



**PHYSICAL ACTIVITY, PSYCHIATRIC SYMPTOMS IN INDIVIDUALS WITH SEVERE MENTAL DISORDERS AND THE COVID-19 PANDEMIC**

**ATIVIDADE FÍSICA, SINTOMAS PSIQUIÁTRICOS EM INDIVÍDUOS COM TRANSTORNOS MENTAIS GRAVES E A PANDEMIA DE COVID-19**

**ACTIVIDAD FÍSICA, SÍNTOMAS PSIQUIÁTRICOS EN PERSONAS CON TRASTORNOS MENTALES GRAVES Y LA PANDEMIA DE COVID-19**



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## ABSTRACT

The COV-SARS 2 pandemic led to setbacks for mental health of those with severe mental illness (SMI), chronic conditions responsible for significant morbidity and mortality rates. Physical activity is a well-known effective intervention in the treatment for various medical conditions. This study investigated the relationship between physical activity and anxiety, depressive and Post-Traumatic Stress Disorder (PTSD) symptoms in patients with bipolar disorder (BD), schizophrenia (SCZ), and schizoaffective disorder during the COV-SARS 2 pandemic. Data collection was conducted through questionnaires and scales administered to patients attending a specialized psychiatry outpatient clinic in Brazil from May 2021 to July 2022. In total, 201 individuals participated in the interviews. Statistical analyses showed a prevalence of probable anxiety disorder at 28%, depressive disorder at 34%, and PTSD at 17%. Feeling exposed to stressful media news and having any psychiatric comorbidity were associated to high levels of anxiety and depressive symptoms. Lower rates of anxiety and depressive symptoms were associated with engaging in physical activity. This study suggests that physical activity is a protective factor against the manifestation of symptoms and demonstrates the ongoing need for mental health care for individuals with SMI.

**Keywords:** COVID-19. Physical activity. Mental disorders. Anxiety. Depression.

## RESUMO

A pandemia de SARS-CoV-2 trouxe retrocessos para a saúde mental de pessoas com transtornos mentais graves (TMG), condições crônicas responsáveis por taxas significativas de morbidade e mortalidade. A atividade física é uma intervenção amplamente reconhecida como eficaz no tratamento de diversas condições médicas. Este estudo investigou a relação entre a atividade física e os sintomas de ansiedade, depressão e transtorno de estresse pós-traumático (TEPT) em pacientes com transtorno bipolar (TB), esquizofrenia (EZ) e transtorno esquizoafetivo durante a pandemia de SARS-CoV-2. A coleta de dados foi realizada por meio de questionários e escalas aplicados a pacientes atendidos em um ambulatório especializado em psiquiatria no Brasil, entre maio de 2021 e julho de 2022. Ao todo, 201 indivíduos participaram das entrevistas. As análises estatísticas revelaram uma prevalência de provável transtorno de ansiedade em 28%, transtorno depressivo em 34% e TEPT em 17%. Sentir-se exposto a notícias estressantes na mídia e apresentar comorbidades psiquiátricas foram fatores associados a níveis elevados de sintomas ansiosos e depressivos. Menores índices desses sintomas foram associados à prática de atividade física. Este estudo sugere que a atividade física atua

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como fator de proteção contra a manifestação de sintomas e reforça a necessidade contínua de cuidados em saúde mental para indivíduos com TMG.

