



# The Impact of the Lockdown during Covid-19 Outbreak on the Sleep Quality of People with Bipolar Disorder: A Systematic Review

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## Abstract

**Background:** Individuals with severe mental illnesses, especially those with Bipolar Disorder (BD), it is possible to be at high risk for adverse mental health outcomes associated with the coronavirus disease 2019 (Covid-19) pandemic. **Purpose:** So far, little is known about how imposed restrictions affect sleep, which is frequently disrupted in patients with BD. Thus, the purpose of this systematic review was to examine the impact of Covid-19 on the sleep quality of individuals with BD. **Methods:** An extensive literature search was conducted in PubMed and Scopus databases according to PRISMA guidelines for studies published between January 2019 and June 2022. The last step of the search yielded 8 original studies. In all studies, participants completed self-ratings of symptom severity and daily mood experiences, while most assessments were conducted via telephone, by a psychiatrist, or a psychologist. The diagnosis was made according to DSM-5 criteria. **Results:** Studies compared healthy individuals to people with BD or people with mental illnesses (BD vs. depression or schizophrenia). Comparison between people with mental illness and those with BD did not reveal significant differences in ratings of sleep duration, but there were differences in sleep routines and sleep quality, with the first group reporting worse results. Four studies demonstrated more sleep disruptions and changes in patients with mental illness (schizophrenia or anxiety or depression or psychotic disorders) than people with BD and four others showed worse sleep quality in individuals with BD than healthy

controls. In general, it is observed that people with mental illness-especially with BD-showed worse sleep quality than healthy controls, but patients with BD did not have difficulties in sleep compared to those with depression, schizophrenia, psychotic disorders, and anxiety. **Conclusion:** As the evolution of Covid-19 still remains uncertain, it is essential to stay vigilant for warning indications of unhealthy daily routines, such as disordered sleep, in high-risk populations with psychiatric illnesses.

## Subject Areas

Psychology

## Keywords

Bipolar Disorder, Covid-19, Lockdown, Pandemic, Sleep

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## 1. Introduction

The coronavirus disease 2019 (Covid-19) pandemic, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), is an unprecedented and devastating situation, not only because of its immediate influence on people's lives, but also because of its impact on mental health [1] [2]. Strictly restrictive measures were taken to reduce the spread of the virus [3]. People with a pre-existing psychiatric pathology are a susceptible population, because they are at a greater risk of infection and of developing Covid-19 problems, than those who do not have a mental disorder [1] [2]. People with Bipolar Disorder (BD) are commonly particularly sensitive to factors that disrupt biological and social rhythms [4] [5], while measures are accounted essential to restrict the spread of SARS-CoV-2, such as lockdown, isolation, and quarantine, have the potential to influence behavior, lifestyle and disturb everyday patterns such as sleep schedules and the sleep-wake rhythm [6] [7].

BD is a chronic psychiatric disorder, characterized by alterations in mood state and energy. It affects approximately 1% - 5% of the world's population, regardless of gender, nationality, ethnicity, or socioeconomic status [8] [9]. BD is the leading cause of disability between the ages of 15 and 44, resulting in cognitive and functional impairment and increased mortality, especially death by suicide. Furthermore, BD is strongly associated with abnormalities in an individual's circadian rhythms and especially with sleep disruption [10] [11]. Specifically, difficulties in the initiation, maintenance, and timing of sleep are common among individuals living with BD. Sleep is necessary for the human organism and disturbances are observed in 69% of people with BD [12] [13]. Even though sleep changes in people with BD are referred in many articles, to our knowledge there is no systematic review that has investigated the impact of Covid-19 pandemic on the sleep quality in patients with BD. Therefore, the main purpose of

this review is to study this issue.

## 2. Methodology

### 2.1. Literature Search and Data Sources

This research was conducted according to Preferred Reporting Items for Systematic Review (PRISMA) guidelines [14]. Searching was limited to articles published between January 2019 and June 2022.

Data were extracted from the following electronic databases: PubMed and Scopus. We used the following search string in each database: (“bipolar disorder” OR “bipolar spectrum” OR “mood disorder”) AND (pandemic OR “Covid 19” OR lockdown OR quarantine OR “SARS CoV-2”) AND (sleep OR “circadian rhythms” OR “sleep disruption”). Each study’s title, keywords and abstract were screened for eligibility.

