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Sleep quality and sleep duration in the acute and remission phase of mood disorders

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Summary

Introduction. Sleep disturbances are a common and significant issue in mood disorders, including both bipolar and major depressive disorders. The impact of sleep problems can be observed during acute depressive episodes as well as in the euthymic phase. This study aims to investigate the quality and duration of sleep in patients with mood disorders, examining the differences between the acute depressive phase and euthymic phase, and their potential consequences on patients' well-being and symptom severity.

Objectives. The objectives of this study are to evaluate the presence, frequency, and characteristics of sleep disorders in patients with different mood disorders (Major Depressive Disorder, Bipolar Disorder I and II), both during acute phases of a depressive episode and during euthymia.

Methods. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI), while sleep duration was evaluated using a specific item (number 4) from the PSQI to define the manifestation of insomnia (< 6.5h), hypersomnia (> 9h), and normal sleep duration (6.5-9h). Descriptive and statistical analyses were performed using SPSS version 26.0 software.

Results. We discovered that sleep disturbances are highly prevalent not only during the acute phase of the depressive episode but also during the euthymic phase of mood disorders. Ninety-six percent of patients with mood disorders experienced poor sleep quality (PSQI global score greater than 5) during the acute phase, and 53% of patients had poor sleep quality in the euthymic phase. In the acute phase, 22.9% of our patients had normal sleep duration, 62.5% had reduced sleep duration, and 14.6% had increased sleep duration-hypersomnia. A percentage of 39.8% of euthymic patients had normal sleep duration (6.5-9 hours), while 27.6% had reduced sleep duration (less than or equal to 6.5 hours), and 32.7% had increased sleep duration - hypersomnia (sleep duration greater than or equal to 9 hours).

Conclusions. Sleep disturbances are very frequent both in the acute and remission phases of mood disorders. More studies are necessary to establish the role of sleep disturbances as a possible cause or predictor of acute mood episodes or a worse course of mood disorders.

Key words: sleep, bipolar disorder, major depressive disorder

Background

Mood disorders, encompassing bipolar and major depressive disorders, are often accompanied by sleep disturbances, which can exacerbate symptoms

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and impair overall functioning [1]. Sleep problems, including insomnia, hypersomnia, and irregular sleep-wake patterns, have been linked to a range of adverse outcomes such as decreased quality of life, cognitive deficits, and increased risk of relapse [2]. During acute depressive episodes in both bipolar and major depressive disorders, sleep disturbances are frequently reported, which can further worsen the severity of depressive symptoms [3]. These sleep problems may manifest as difficulties falling asleep, maintaining sleep, or experiencing a nonrestorative sleep [4]. Moreover, research has shown that persistent sleep disturbances during the acute phase can contribute to poorer treatment outcomes and a more prolonged recovery process [4]. In the euthymic phase, when individuals with mood disorders are not experiencing acute symptoms, sleep disturbances may still persist [3]. These residual sleep problems can negatively impact the overall well-being of the affected individuals and increase the risk of relapse into a depressive or manic episode [1]. Understanding the nature of sleep disturbances during both the acute depressive phase and euthymic phase is crucial for developing targeted interventions that can improve sleep quality and promote long-term recovery in individuals with mood disorders.

Methods

This observational study encompassed 146 patients diagnosed with major depressive disorder (n = 42), bipolar disorder type 1 (n = 65) with the most recent depressive episode, or bipolar disorder type 2 (n = 39) with the most recent depressive episode. Participants were recruited at the Division of Psychiatry, Department of Molecular and Developmental Medicine, University of Siena, Italy. Of the total cohort, 98 participants were enrolled as outpatients in the euthymic phase, characterized by a Montgomery-Asberg Depression Rating Scale (MADRS) score of less than 7 and by a Young Mania Rating Scale (YMRS) score of less than 7, while 48 participants were recruited as inpatients during the initial day of hospitalization in the acute phase of a depressive episode, defined by a MADRS score exceeding 22. Diagnostic validation was carried out utilizing the Mini-International Neuropsychiatric Interview (M.I.N.I.). The investigation assessed sleep characteristics via the Pittsburgh Sleep Quality Index (PSQI), with a score greater than 5 indicative of suboptimal sleep quality. Item number 4 of the PSQI: “During the past month, how many hours of actual sleep did you obtain at night? (This may differ from the number of hours spent in bed.)” was used to evaluate sleep duration and to define the manifestation of insomnia (sleep equal to or less than 6 and a half hours), hypersomnia (sleep equal to or greater than 9 hours), or normal sleep duration (between 6 and a half hours and 9 hours). Statistical analyses were performed using SPSS version 26.0 software.