**Palavras-chave:** Atividade Física. Transtornos Mentais. COVID-19. Ansiedade. Depressão.

## RESUMEN

La pandemia de SARS-CoV-2 ha afectado negativamente la salud mental de las personas con trastornos mentales graves (TMG), enfermedades crónicas responsables de tasas significativas de morbilidad y mortalidad. La actividad física es una intervención ampliamente reconocida como eficaz en el tratamiento de diversas afecciones médicas. Este estudio investigó la relación entre la actividad física y los síntomas de ansiedad, depresión y trastorno de estrés postraumático (TEPT) en pacientes con trastorno bipolar (TB), esquizofrenia (SZ) y trastorno esquizoafectivo durante la pandemia de SARS-CoV-2. La recopilación de datos se realizó mediante cuestionarios y escalas aplicadas a pacientes atendidos en una clínica ambulatoria especializada en psiquiatría en Brasil, entre mayo de 2021 y julio de 2022. Un total de 201 personas participaron en las entrevistas. Los análisis estadísticos revelaron una prevalencia de probable trastorno de ansiedad en el 28%, trastorno depresivo en el 34% y TEPT en el 17%. Sentirse expuesto a noticias estresantes en los medios y tener comorbilidades psiquiátricas fueron factores asociados con altos niveles de síntomas de ansiedad y depresión. La actividad física se asoció con una menor incidencia de estos síntomas. Este estudio sugiere que la actividad física actúa como un factor protector contra la manifestación de los síntomas y refuerza la necesidad continua de atención de salud mental para las personas con EMG.

**Palabras clave:** Actividad física. Trastornos mentales. COVID-19. Ansiedad. Depresión.

## INTRODUCTION

In December 2019, COV-SARS 2 emerged as a new strain of coronavirus and has since evolved with variants, such as "Omicron", which already has over 50 mutations<sup>1</sup>. Its clinical manifestations ranged from mild flu-like syndromes to severe and potentially fatal illnesses, such as acute respiratory syndrome (SARS)<sup>2</sup>, which occurred more frequently before vaccination<sup>3</sup>. Furthermore, the COV-SARS 2 pandemic led to devastating setbacks for global health and social programs, and its psychological impact in mental health remains still partially unknown<sup>4</sup>.

Most studies conducted shortly after the outbreak of the COV-SARS 2 pandemic sought to understand its effect on the mental health of the general population and revealed that mood swings and disturbances in the sleep-wake cycle were the most described symptoms<sup>2</sup>. Additionally, a higher prevalence of symptoms of anxiety, depression, and Post-Traumatic Stress Disorder (PTSD) were also identified in the general population<sup>5</sup>. When it comes to patients with severe mental illness (SMI) facing pandemic mitigation measures and its correlated stress, there was also a greater vulnerability to decompensation and a higher prevalence of suicidal ideation compared to the pre-pandemic period<sup>6-8</sup>. In fact, factors such as prolonged confinement, the prevalence of coronavirus cases in individuals' areas of residence, and the number of acquaintances or family members who have died, have been associated with the presentation of symptoms in the general population<sup>2,4,9</sup> and in specific groups, such as young people, students and healthcare professionals<sup>10-12</sup>. However, few studies have addressed psychiatric symptoms and potential protective factors in individuals with a previous psychiatric diagnosis of bipolar disorder (BD), schizophrenia (SCZ), and schizoaffective disorder<sup>7,8</sup>.

Previous research into protective factors for mental health in the pandemic focused mostly on socioeconomic factors and clinical comorbidities. However, few focused on physical activity<sup>13,14</sup>. Physical activity is a well-known independent - and modifiable - protect factor for many conditions, such as metabolic syndrome and cardiovascular disease in the general population<sup>15</sup>. Moreover, physical activity has been previously pointed as an effective intervention in the treatment of mood disorders and SCZ<sup>16,17</sup>, associated with less depressive symptoms, better quality of life and increased functioning<sup>18</sup>.

In the pandemic context, with an important sense of loneliness and restrictions to social interaction, low physical activity levels were associated with decreased mental health in adults<sup>2,19</sup>. Meanwhile, no studies investigated physical activity and its relation to psychiatric symptoms in people with BD, SCZ and schizoaffective disorder simultaneously during the COV-SARS 2 pandemic. Thus, the present study is pioneering in this evaluation,

aiming to assess the correlation of physical activity and the presence of symptoms of anxiety, depression, and PTSD in individuals with BD, SCZ, and schizoaffective disorder. It utilizes specific scales for each group of symptoms and aims to describe other possible variables associated with these outcomes during the COV-SARS 2 pandemic.