### 2.2. Inclusion and Exclusion Criteria

Inclusion criteria were the following: People with Bipolar spectrum Disorders in the period of Covid-19, as BD is defined by the American Psychiatric Association [15]. Studies had to be published within the last 3 years (2019-2022) and had to examine the impact of lockdown of Covid-19 on sleep quality.

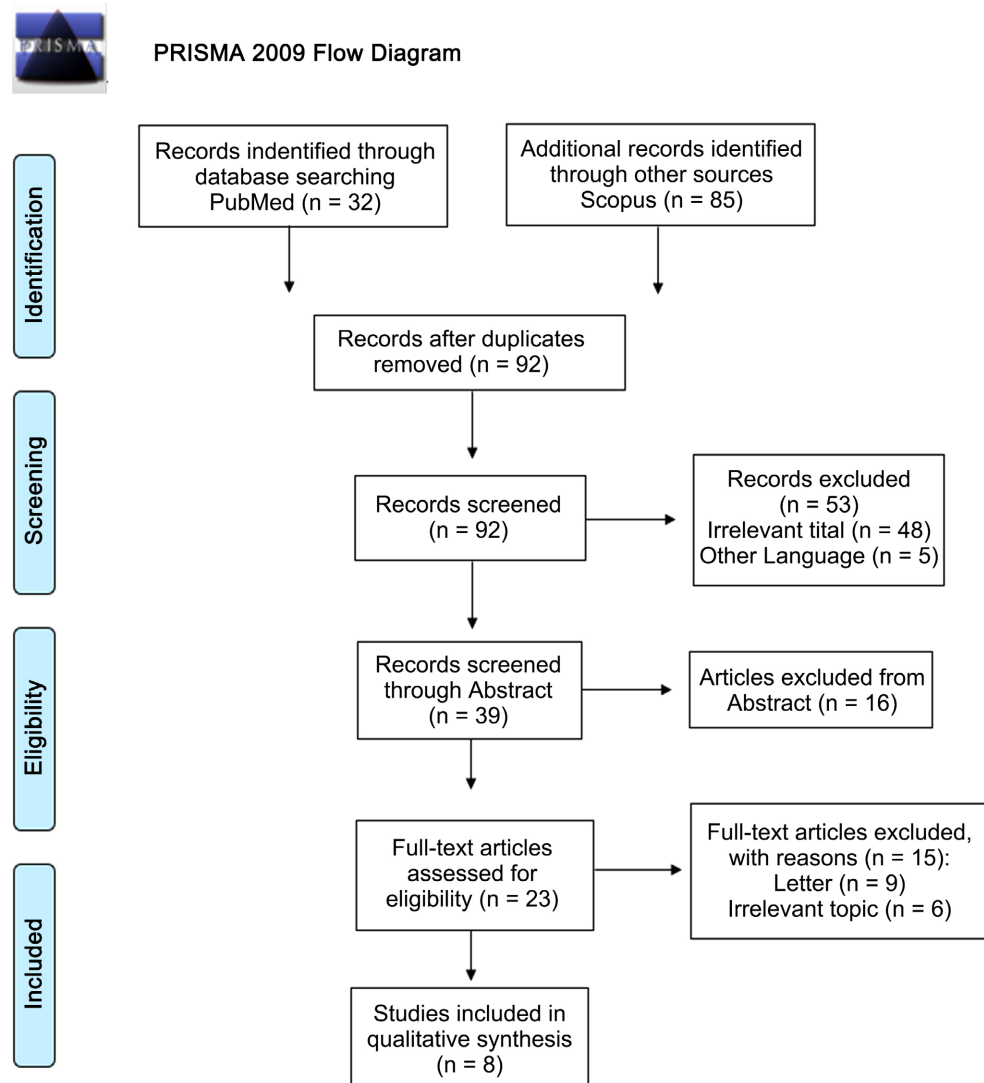
Exclusion criteria were the following: Papers published in other languages except for English, studies that focused on interventions and medication, studies that were not related to sleep, brief or case reports, commentaries and reviews.

