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# Mental health status of patients with bipolar disorder during COVID-19 lockdown: a cross-sectional study at El Khanka Psychiatric Hospital

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## Abstract

**Background** The COVID-19 pandemic necessitated a number of measures including lockdowns and social distancing. These measures affected mental health in healthy individuals and mentally affected patients. Studies examining the effectiveness of such strategies are still limited, and those with bipolar disorder (BD) are an especially vulnerable population. The current research aimed to evaluate the mental health status of BD patients throughout the pandemic, particularly as regards increasing the rate of relapse and appearance of other psychiatric comorbidities, and to evaluate and contrast the acute stress and psychological association experienced by persons with BD and those without mental diseases through the pandemic.

**Results** A total of 103 participants were involved in the study, 50 in the diseased group and 53 in the healthy group. Concerning demographic data, there was significant variation among the two groups concerning gender, marital status, education, employment, and socio-economic status. A study of COVID-19's association with psychometric data revealed a significantly higher score of IES-R in healthy participants compared to diseased. A comparison of COVID-19-affected patients and COVID-19-not affected patients revealed a statistically significant association between the IES-R median score result and COVID-19 effects.

**Conclusion** There was no significant distinction between healthy and diseased groups concerning scales of depression, anxiety, or insomnia. However, COVID-19 pandemic significantly affected routine life stress and acute stress measured by IES-R.

**Keywords** Bipolar disorder, COVID-19

## Introduction

In response to a severe global catastrophe, the World Health Organization (WHO) proclaimed COVID-19 a global pandemic on March 11, 2020 [1]. Local health authorities take a number of steps to stop the spread of

infection, with social isolation and lockdown being of utmost importance [2]. Such an executive order was viewed from an epidemiological and public health standpoint as a crucial step in controlling disease by restricting population movement, which would reduce the spread of infection [3].

Social support is one of the key elements in maintaining health and wellbeing, and social isolation frequently has a negative association with both mental and physical health. Limited social support and social isolation are common exaggerating factors for those who live with persistent mental illness [4]. Bipolar disorder patients are

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frequently susceptible to factors that upset biological and social rhythms, and SARS-CoV-2 containment tactics including lockdowns, social isolation, home confinement, and quarantine have the potential to disturb daily patterns and subsequently mental health [5].

Bipolar disorder (BD) is a recurrent chronic psychiatric condition marked by changes in energy levels and mood [6], and it can make patients more sensitive to stress than healthy controls. According to studies, people with BD are more likely to experience severe depressive episodes when there is a lot of ongoing stress [7]. Men with BD experienced much higher levels of depression than women with BD, and patients with BD reported higher levels of stress. Compared to people who did not have a mental problem, patients expressed greater concern about COVID-19's financial implications [8].

The current research aimed to evaluate both the mental health status of BD patients during the pandemic, particularly as regards the increase in the rate of relapse and appearance of other psychiatric comorbidities, and the psychological associations experienced by patients with bipolar disorder and people without psychiatric illnesses during the pandemic.

## Methods

This cross-sectional research was performed at outpatient clinics in El-Khanka Mental Health Hospital, Cairo, Egypt, during 8-month intervals starting from August 2021 to March 2022. A simple random sample of 50 bipolar affective disorder adult patients was included in addition to 53 adult healthy individuals. Enrolled patients were in remission of bipolar episodes for 3 months with a Young Mania Rating Scale < 7. Participants with intellectual disability, other psychiatric disorders, another neurological disorder, or who refused to participate were excluded from the study.

The control group was recruited from El-Khanka Mental Health Hospital, Cairo, Egypt, matching the same sociodemographic data. They were recruited from workers in the hospital and their relatives.