Results

The euthymic group consisted of 98 subjects aged between 18 and 78 years, with a mean age of 48.82 years and a standard deviation of 14.5. Of these patients, 42 were male (42.9%), 23 had a diagnosis of major depressive disorder (23.5%), 46 had type 1 bipolar disorder (46.9%), and 29 had type 2 bipolar disorder (29.6%). The acute phase (depressive episode) group included 48 subjects aged between 18 and 79 years, with a mean age of 49.35 years and a standard deviation of 15.642. Of these patients, 17 were male (35.4%), 19 had a diagnosis of major depressive disorder (39.6%), 19 had type 1 bipolar disorder (39.6%), and 10 had type 2 bipolar disorder (20.8%).

All the study participants were treated with psychotropic medications, and many were taking more than one drug (with an average of 3.08 medications). Specifically, 54,79% of them were taking antipsychotics, 82,19%% were taking classic mood stabilizers such as lithium, valproate, and carbamazepine, 81,5% were taking antidepressants, 13,69% were taking hypnotics and/or benzodiazepines, 23,97% were taking anticonvulsants (e.g., gabapentin, pregabalin, topiramate) that were not included in the classes mentioned above, and only 4% were taking bupropion or stimulants (e.g., methylphenidate, atomoxetine, etc.). It’s worth noting that many patients were taking medications (e.g., sedating antipsychotics, trazodone, low dose benzodiazepines, etc.) that are more likely to decrease rather than increase the percentage of people with insomnia. Only a few patients (4%) were taking medications such as stimulants, bupropion, etc. that may increase the percentage of patients with insomnia. However, this percentage is quite low, and these medications were all administered in the morning.

We found that 53% of patients in the euthymic phase and 96% of those experiencing acute depressive episodes had poor sleep quality, endorsing a PSQI Global Score of more than 5. The euthymic patients had a mean Global Score of 6.32 (SD = 3.986), while the acute phase patients had a mean Global Score of 11.52 (SD = 3.679). The mean PSQI Global Scores for MDD, BD1, and BD2 subgroups were 9.05 (SD = 3.679), 7.58 (SD = 4.736), and 7.73 (SD = 5.070), respectively.

A comparison of the mean PSQI Global Scores between the two groups (euthymic and acute depressive episode) was conducted using an independent t-test. The analysis yielded a t-value of -7.598 ($df = 144$, $p < 0.001$), indicating a statistically significant difference in the mean scores. The mean difference was -5.205 (95% CI: -6.559 to -3.850). The resulting p-value was found to be highly significant ($p < 0.001$). This indicates a statistically significant difference in the mean Global Scores between the euthymic patients and those in the acute phase of a depressive episode.

To investigate a potential correlation between the three diagnostic subcategories examined (Major Depressive Disorder [MDD, Bipolar Disorder Type 1 [BD1, and

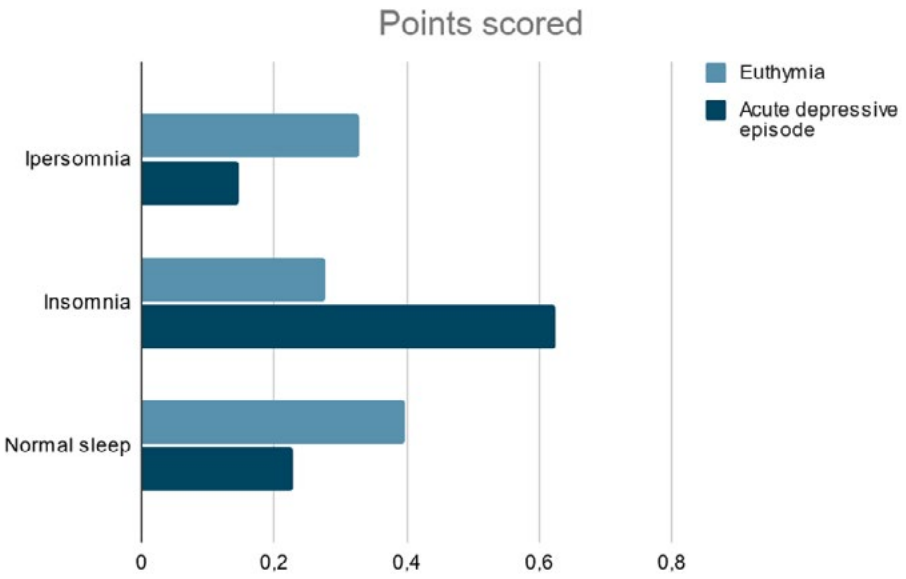

Figure 1. Sample characterization based on disease status and sleep duration.

Bipolar Disorder Type 2 [BD2) and the severity of sleep disturbances, we employed a one-way ANOVA analysis. Each diagnostic subgroup (independent variable) was compared to the Global Score of the Pittsburgh Sleep Quality Index (PSQI) (dependent variable). This analysis was carried out for both euthymic and acute patient groups. In both cases, no statistically significant differences were found (F-value: 1,390; p < 0,252), suggesting that the *diagnostic subcategory may not be* a major factor influencing sleep disturbance severity within our sample.