### 2.3. Study Selection

The primary search was conducted by two researchers, M.L. and P.T.K. After the screening of titles, abstracts, and studies to determine eligibility, those that did not meet the criteria were excluded. Full texts of the remaining articles were analyzed, and some were excluded based on their content.

## 3. Results

A total of 117 papers was found in two databases (PubMed = 32, Scopus = 85). After removing duplicates, 92 articles were initially kept and screened by title, language and abstract. Of them, 53 articles were excluded. As a result, 39 full text articles were evaluated for eligibility as far as the above inclusion and exclusion criteria were concerned. Finally, after full text analysis, a total of 8 articles were included in this review. All of the included papers were observational studies. Specifically, 4 studies were longitudinal [12] [16] [17] [18] and 4 were cross-sectional [19] [20] [21] [22]. The flow diagram in **Figure 1** shows the process of study selection. Included studies focused on sleep disturbances, sleep behaviors, sleep routine changes, sleep quality, sleep latency, number of hours asleep per day, and sleep duration of people with BD during the period of Covid-19. Particularly, the papers retrieved evaluated how the circumstances with Covid-19 (lockdowns,



**Figure 1.** Flow chart of studies included in the review according to PRISMA guidelines.

quarantine and restrictions) affected sleep quality and quantity. The main characteristics of each study are presented in **Table 1**.

Four of the included studies were conducted in Europe, another one, both in Europe and Africa, one in Australia and the other two in America. In all studies, participants completed self-ratings of symptom severity and daily mood experiences, as well as assessments were conducted via telephone by a psychiatrist or psychologist with good knowledge of patients. Diagnoses were made in proportion to Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria.

A total of 2650 patients with BD were evaluated in the 8 studies, which were included in this systematic review and the preponderance of sample was composed of women. The mean age of participants was 42.02 years. Included studies reported an effect of the circumstances of Covid-19 on sleep efficacy, such as sleep quality and quantity.

**Table 1.** Characteristics of included studies.

Author and year	N	Sex		Age	Instrument	Comparison group and Outcome	Period
		Women	Men				
Sole B. <i>et al.</i> 2021 Spain- EUROPE	619 CC = 413 MI = 206 D/A = 50 BD/SCZ = 148 Only BD = 114	CC 433 70%	CC 171 27.6%	44.89 ( $\pm$ 14.04)	Online survey SCALES	<u><b>D/A vs BD/SCZ (sleep)</b></u> <b>Sleep disturbances:</b> D/A = 76% vs BD/SCH = 55.4% <b>No sleep troubles</b> (good sleep, wake up rested, relaxed): D/A = 20.0% vs BD/SCH = 21.6% <b>No sleep changes:</b> D/A = 4.0% vs BD/SCH = 23.0% <b>Sleep routine changes:</b> D/A = 16.0% vs BD/SCH = 14.9% <b>Going to bed:</b> <b>-Later-</b> D/A = 50.0% vs BD/SCH = 23.0%, p < 0.001 <b>-Earlier-</b> D/A = 4.0% vs BD/SCH = 8.8%, p = 0.364 <u><b>CC vs MI (sleep)</b></u> <b>Sleep changes: p = 0.004</b> <b>Sleep disturbances:</b> CC = 51.1% vs MI = 60.7% <b>No sleep troubles:</b> CC = 18.4% vs MI = 24.4% <b>No sleep changes:</b> CC = 30.5% vs MI = 18.0% <b>Going to bed:</b> <b>-Earlier-</b> MI = 7.3% vs CC = 1.9%, p = 0.001 <b>-Later-</b> MI = 30.1% vs CC = 20.3%, p = 0.007	May-June 2020
Van Rheenen TE. <i>et al.</i> 2020 Australia	4459 CC = 3167 MI (BD or DD) = 1292	CC 79.3%	SCZ 20.7%	42.95 ( $\pm$ 10.76)	Online survey Self-reported changes	<u><b>CC vs MI</b></u> <b>Change in sleep duration: p &lt; 0.001</b> <b>More:</b> CC = 26.4% vs MI = 35.6% <b>Less:</b> CC = 42.3% vs MI = 46.7% <b>No Change:</b> CC = 31.3% vs MI = 17.7%	April-June 2020
Pinkham AE. <i>et al.</i> 2020 Texas, San Diego, Miami-USA	148 SCZ = 92 vs BD = 55	MI 71.4%	CC 28.6%	42.26 ( $\pm$ 14.11)	EMA questionnaire	<u><b>Sleep in hours</b></u> <b>Pre lockdown</b> SCZ = 7.35 hours vs BD = 6.85 hours <b>During lockdown</b> SCZ = 7.01 hours vs BD = 7.06 hours	April-June 2020
Yocum A. <i>et al.</i> 2021 Michigan- USA	560 CC = 147 vs BD = 345	BD 69.28%	<60 70.31%	>=60 29.69%	PSQI	<u><b>BD vs CC</b></u> <b>BD &gt;30 min to fall asleep</b> (p = 0.0003) <b>BD worse sleep quality</b> (p = 0.0027) <b>BD more likely to take sleep medications</b> (p < 0.0001) <b>BD more hours of asleep per day</b> (p = 0.1812)	April-May 2020