After obtaining informed verbal consent, patients were assessed for the severity of their manic state utilizing Young Mania Rating Scale (YMRS) [9]; the Clinical Interview Scale is mainly employed for research to evaluate the severity of manic states. The scale consists of eleven items, and the objective of each item is to determine the severity of the abnormality in the patient, making it useful for evaluating manic symptoms continuously. Four items (irritability, speech, thought content, and disruptive/aggressive behavior) are evaluated on a 0 to 8 scale, while the remaining seven are graded on a 0 to 4 scale. The Arabic version was used in [10].

After that patients and healthy participants were assessed using a semi-structured sheet of the socio-demographic data and background related to the COVID-19 pandemic: history of catching COVID-19 (suspected or confirmed), loved one catching COVID-19, loved one dying from COVID-19, social isolation and social distancing, availability of food and medicines, availability of high-quality medical care, risk of unemployment or reduced employment, travel restrictions, personal finances, balancing work and caring for children/dependents, adapting to work from home, domestic violence and others.

Diagnosis of any psychiatric disorders was done using a Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I) [11]; this version of SCID-I is compatible with DSM-IV. Clinical and demographic information is provided first. Then, there are 7 diagnostic modules tailored to certain diagnostic areas, such as mood, psychotic, substance addiction, anxiety, somatoform, eating, and adjustment disorders. There are both required and optional probes, and skip-outs are permitted when no further inquiry is necessary. It is widely utilized in various forms of psychiatric research and is regarded as the standard interview for the purpose of confirming a diagnosis in clinical trials. The Arabic version was applied in [12].

Hamilton Depression Rating Scale (HAM-D) [13], Arabic version was applied in [14], for assessing symptoms of depression.

Taylor Manifest Anxiety Scale (TMAS) [15], Arabic version was applied in [16] for assessing the severity of the anxiety state.

Impact of Event Scale-Revised (IES-R) [17] for measuring posttraumatic stress disorder (PTSD). We used the Arabic version translated by the researcher.

Finally, The insomnia Severity Index (ISI) [18] for the evaluation of insomnia and its severity. We used the Arabic version translated by the researcher.

## Statistical analysis

Utilizing Statistical Package for Social Science (SPSS 25), the collected data were revised, tabulated, coded, as well as uploaded to a computer. For parametric numerical data, the means  $\pm$  SD, and range were utilized, whereas for non-parametric numerical data, the median and interquartile range (IQR) were employed, along with frequency and percentage for non-numerical data. Student *t* test was utilized to determine the statistical significance of the distinction between the means of the two groups. A non-parametric distinction among the two study groups was tested for statistical significance utilizing the Mann-Whitney test (*U* test). The correlation among the two qualitative factors was analyzed utilizing

the Chi-Square test. Since over twenty percent of the cells have an expected count of below 5, Fisher’s exact test was performed to analyze the association between the two qualitative variables. The statistical significance of a disparity among two measurements of the same ordinal variable (score) for the same research group was determined utilizing the Wilcoxon signed-rank test. The McNemar test was applied to determine whether or not there was a statistically significant distinction between two measurements of a qualitative variable for the same research group. where  $p > 0.05$ : non-significant;  $p < 0.05$ : significant;  $p < 0.01$ : highly significant.

**Results**

**Clinical and demographic information about the research participants**

A total of 103 participants were included in the research, 50 were individuals with bipolar disorder and 53 were healthy participants. The mean age among the healthy group was  $38.21 \pm 10.5$ , and among the bipolar group was  $38.42 \pm 10.59$ , there was no statistical variation in age among diseased and healthy groups. There was a statistically significant difference in sex, 50.94% of the healthy group were males, and 49.06% were females.

Regarding the bipolar group, 72% were males, and 28% were females ( $p$  value = 0.028). There was a significant distinction in marital status ( $p$  value = 0.024), education ( $p$  value < 0.001), employment state ( $p$  value < 0.001), and socioeconomic state ( $p$  value = 0.043) among healthy and diseased groups as demonstrated in Table 1.