## METHODS

### SUBJECTS

Individuals with BD, SCZ and schizoaffective disorder who had regular follow-up at the Program of Mood and Anxiety Disorders (CETHA) and the SCZ outpatient clinic were invited to participate in this study. These participants were registered at the Psychiatry Service of the Professor Edgard Santos University Hospital, Federal University of Bahia (HUPES-UFBA), which is affiliated with the Brazilian Company of Hospital Services (EBSERH) in Salvador, Bahia, Brazil.

Data collection was conducted from May 2021 to July 2022. The protocols were administered on days of predetermined clinical appointments by the research team (CD; AR and VF) and lasted about 30 minutes. All patients diagnosed with BD, SCZ, and schizoaffective disorder, according to diagnostic criteria of the International Classification of Diseases (ICD- 10, 1994) and the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV, 1994), who attended the psychiatry outpatient clinics of HUPES-UFBA, aged 18 years or older, were included in this study. Individuals who were not mentally capable of responding at the time of the interview, had additional mental disorder diagnoses, or experienced cognitive impairment hindering their comprehension and response to the protocol questions were excluded from the study.

### INSTRUMENTS

Data collection was performed through self-administered questionnaires, either in person or sent virtually via the Survey Monkey platform to all those who agreed to participate in the study. Although a virtual option was provided, none of the participants chose to utilize it. The following instruments were utilized: 1) A questionnaire encompassing sociodemographic and clinical data, including type of mental illness, sex, age, marital status, occupation, education level, income, race, duration of mental illness, psychiatric comorbidities, clinical comorbidities, engagement in physical activity (if over 150 minutes per week) for at least 6 months, among others; 2) The General Anxiety Disorder-7 scale (GAD-7)<sup>20,21</sup> to evaluate anxiety symptoms; 3) The Patient Health Questionnaire-9 (PHQ-9)<sup>22,23</sup> to assess depressive symptoms; 4) The Posttraumatic Stress Disorder Checklist for

DSM-5 (PCL-5)<sup>24,25</sup> to measure the effects of various types of traumatic experiences; 5) The COV-SARS 2 Exposure Scale (a modified version of the Traumatic Exposure Severity Scale based on DSM-IV criteria for PTSD)<sup>26</sup> to evaluate the magnitude of impact, which includes items coded as yes or no for the following exposures: a) Having been infected with COV- SARS 2; b) Infected individuals in the neighborhood; c) Perception of living in a higher-risk area; d) Infected individuals at home; e) Knowing someone outside the household who was infected; f) Knowing someone who died from COV-SARS 2; g) Item related to subjective fear of contamination; h) Exposure to stressful media news. Except for the COV-SARS 2 Exposure Scale, all instruments applied are validated for use in the Brazilian population.

All procedures were approved by the ethics committee of this hospital, in the Plataforma Brazil (protocol number 5118514), and followed the guidelines of the Helsinki Declaration/2013 and Resolution 196/96 on research involving human subjects of the National Health Council. All patients received information about the research and were interviewed only after signing the Informed Consent Form (ICF).

## STATISTICAL ANALYSIS

The data were inputted and analyzed using the Statistical Package for Social Sciences software version 26.0 (SPSS, Chicago, IL, USA). All analyses were conducted using R software version 4.2.2. Categorical variables were described using frequencies, and continuous variables were described using median and interquartile range. The association between the scores of the GAD/PHQ/PCL-C scales and the variables used to assess COV-SARS 2 exposure was evaluated using multiple linear regression. Variables with  $p < 0.05$  in the linear regression were included in the full model composed of clinical and sociodemographic variables chosen a priori: sex, age, race, religious affiliation, individual income, type of mental illness, years of education, engagement in physical activity, and psychiatric comorbidity.

A 95% confidence interval was utilized as a measure of association for interpreting the results. Multicollinearity was assessed using the variance inflation factor, and values below 3 were considered to indicate low correlation with other predictors.