## Continued

Carta MG. <i>et al.</i> 2021 Italy- EUROPE Tunisia- AFRICA	70 BD 40 in Italy 30 in Tunisia	BD Italy 28 12 70% 30%	Italy 48.57 ( $\pm$ 11.64) Tunisia 41.8 ( $\pm$ 13.22)	BRIAN scale	Italian sample showed worse scores regarding sleep, than Tunisian sample ( $p < 0.0001$ ).	April-June 2020
Fellendorf FT. <i>et al.</i> 2021 Austria- EUROPE	39 CC = 19 vs BD = 20	BD 10 10 50% 50%	BD 43.35 ( $\pm$ 15.55) CC 33.05 ( $\pm$ 9.66)	Online survey PSQI	<b>BD vs CC</b> <u>T1 (9-28 April 2020)</u> <b>BD scored worse sleep.</b> <b>Important differences in:</b> -sleep quality ( $p = 0.024$ ) -sleep latency ( $p = 0.045$ ) -daytime sleepiness ( $p = 0.007$ ) -the PSQI sum ( $p = 0.012$ ) -a tendency in sleep disorders ( $p = 0.092$ ).  <u>T2/Rerun (5 May 2020-4 June 2020)</u> <b>BD</b> scoring was still <b>higher</b> , but there was no meaningful differences to HC anymore ( $p = 0.192$ ).	April-June 2020
Dalkner N <i>et al.</i> 2022 Austria, Denmark, Germany- EUROPE	234 CC = 117 BD = 117	BD 78 39 (66.6%)(33.3%) CC 78 39 (66.6%)(33.3%)	BD 43.32 ( $\pm$ 13.17) CC 43.36 ( $\pm$ 13.82)	Online survey PSQI	<b>BD vs CC</b> <b>BD</b> scored higher in PSQI: 7.34 (BD) > 4.24 (CC) ( $p = 0.001$ )	May- September 2020
Elizabeth Ann Barrett <i>et al.</i> 2022 Norway- EUROPE	520 PsD = 75 BD = 445	BD 358 84 (80%) (19%) PsD 62 11 (83%) (15%)	BD 37.1 ( $\pm$ 12) PsD 35 ( $\pm$ 14)	Online survey PSQI	<b>BD vs PsD</b> <u>Insomnia symptoms:</u> -More/no change/less, n (%): 181 (41%)/ 236 (53%)/28 (6%) <b>vs</b> 31(41%)/36 (48%)/ 8 (11%) ( $p = 0.351$ ) <u>Troubling nightmares:</u> -More/no change/less, n (%): 108 (24%)/ 316 (71%)/21 (5%) <b>vs</b> 25 (33%)/46 (61%)/ 4 (5%) ( $p = 0.209$ ) Sleep duration before COVID-19 outbreak h, M: 8.7 <b>vs</b> 9.3 ( $p = 0.032$ ) Sleep duration after COVID-19outbreak h, M: 8.8 <b>vs</b> 9.2 ( $p = 0.259$ )	June-July 2020

CC = Community Controls; BD = Bipolar Disorder; SCZ = Schizophrenia; D = Depression; A = Anxiety; MI = Mental Illness; DD = Depression Disorder; PsD = Psychotic Disorders; PSQI = Pittsburg Sleep Quality Index.