**COVID-19 association with psychometric data including YMRS, TMAS, HAM-D, ISI, and IES-R**

The median score of the YMRS among bipolar patients was 2 (0–4) indicating remission of manic symptoms during the study. Comparison of TMAS, HAM-D, and ISI among diseased and healthy groups revealed no statistically significant difference. Comparison of IES-R revealed significantly higher scores in healthy compared to bipolar patients ( $p$  value = 0.046), however, the median score was 1 in healthy and zero in bipolar reporting no PTSD-like symptoms in either group (Table 2). Comparison of degrees of severity of YMRS, TMAS, HAM-D, ISI, and IES-R revealed no statistically significant difference between healthy and diseased (Table 3).

Comparison of COVID-19-affected participants among diseased and healthy populations regarding median score (Table 4) and degrees of severity (Table 5) of YMRS,

**Table 1** Socio-demographic data among bipolar disorder cases and healthy ones

Whole group		Group		Test of significance		
		Healthy	Bipolar	Value	p value	Sig.
		Mean ± SD N (%)	Mean ± SD N (%)			
Age		38.21 ± 10.5	38.42 ± 10.59	$t = -0.102$	0.919	NS
Sex	Male	27 (50.94%)	<b>36 (72%)</b>	$\chi^2 = 4.802$	0.028	<b>S</b>
	Female	26 (49.06%)	14 (28%)			
Marital state	Single	7 (13.21%)	12 (24%)	Fisher’s exact test	0.024	<b>S</b>
	Married	<b>41 (77.36%)</b>	30 (60%)			
	Divorced	1 (1.89%)	7 (14%)			
	Widowed	4 (7.55%)	1 (2%)			
Education	Illiterate	2 (3.77%)	5 (10%)	Fisher’s exact test	< 0.001	<b>S</b>
	Basic education	9 (16.98%)	<b>27 (54%)</b>			
	Secondary education	18 (33.96%)	13 (26%)			
	Higher education	<b>24 (45.28%)</b>	5 (10%)			
Current residency	Rural	38 (71.7%)	37 (74%)	$\chi^2 = 0.069$	0.793	NS
	Urban	15 (28.3%)	13 (26%)			
Employment state	Not working	11 (20.75%)	<b>23 (46%)</b>	$\chi^2 = 30.424$	< 0.001	<b>S</b>
	Worker	4 (7.55%)	15 (30%)			
	Skilled	8 (15.09%)	8 (16%)			
	Employee	<b>30 (56.6%)</b>	4 (8%)			
Socioeconomic state	Low	8 (15.09%)	16 (32%)	$\chi^2 = 4.114$	0.043	<b>S</b>
	Moderate	<b>45 (84.91%)</b>	34 (68%)			
Medical comorbidities	No	40 (75.47%)	43 (86%)	$\chi^2 = 1.823$	0.177	NS
	Yes	13 (24.53%)	7 (14%)			

**Table 2** Comparison of psychometric data including YMRS, TMAS, HAM-D, ISI, and IES-R median scores

Whole group	Group		Mann-Whitney test		
	Healthy	Bipolar	z	p value	Sig.
	Median (IQR)	N (%) Median (IQR)			
YMRS score		2 (0–4)			
TMAS score	13 (9–20)	15 (9–23)	– 0.773	0.440	NS
HAM-D score	4 (1–7)	3 (1–6)	– 0.139	0.889	NS
ISI score	1 (1–8)	3 (1–5)	– 0.230	0.818	NS
IES-R score	1 (0–7)	0 (0–2)	– 1.998	0.046	5

TMAS, HAM-D, ISI, and IES-R revealed no statistically significant difference.

Comparison of COVID-19-affected bipolar and COVID-19 not affected bipolar revealed a statistically significant association between IES-R median score result and COVID effects (*p* value = 0.042) (Table 6). No significant correlation was detected regarding median

scores of YMRS, TMAS, HAM-D, and ISI (Table 6). Moreover, no significant correlation was detected regarding the degree of severity of YMRS, TMAS, HAM-D, ISI, and IES-R (Table 7).

In the multivariate regression analysis including these 5 factors, the not working state remained independent factors affecting the mental health status (Table 8).