## RESULTS

In total, 208 patients were recruited for the study, of whom 5 declined to participate and 2 responded only partially to the questionnaires, resulting in a sample size of 201 patients. Initially, patients were divided into two groups: 83 with SCZ or schizoaffective



disorder and 118 with BD. The BD group had a higher proportion of women (n=90; 76.3%), individuals of white ethnicity (n=26; 22.2%), and a greater prevalence of family history of psychiatric illness (n=89; 76.1%) compared to the SCZ and schizoaffective disorder group. Other characteristics did not show significant differences between the groups (insert table 1). Regarding the variables associated with COV-SARS 2 and the scores on the anxiety, depression, and PTSD scales, there was also no statistical difference between the two groups of patients stratified by diagnostic categories (insert table 2).

So, given the similarity of the groups in terms of COV-SARS 2-related characteristics and symptom scale scores, some statistical analyses were conducted encompassing the total number of patients. These analyses revealed the prevalence of probable anxiety disorder (GAD  $\geq 10$ ), depressive disorder (PHQ-9  $\geq 10$ ), and PTSD (PCL-C  $\geq 50$ ) of 28%, 34%, and

17%, respectively (insert table 3). Analyzing the total patient sample (n=201), higher scores on the GAD-7 and PHQ-9 scales were associated with feeling exposed to stressful media news (OR=2.1; p=0.034; OR=2.36; p=0.027) and having any psychiatric comorbidity (OR=2.21; p=0.028; OR=2.88; p=0.008). Lower scores on the GAD-7 and PHQ-9 scales were associated with engaging in physical activity (OR=-2.34; p=0.04; OR=-2.72; p=0.027) (insert tables 4 and 5). There was no association between the analyzed variables and the PCL-C score (insert table 6).

## DISCUSSION

This study investigated the prevalence of anxiety and depressive symptoms, as well as PTSD in patients with BD, SCZ, and schizoaffective disorder during the COV-SARS 2 pandemic in a city in northeastern Brazil, and revealed rates at 28%, 34% and 17%, respectively. Similar results were found in a study conducted in Italy in April 2020 with 100 individuals with BD, indicating a prevalence of 26% for anxiety symptoms using the GAD-7 scale and 17% for PTSD, based on the Impact of Event Scale-Revised (IES-R)<sup>27</sup>. However, there was a difference in the prevalence of depressive symptoms, which was lower in the Italian study (17%) compared to our findings (34%). This divergence may be attributed to the scale used to measure depressive symptoms, as we used a self-assessment scale (PHQ-9), whereas forecited study employed a scale administered by professionals (Hamilton Depression Rating Scale). Furthermore, it is important to note that the data were collected at different times during the pandemic. In fact, this difference in timing suggests that our study, conducted later, may have captured a greater likelihood of depressive reactions, as by 2021, the pandemic was ongoing, with global reports of numerous deaths

and uncertainties about coronavirus control. In fact, the same authors conducted a longitudinal study with these subjects and identified increasing severity of psychiatric symptoms over time, associated with lower employment rates and subjects with a relative at risk for COV-SARS 2 medical complications<sup>28</sup>.

In this line of investigation, a study conducted in China, in February 2020, involving 76 individuals with previous mental disorders (depressive and anxiety disorders diagnosed according to the ICD-10, WHO 1992) and 109 controls, showed results like ours, regarding symptoms of anxiety and depression. The prevalence rates were 26.2% and 34.2% respectively, both assessed using the Depression Anxiety and Stress Scale (DASS-21)<sup>4</sup>. However, there was a disparity in the prevalence of PTSD, which was 31.6% as measured by the IES-R, maybe because China was the country where the pandemic was brock out and generated more traumatic experiences. Later, in consensus with our findings, other studies showed that the COV-SARS 2 pandemic has resulted in setbacks to the mental health of people with mental disease, promoting several kinds of psychiatric symptoms. In this regard, many studies aimed to investigate factors associated with the severity of psychiatric symptoms and psychological distress such as social isolation, due to the restrictive measures that were implemented, and loneliness<sup>29,30</sup>. In this line of investigation, our study also demonstrated that feeling exposed to stressful media news and having any psychiatric comorbidity were associated to high levels of anxiety and depressive symptoms.