Some studies compared healthy individuals to people with BD, other studies examined people with mental illness (BD vs. anxiety or depression or schizophrenia or psychotic disorders) and one compared patients with BD, who were living in different countries. Regarding the comparison between people with mental illness and those with BD, it seemed that groups did not differ in ratings of sleep duration, but there was a difference in sleep routines and sleep quality, with the first group demonstrating worse results [16] [19] [22]. Three studies demonstrated more sleep disruptions in patients with mental illness than healthy people [12] [19] [20].

Analytically, Sole B. and colleagues [19] investigated contingent differences regarding the effect of the Covid-19 pandemic and lockdown, between healthy controls and individuals with a mental disorder. There were two groups of psychiatric disorders that were compared: depression or anxiety disorders vs. BD and schizophrenia. Patients with mental illness described significantly more changes in sleep routine (*i.e.* going to bed earlier or later than usual) and sleep disturbance than controls. Regarding the main outcomes of sleep quality, patients with D and A reported significantly more changes in sleep routine, and more sleep disturbances BD and SCH. However, it is worth noting that both patients and controls mentioned high levels of sleep disturbances and two-thirds of the respondents reported changes in sleep.

In the second study, healthy people reported no changes in sleep, compared to patients with mental illness (BD or depressive disorder), who reported more sleep disruptions, since the pandemic started [20]. The mood disorder group showed higher psychological distress than the control group, with stress and depression being higher in responders with BD than in those with depressive disorder. Patients with BD were specifically concerned more about their daily routine and sleep, than patients with depressive disorder and those with no mental illness. Negative changes to lifestyle behaviors were more common in those with mood disorders and were associated with very high levels of distress. Compared to the patients with no mental illness disorder, a higher proportion of respondents with mood disorder reported experiencing more sleep disruptions, less reported no change, and more reported sleeping both more and less since the pandemic began.

In the third study [16], the sample was composed of individuals with BD and schizophrenia and pre-pandemic ratings of symptoms were compared to ratings that came up 2 - 4 months into the pandemic. It was supposed that patients would have bad mental health and lack of sleep, due to Covid-19 pandemic. As distinct from the expectations, results showed that there were no important changes in sleep duration pre and during lockdown. Furthermore, people with BD did not differ from those who suffered from schizophrenia.

The fourth study [17] compared the impact of the SAR-Cov-2 pandemic and lockdown on people with BD to community controls. Individuals with BD reported a stronger impact from the stay-at-home orders with disruptions in routines, such as sleep routine. It is noteworthy, that a significant alteration in the

quality of sleep over time, was not observed neither by patients with BD nor by community controls. However, it is noticed an increase in duration of sleep in the patients with BD, with an equivalent reduction in sleep duration in community controls. Individuals with BD reported that they need more than 30 min to fall asleep, worse sleep quality and were more prone to use sleep medicines than healthy controls.

Another study followed patients with BD, who lived in two nearby cities (Cagliari and Tunis), but with some differences regarding lockdown conditions. It needs to be mentioned that in Tunis the lockdown was less severe. The Italian sample was found to have more dysfunctional sleep scores than the Tunisian group [18].

During pandemic, Fellendorf and colleagues [12] examined sleep quality, using the Pittsburgh Sleep Quality Index (PSQI) and Covid-19 linked attitudes, phobias and emotional distress in 20 BD patients and 19 healthy controls. The study was carried out in April 2020 (t1), when extremely strict restrictions were declared, and was conducted again in May 2020 (t2), when they relaxed. The investigation showed that there were significant differences between the BD group and the community control group in sleep. At both time points (t1, t2), patients with BD showed poor sleep quality, sleep latency and daytime sleepiness, in comparison with community controls. It was observed that in May, patients with BD showed very high scores and they had worse quality of sleep, but there was no significant difference to community controls, due to the relaxation of strict restrictions. More information frequency and more Covid-19 concerns were associated with worse sleep components. Higher information frequency and higher Covid-19 concerns in April were observed to predict worse sleep characteristics in May in the BD group, such as sleep quality, sleep efficiency, sleep duration and daytime sleepiness [12].

