleep matters: Sleep functioning and course of illness in bipolar disorder. Journal of Affective Disorders. 2011:134:416-20.
7. Gruber J, Harvey AG, Wang PW, Brooks JO 3rd, Thase ME, Sachs GS, Ketter TA. Sleep functioning in relation to mood, function, and quality of life at entry to the Systematic Treatment Enhancement Program for Bipolar Disorder (STEP-BD) Journal of Affective Disorders. 2009;114:41–49.
8. Jackson A, Cavanagh J, Scott J. A systematic review of manic and depressive prodromes. Journal of Affective Disorders. 2003;74:209–217.
9. Wehr TA, Sack DA, Rosenthal NE. Sleep reduction as a final common pathway in the genesis of mania. American Journal of Psychiatry. 1987;144:201–204.
10. Talbot LS, Stone S, Gruber J, Hairston IS, Eidelman P, Harvey AG. A test of the bidirectional association between sleep and mood in bipolar disorder and insomnia. Journal of Abnormal Psychology. 2012;121:39-50.
11. Sachs GS, Thase ME, Otto MW, Bauer M, Miklowitz D, Wisniewski SR, et al. Rationale, design, and methods of the systematic treatment enhancement program for bipolar disorder (STEP-BD) Biological Psychiatry. 2003;53:1028–1042.
12. Lewis KS, Gordon-Smith K, Forty L, Di Florio A, Craddock N, Jones L, Jones I. Sleep loss as a trigger of mood episodes in bipolar disorder: individual differences based on diagnostic subtype and gender. British Journal of Psychiatry.2017; 211: 169–174.
13. Gold KA, Sylvia LG. The role of sleep in bipolar disorder.NatSci Sleep.2016; 8: 207–214.
14. Mansour HA, Monk TH,Nimgaonkar VL. Circadian genes and bipolar disorder.Annals of Medicine.2005; 37: 196–205
15. Latalova K, Prasko J, Kamaradova D, GrambalA, Havlikova P, Jelenova D, Mainerova B, Ociskova M, Sedlackova Z, Sandoval A. Bipolar disorder and sleep problems. Act Nerv Super Rediviva 2013; 55: 173–183.
16. Kaplan KA, Harvey AG. Hypersomnia across mood disorders: a review and synthesis. Sleep Med Rev. 2009; 13:275–285.
17. Plante DT, Winkelman JW. Sleep Disturbance in Bipolar Disorder: Therapeutic Implications. Am J Psychiatry 2008; 165:830–843.
18. Harvey AG. Sleep and Circadian Rhythms in Bipolar Disorder: Seeking Synchrony, Harmony, and Regulation. Am J Psychiatry 2008; 165:820–829.