On the other hand, engaging in physical activity, considered an important protect factor to mental health, was not sufficiently investigated in persons with SMI during the SARS-COV 2 pandemic<sup>19</sup>. However, among the general population, a Brazilian study conducted in May 2020, which evaluated 1871 participants without diagnosed mental illness, found that a reduction of physical activity was correlated with a decline in quality of life and an increase in self-reported anxiety and depression<sup>19</sup>. Additionally, similar results with general population were also found in a cohort study conducted in the United Kingdom with 3,281 adults aged over 50 years. Their results suggested that a decrease in physical activity was associated with more anxiety and depressive symptoms, now measured by GAD-7 and PHQ-9, respectively<sup>14</sup>.

In this sense, the present study revealed that physical activity was associated with lower scores on the GAD-7 and PHQ-9 scales, which suggests less anxiety and depressive symptoms. Aligned with our findings, one Iranian study, conducted in 2020, with patients hospitalized with COVID-19, with or without previous diagnoses of mental illness (without specifying the presence of individuals with SMI) also suggested that low levels of physical activity is linked to higher probability of anxiety<sup>31</sup>. Another one, conducted prior to the



SARS-COV 2 pandemic, involving 122 euthymic patients with BD revealed that sedentary behavior was associated with residual depressive symptoms<sup>17</sup>. Therefore, forecited evidence suggests that regular physical activity would be an important protect factor for mental illness and the severity of psychiatric symptoms.

These findings are of particular importance given the prevalence of sedentary behavior among people with SMI. In studies prior to the COVID-19 pandemic, reviews indicated that individuals with SMI exhibited greater sedentary behavior and reluctance to engage in physical activity, especially in people with SCZ, when compared to the general population.

In this context, it was suggested that factors such as the use of antidepressants and antipsychotics, limited resources, and low social support could serve as barriers to engaging in physical activity<sup>15,18</sup>. Additionally, when evaluating the role of physical activity in the management of mood disorders, studies have shown that regular exercise influenced parameters related to both mental and physical health<sup>16</sup>.

Although this study is important for evaluating parameters of mental illness and its relationship with clinical and sociodemographic data among patients with SMI during the first year of the pandemic in Brazil, some limitations need to be noted. Firstly, we relied on self-report measures, which, while facilitating data collection, may provide inaccurate responses due to individual subjectivity. Furthermore, the cross-sectional study design prevents the establishment of causal relationships between variables. Finally, despite efforts to obtain a representative sample of the population diagnosed with BD, SCZ, and schizoaffective disorder, it is important to acknowledge that the sample consisted of patients who were able to attend the outpatient clinic during the pandemic. This circumstance may have introduced a selection bias, potentially grouping individuals with less severe symptoms or those without significant disease decompensation at the time of evaluation. It is worth mentioning that none of the patients agreed to participate in interviews via the platform, possibly due to difficulties accessing technology, particularly among individuals with predominantly low socioeconomic status.

Despite its limitations, this study holds important implications for the prevention and intervention strategies using physical activity in individuals with SMI reducing mood and anxiety symptoms. Its strengths include assessing the prevalence of psychiatric symptoms in SMI patients using validated measurement tools, focusing on a vulnerable and stigmatized population that requires special attention, and exploring the potential association of psychiatric symptoms with a known protective and modifiable factor such as physical activity.

## CONCLUSION

Our results show that, unfortunately, individuals with SMI had their mental health compromised during the SARS-COV 2 pandemic and feeling exposed to stressful media news and having any psychiatric comorbidity were associated with high levels of anxiety and depressive symptoms. On the other hand, physical activity was considered a protective factor against the manifestation of symptoms. Health authorities should remain vigilant to individuals with mental disorders, as the repercussions of the stress process experienced during the almost 4 years of pandemic can lead to serious future mental health problems for this population.

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## TABLES

Table 1. Sociodemographic and clinical characteristics of patients with schizoaffective disorder/schizophrenia (N=83) and bipolar disorder (N=118).