**Discussion**

Numerous research has reported on the general population’s mental health in connection to COVID-19 in various nations. This cross-sectional trial aimed to evaluate the mental health status of BD patients during the pandemic, particularly as regards increasing the rate of relapse and appearance of other psychiatric comorbidities, and to evaluate and compare the immediate stress and psychological associations experienced by patients with BD and people without psychiatric illnesses during the pandemic. The patients were recruited from El-Khanka Mental Health Hospital, outpatient clinics. In our study, A total of 103 participants were separated into

**Table 3** Comparison of psychometric data including YMRS, TMAS, HAM-D, ISI, and IES-R degrees of severity

		Healthy		Bipolar		Chi-square test		
		N	%	N	%	Value	p value	sig.
TMAS categories	Not anxious (0–16)	31	<b>58.5%</b>	28	<b>56.0%</b>	$\chi^2 = 0.53$	0.511	NS
	Mild anxiety (17–20)	9	17.0%	5	10.0%			
	Moderate anxiety (21–26)	6	11.3%	9	18.0%			
	Severe anxiety (27–29)	3	5.7%	2	4.0%			
	<b>Very severe anxiety (30–50)</b>	4	<b>7.5%</b>	6	<b>12.0%</b>			
HAM-D-7 result	full remission ( $\leq 3$ )	25	47.2%	26	52.0%	$\chi^2 = 0.24$	0.624	NS
	Non\ partial remission ( $\geq 4$ )	28	52.8%	24	48.0%			
ISI result	No insomnia (0–7)	39	73.6%	43	86.0%	$\chi^2 = 2.88$	0.101	NS
	Subthreshold insomnia (8–14)	10	18.9%	6	12.0%			
	Moderate insomnia (15–21)	4	7.5%	1	2.0%			
IES-R result	No PTSD (0–23)	53	100.0%	50	100.0%	NA		

**Table 4** YMRS, TMAS, HAM-D, ISI, and IES-R median scores among COVID-19-affected groups in both healthy and diseased

Affected by COVID	Group		Mann-Whitney test		
	COVID group without bipolar (N = 46)	COVID group among patients with bipolar (N = 26)	z	p value	Sig.
	Median (IQR)	N (%) Median (IQR)			
YMRS score		2 (0–4)			
TMAS score	<b>13 (9–22)</b>	<b>14 (9–22)</b>	– 0.282	0.778	NS
HAM-D score	4 (1–7)	3.5 (2–6)	– 0.047	0.962	NS
ISI score	<b>1.5 (1–8)</b>	<b>3 (2–5)</b>	– 0.408	0.683	NS
IES-R score	1 (0–9)	1 (0–2)	– 0.719	0.472	NS

**Table 5** TMAS, HAM-D, ISI, and IES-R degrees of severity among COVID-19-affected groups in both healthy and diseased

Affected by COVID		COVID group without bipolar (N = 46)		COVID group among patients with bipolar (N = 26)		Chi-square test		
		N	%	N	%	Value	p value	sig.
TMAS categories	Not anxious	29	63.0%	16	61.5%	$\chi^2 = 0.03$	0.926	NS
	Mild anxiety	5	10.9%	3	11.5%			
	Moderate anxiety	6	13.0%	4	15.4%			
	Severe anxiety	3	6.5%	0	0.0%			
	<b>Very severe anxiety</b>	3	<b>6.5%</b>	3	<b>11.5%</b>			
HAM-D-7 result	full remission	22	47.8%	13	50.0%	$\chi^2 = 0.03$	0.859	NS
	Non\ partial remission	24	52.2%	13	50.0%			
ISI result	No insomnia	34	73.9%	23	88.5%	$\chi^2 = 1.59$	0.275	NS
	Subthreshold insomnia	9	19.6%	2	7.7%			
	Moderate insomnia	3	6.5%	1	3.8%			
IES-R result	No PTSD	46	100.0%	26	100.0%	NA		