Regarding sleep duration (Fig. 1), 39.8% of euthymic patients had normal sleep duration (6.5-9 hours), 27.6% had reduced sleep duration (less than or equal to 6.5 hours), and 32.7% had increased sleep duration - hypersomnia (sleep duration greater than or equal to 9 hours). Among the patients in the acute phase, 22.9% had normal sleep duration, 62.5% had reduced sleep duration, and 14.6% had increased sleep duration-hypersomnia.

In the euthymic state, insomnia was reported by 55.0% of MDD patients, 69.2% of BD1 patients, and 75.6% of BD2 patients, while hypersomnia was reported by 50.0% of MDD patients, 94.4% of BD1 patients, and 90.9% of BD2 patients. In contrast, normal sleep patterns were observed in 54.5% of MDD patients, 76.2% of BD1 patients, and 94.4% of BD2 patients in the euthymic state. In the acute depression state, insomnia was reported by 45.0% of MDD patients, 30.8% of BD1 patients, and 24.4% of BD2 patients, whereas hypersomnia was experienced by 50.0% of MDD patients, 5.6% of BD1 patients, and 9.1% of BD2 patients. In this state, normal sleep patterns were observed in 45.5% of MDD patients, 23.8% of BD1 patients, and 5.6% of BD2 patients.

In addition, we performed a two-factor ANOVA to examine the interaction between diagnostic subgroups (MDD, BD1, BD2) and patient groups (eutymic or acute) on the sleep polarity variable (insomnia, hypersomnia, normal sleep pattern). The results showed no statistically significant differences in sleep polarity among the diagnostic subgroups (F = 0.448, p = 0.640) or between eutymic and acute depressed patients (F = 0.044, p = 0.835). The low R-squared value (0.006) suggests that the model may not adequately explain the variance in the sleep polarity data. Our findings indicate that, in the euthymic state, insomnia and hypersomnia were more prevalent among BD1 and BD2 patients than MDD patients, while normal sleep patterns were more common among BD1 and BD2 patients. Conversely, in the acute depression state, MDD patients experienced higher rates of both insomnia and hypersomnia, with normal sleep patterns being less prevalent than in BD1 and BD2 patients. However, when assessing the interaction between diagnostic subgroups and mood states through a two-factor ANOVA, we found no statistically significant differences in sleep polarity among the diagnostic subgroups (F = 0.448, p = 0.640) or between eutymic and acute depressed patients (F = 0.044, p = 0.835). The low R-squared value (0.006) implies that the model may not adequately explain the variance in the sleep polarity data.

Discussion

This study highlights the ubiquitous presence of sleep disturbances in patients with mood disorders, not only during acute episodes but also during euthymic periods [3].

More than half of the participants had suboptimal sleep quality during remission, with only 39.8% reporting normal sleep duration. As expected, these percentages were even higher in the acute depressive phase. These findings support previous research showing the persistence of sleep disturbances in mood disorders, regardless of the current phase of illness [1,3]. The persistent nature of poor sleep quality and altered sleep duration during remission highlights the need for a broader understanding of sleep abnormalities as potential precursors or contributors to new acute episodes [2]. These results suggest that, although there are observable trends in sleep disturbances across mood disorder diagnoses and mood states, the interaction between these factors may not be statistically significant. Furthermore, given the well-established negative impact of sleep disturbances on overall functioning and quality of life in patients with mood disorders, it is crucial that these issues are identified early and addressed with appropriate interventions [4]. Our findings highlight the need for clinicians to be vigilant in monitoring and addressing sleep disturbance in people with mood disorders, even during periods of symptom remission. Future research, including larger and longitudinal studies, should be undertaken to investigate the role of sleep disturbance as a potential predictor of relapse and to identify optimal treatment strategies for managing these disturbances at different stages of mood disorders [1].

Limitations

Our study has several limitations, including the relatively limited number of patients in the acute phase of a depressive episode and the lack of follow-up, which prevents us from observing the long-term course of these subjects. Other limitations include the absence of a control group of subjects without a mood disorder and the lack of an objective measurement of sleep duration and quality.

Conclusions

In conclusion, our study highlights the persistent nature of sleep disturbances in individuals with mood disorders, both in the acute phase of major depression and during the euthymic phase [3]. These findings emphasize the importance of addressing sleep disturbances as a key component of mood disorder treatment, even during periods of symptom remission. Future research should aim to elucidate the mechanisms underlying these sleep disturbances and identify effective interventions to improve sleep and overall outcomes in individuals with mood disorders [1,2].

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