Dalkner *et al.* [21] found that individuals with BD showed higher scores in PSQI compared to community controls. In people with BD, poorer sleep quality was related to emotional distress due to social distancing, during the COVID-19 pandemic, between May and September 2020. Individuals who had high levels of anxiety, severity of symptoms and sleep disturbances, it is possible to manifest fear for Covid-19, and adversely.

Lastly, Barret and colleagues [22] investigated the pandemic impact on well-being and mental health-including sleep-in people with bipolar and psychotic disorders. They found that participants with psychotic disorders had more insomnia symptoms than participants with bipolar disorders, they reported insomnia symptoms half of the nights and for many these had increased post outbreak. Troubling nightmares were less frequent, but one-in-four reported an increase. There were no pre-post changes in sleep duration.

## 4. Discussion

To the best of our knowledge, this is the first systematic review which analyzes



the existing literature regarding the effect of Covid-19 on the sleep of patients with BD, published between the years 2019 and 2021.

While sleep disturbance is one of the most common symptoms of sub-threshold BD and is frequently connected with subthreshold depression, sleep disruptions are also regarded a strong predictor of a mood swing in depression. The key to maintaining stability is to preserve a stable sleep-wake cycle [23] [24] [25].

The pandemic and the subsequent confinement affected significantly people's lives, because it is a universal public health issue, with a great impact on sleep and mental health [26] [27]. The lockdown and the changes of the daily routine can lead to disturbance of daily life rhythms and activities, which are very significant for people with BD in the pandemic period [28] [29]. These changes may disturb their sleep, because they are more sensitive due to mental illness. Lack of sleep can be the engine of relapse and it is possible to lead to manic symptoms [30]. Under normal circumstances, people with BD do not usually have social rhythm regularity and it is important to maintain stability in their sleep and schedule [31]. Therefore, in times of pandemic, individuals with BD may have worse outcomes [32]. Mood episodes may be increased due to sleep disturbances, resulting from stress and life disruption. In individuals with BD who have disturbed circadian rhythms the sleep disruption can be aggravating [33] [34].

People with mental illness compared to general population have more difficulty to implement some coping strategies in order to deal with the pandemic. Some recommendations for people with BD involve stress-management techniques, such as progressive muscle relaxation, diaphragmatic breathing, and meditation [35] [36] [37] [38]. There are some significant measures to deter relapse in people with mental illness, such as a consistent daily routine, agreeable and relaxing activities, more hours of sleep, staying in contact with mental health professionals and continuing prescribed medication. Moreover, the role of family and friends is notable for the support of patients and is needed to meet the needs of patients [39].

The findings of the current systematic review should be interpreted with caution due to some limitations. Firstly, the number of included studies was small, because the Covid-19 pandemic is relatively recent. Furthermore, in two of the studies' results cannot be generalized to all patients as they pertained to a voluntary online survey. Five studies used self-report questionnaires, which are not equal to clinical examination, and the results may have been influenced by report biases and objective conclusions cannot be reached with certainty. Finally, a significant limitation is that studies do not report whether participants with BD or other mental illnesses were receiving medication.

It is important to investigate further the contingent consequences of the Covid-19 pandemic on both the general population and, specifically, in patients with psychiatric disorders. It is useful to carry out longitudinal studies with larger samples and determine the pattern of effects overtime. Investigation in mental disease is required because this global situation has not been over yet and long-term mental health and functional implications are expected to worsen.

## 5. Conclusion

In conclusion, from this systematic review, it is observed that patients with mental illness, and especially patients with BD, showed more changes in sleep and worse sleep quality than healthy controls, but patients with BD did not have difficulties sleeping compared to those with depression and anxiety. It is critical to be cautious for signals of psychiatric disorder in high-risk groups by conducting early interventions, because the global socio-economic crisis and the progression of Covid-19 are still uncertain. Individuals with pre-existing mental illness are considered as susceptible population, due to cognitive deficits and poor insight, with a decreased capacity to adopt coping methods, increase unhealthy behaviors, aggravation of symptoms or relapses as a result [40].

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## Conflicts of Interest

The authors declare no conflicts of interest.

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