**Table 6** Comparison of YMRS, TMAS, HAM-D, ISI, and IES-R median scores among the bipolar group affected and not affected by COVID-19

Bipolar group	Affected by COVID		Test of significance		
	No	Yes	Value	p value	Sig.
	N (%) Median (IQR)	N (%) Median (IQR)			
YMRS score	2 (0–4)	2 (0–4)	$z = -0.188$	0.851	NS
TMAS score	17 (9.5–25)	14 (9–22)	$z = -0.729$	0.466	NS
HAM-D score	3 (1–6)	3.5 (2–6)	$z = -0.391$	0.696	NS
ISI score	2 (0.5–5.5)	3 (2–5)	$z = -0.932$	0.351	NS
IES-R score	0 (0–1.5)	<b>1 (0–2)</b>	$z = -2.029$	0.042	<b>S</b>

**Table 7** Comparison of TMAS, HAM-D-7, ISI, and IES-R degrees of severity among the diseased group affected and not affected by COVID-19

Among BP		Not affected by COVID		Affected by COVID		Chi-square test		
		N	%	N	%	Value	p value	sig.
TMAS categories	Not anxious	12	<b>50.0%</b>	16	<b>61.5%</b>	$\chi^2 = 0.83$	0.375	NS
	Mild anxiety	2	8.3%	3	11.5%			
	Moderate anxiety	5	20.8%	4	15.4%			
	Severe anxiety	2	8.3%	0	0.0%			
	Very severe anxiety	3	12.5%	3	11.5%			
HAM-D-7 result	full remission	13	54.2%	13	50.0%	$\chi^2 = 0.09$	0.768	NS
	Non/partial remission	11	45.8%	13	<b>50.0%</b>			
ISI result	No insomnia	20	83.3%	23	<b>88.5%</b>	$\chi^2 = 0.01$	1.000	NS
	Subthreshold insomnia	4	16.7%	2	7.7%			
	Moderate insomnia	0	0.0%	1	3.8%			
IES-R result	No PTSD	24	100.0%	26	100.0%	NA		

**Table 8** Multivariate logistic regression analysis of multiple variables

Variables	OR (95% CI)	P value
Sex, female	1.13 (0.7–1.22)	0.054
Marital status, married	1.43 (0.67–1.27)	0.067
Social class, low	1.21 (0.20–2.62)	0.09
Education, low	1.20 (0.97–1.92)	0.053
Employment state, not working	1.70 (1.20–3.62)	0.023

2 groups: BD patient group (50 participants) and healthy group (53 participants).

As regards the demographic data, there was no significant variation concerning age. However, regarding sex and marital status, there was a significant disparity between diseased and healthy groups. In this research, 77.36% of the controls were married in comparison with only 60% of the bipolar patients which can be attributed to the effect of mental illness in the patient group and this is in line with the concept that patients with BD in general, those with fewer social interactions and a smaller social network are less likely to achieve social milestones such as marriage [19].

Additionally, there was a significant distinction in education, employment status, and socioeconomic state among diseased and healthy groups. This was in accordance with Mitchell et al., who reported the marked commonalities of the socio-demographic characteristics of lower rates of marriage, employment, and resided in rural areas among patients with BD than the general population [20].

As regards the psychometric data, The primary findings of this research demonstrate that during the COVID-19 pandemic and lockdown, most of the cases did not suffer insomnia, anxiety disorder, or depression in both groups, nevertheless, 11.3% of the healthy group had moderate level anxiety compared with 18% of the diseased while 12% of the individuals had very severe anxiety episodes in contrast to 7.5%. On the contrary, 86% of the cases did not suffer insomnia compared with 73.6% of the healthy group, which was similar to the results obtained among diseased and healthy groups affected by COVID-19.