	Schizoaffective disorder/SCZ n (%)	Bipolar disorder n (%)	n p-value <sup>1</sup>
Sex			<b>0.024</b>
Female	<b>51 (61.4)</b>	<b>90 (76.3)</b>	
Age *	51 (37, 57)	51 (40, 62)	0.200
Race			<b>0.028</b>
Black	20 (24.1)	30 (25.6)	
White	<b>8 (9.6)</b>	<b>26 (22.2)</b>	
Mixed	<b>53 (63.9)</b>	<b>61 (52.1)</b>	
Indigenous	2 (2.4)	0 (0.0)	
Religion**	75 (90.4)	99 (83.9)	0.200
Children**	39 (47.0)	69 (58.5)	0.110
Individual income**	59 (71.1)	88 (74.6)	0.600
Literacy**	81 (97.6)	112 (94.9)	0.500
Suicide attempt**	26 (31.3)	42 (35.6)	0.500
Psychiatric comorbidity**	22 (26.5)	41 (35.0)	0.200
Physical activity**	14 (16.9)	27 (22.9)	0.300
Family history of mental illness**	<b>51 (61.4)</b>	<b>89 (76.1)</b>	<b>0.026</b>

SCZ: schizophrenia

<sup>1</sup> Pearson's Chi-squared test; Wilcoxon rank sum test; Fisher's exact test

\* Median

\*\* Yes



Table 2. Variables associated with COVID-19 and scores on the anxiety, depression, and PTSD scales in patients with schizoaffective disorder/schizophrenia (N=83) and bipolar disorder (N118).

	Schizoaffective disorder /SCZ	Bipolar disorder n (%)	p-value <sup>1</sup>
n (%)			
COVID-19 variable (Yes)			
Positive test	12 (14.5)	14 (11.9)	0.600
Presence of symptoms	24 (28.9)	47 (39.8)	0.110
Infected individuals in the neighborhood	67 (80.7)	88 (74.6)	0.300
Area of higher risk	30 (36.1)	35 (29.7)	0.300
Someone infected at home	28 (33.7)	42 (35.6)	0.800
Someone not residing in the household infected	67 (80.7)	105 (89)	0.100
Someone who died from COVID-19	51 (61.4)	77 (65.3)	0.600
Feeling or having felt fear of COVID-19	51 (61.4)	65 (55.1)	0.400
Exposure to stressful media news	49 (59.0)	69 (58.5)	>0.900
Scales			
GAD-7			0.900
< 10	61 (73.5)	84 (71.2)	
≥ 10	22 (26.5)	34 (28.8)	
PHQ-9			0.500
< 10	155 (66.3)	78 (66.1)	
≥ 10	28 (33.7)	40 (33.9)	
PCLC			0.200
< 50	58 (69.9)	71 (61.2)	
≥ 50	25 (30.1)	45 (38.8)	

1 Pearson's Chi-squared test; Wilcoxon rank sum test; Fisher's exact test

PHQ-9: Patient Health Questionnaire-9; GAD-7: General Anxiety Disorder-7 scale; PCLC: The PTSD Checklist for civilians.

Table 3. Anxiety, depression, and PTSD symptoms in individuals with bipolar disorder, schizophrenia, and schizoaffective disorder (N =201).

Scores	N (%)
GAD-7	
Minimal (0-4)	95 (47)
Mild anxiety (5-9)	50 (25)
Moderate Anxiety (10-14)	20 (10)
Severe anxiety (≥ 15)	36 (18)
PHQ-9	
None-minimal (0-4)	81 (40)
Mild (5-9)	52 (26)
Moderate (10-14)	29 (14)
Mod Severe (15-19)	22 (11)
Severe (20-27)	17 (9)
PCLC	
Minimal-mild risc (0-50)	166 (83)
Moderate-high risc (≥ 50)	33 (17)
Unknown	1

PHQ-9: Patient Health Questionnaire-9; GAD-7: General Anxiety Disorder-7 scale; PCLC: The PTSD Checklist for Civilian.

Table 4. Clinical and sociodemographic characteristics associated with symptoms of anxiety in patients with schizophrenia, schizoaffective disorder, and bipolar disorder (N = 201).