The results of Koenders et al. were similar to ours where out of 70 BD individuals, a significant elevation in hypo-manic symptoms from baseline during the 1st COVID-19 wave, along with a reduction afterward with positive coping throughout the following months when lockdown measures were eased. Depression as well as stress signs did not differ significantly over time [21]. Another study by Dalkner et al. contradicted ours that cases with BD are more prone to depression and somatization than healthy adults and that distress resulting

from social isolation can worsen the symptoms of BD. In addition, the study has pointed to the correlation between emotional distress and anxiety in BD patients by 26% while in healthy adults they showed only an 11% correlation [22].

In another study comparing healthy volunteers to patients with mental illnesses (including; depression and anxiety versus bipolar patients), 413 healthy controls and 206 patients were included. Patients who suffered depression and anxiety were more susceptible to psychological distress and negative prospects about the future, and grieved sleeping when compared to bipolar and schizophrenic patients, whereas reported to research more [23]. On the contrary, another study has analyzed the effect of COVID-19 on sleeping quality in patients with BD to conclude that BD patients reported generally poor quality of sleep. Subjective sleep quality, sleep latency, daytime sleepiness, as well as Pittsburgh Sleep Quality Index (PSQI) sum, were inferior in BD patients contrasted with healthy controls [24].

Our study showed that a comparison of COVID-19-affected bipolar and COVID-19 not affected bipolar revealed a statistically significant association between IES-R median score result and COVID effects ( $p$  value = 0.042).

In agreement with our study, Abdelghani et al. found that the prevalence of moderate-to-severe PTSD symptoms among COVID-19 survivors is 72% (compared to 53% among the control subjects). Compared to the control group, the COVID-19 survivors had significantly increased levels of all PTSD symptoms. The affected symptoms were avoidance ( $P$  value = 0.006), intrusion ( $P$  value = 0.042), hyperarousal ( $P$  value < 0.001), and total IES-R score ( $P$  value = 0.011). Even after being adjusted for associated anxiety and depressive symptoms, the COVID-19 survivors, compared to the control subjects, had greater odds of hyperarousal symptoms ( $P$  value < 0.001, OR 0.3, 95% CI 0.2–0.5), and total IES-R score ( $P$  value = 0.015, OR 1.03, 95% CI 1.01–1.05) [25].

### Limitations

The controversy in our results could be interpreted by the unclear difference (regarding the definition of mental status) in ISI, IES-R, and HAMD-7 as well as TMAS due to the small sample size or it might be due to the incompletion of the cases under the study with social distancing as well as low social isolation during the pandemic lockdown. Additionally, our participants from BD patients were selected to be in remission of bipolar episodes for 3 months with the Young Mania Rating Scale < 7.

## Conclusion

There was no significant variation among healthy and diseased groups regarding scales of depression, anxiety, or insomnia. However, the COVID-19 pandemic significantly affected routine life stress and acute stress measured by IES-R.

## Abbreviations

WHO	World Health Organization
BD	Bipolar disorder
YMRS	Young Mania Rating Scale
SCID-I	Structured Clinical Interview for DSM-IV Axis I Disorders
HAM-D	Hamilton Depression Rating Scale
TMAS	Taylor Manifest Anxiety Scale
IES-R	Impact of Event Scale-Revised
PTSD	Posttraumatic Stress Disorder
ISI	Insomnia Severity Index

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## Authors' contributions

H.E. helped design the study, analyzed and interpreted the data, and revised the paper. R.H.E. designed, analyzed, and interpreted the study. F.F.G. interpreted the results and wrote and edited the manuscript. MYB recruited, investigated, and collected all patient data. The final manuscript was read and approved by all authors.

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## Availability of data and materials

All data generated or examined during the course of this research are involved in the published work.

## Declarations

### Ethics approval and consent to participate

All of the participants gave their written informed permission after receiving an explanation of the goal of the experiment and its limits. The search was carried out in a manner that was in conformity with the recommendations provided by the Institute of Psychiatry's Research and Ethics Committee at Ain Shams University.

### Consent for publication

Not applicable.

### Competing interests

The authors declare that they have no competing interests.

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