GAD-7		Mean value (sd)	Beta (multivariable)		
Exposure to stressful media news	No	4.9 (6.2)	-		
	Yes	<b>8.1 (6.4)</b>	<b>2.10 (0.16 to 4.04, p=0.034)</b>		
Feeling or having felt fear of COVID-19	No	5.6 (6.4)			
	Yes	7.6 (6.5)	1.33	(-0.58 to 3.24, p=0.170)	
Age	[21.0,85.0]	6.8 (6.5)	-0.05	(-0.12 to 0.02, p=0.161)	
Sex	Female	6.9 (6.5)	-		
	Male	6.4 (6.6)	-1.05	(-3.05 to 0.95, p=0.300)	
Race	Black	6.3 (6.5)	-		
	White	5.7 (6.2)	0.11	(-2.75 to 2.98, p=0.938)	
	Mixed	7.3 (6.5)	1.38	(-0.76 to 3.52, p=0.206)	
	Indigenous	9.0 (11.3)	3.15	(-6.30 to 12.61, p=0.511)	
Religion	No	8.8 (5.8)	-		
	Yes	6.4 (6.5)	-1.19	(-3.89 to 1.50, p=0.384)	
Individual income	No	7.2 (6.5)	-		
	Yes	6.6 (6.5)	0.27	(-1.84 to 2.38, p=0.802)	
Years of education	[0.0,21.0]	6.8 (6.5)	0.00	(-0.22 to 0.22, p=1.000)	
Physical activity	No	7.2 (6.7)	-		
	Yes	<b>5.2 (5.4)</b>	<b>-2.34</b>	<b>(-4.57 to -0.11, p=0.040)</b>	
Clinical comorbidity	No	7.0 (6.9)	-		
	Yes	6.6 (6.3)	-0.40	(-2.38 to 1.59, p=0.694)	
Mental disorder	Schizophrenia	6.6 (5.9)	-		
	Bipolar disorder	7.0 (6.9)	0.73	(-1.22 to 2.69, p=0.460)	
	Schizoaffective disorder	4.6 (6.3)	-1.78	(-6.11 to 2.54, p=0.417)	
Psychiatric comorbidity	No	5.8 (6.1)	-		
	Yes	<b>8.9 (6.9)</b>	<b>2.21 (0.25 to 4.17, p=0.028)</b>		

GAD-7: General Anxiety Disorder-7 scale.

Table 5. Clinical and sociodemographic characteristics associated with depressive symptoms in patients with schizophrenia, schizoaffective disorder, and bipolar disorder (N=201).

Total PHQ-9		Mean	
		Value (sd)	Beta (multivariable)
Exposure to stressful media news	No	6.2 (6.0)	-
	Yes	9.1 (7.4)	2.36 (0.27 to 4.45, p=0.027)
Feeling or having felt fear of COVID	No	7.3 (6.9)	-
	Yes	8.4 (7.0)	0.50 (-1.56 to 2.55, p=0.635)
Age	[21.0;85.0]	7.9 (7.0)	-0.02 (-0.10 to 0.06, p=0.640)
Sex	Female	7.9 (7.0)	-
	Male	8.0 (7.1)	0.19 (-1.96 to 2.35, p=0.860)
Race	Black	7.7 (7.1)	-
	White	8.0 (6.9)	0.85 (-2.24 to 3.95, p=0.586)
	Mixed	8.0 (7.0)	0.53 (-1.78 to 2.83, p=0.652)
	Indigenous	9.0 (12.7)	-1.75 (-11.94 to 8.45, p=0.736)
Religion	No	10.6 (6.0)	-
	Yes	7.5 (7.1)	-2.49 (-5.39 to 0.42, p=0.093)
Individual income	No	7.7 (7.2)	-
	Yes	8.0 (6.9)	0.50 (-1.78 to 2.77, p=0.667)
Mental disorder	Schizophrenia	7.2 (6.3)	-
	Bipolar disorder	8.2 (7.3)	0.67 (-1.44 to 2.78, p=0.531)
	Schizoaffective disorder	9.8 (8.9)	2.92 (-1.74 to 7.59, p=0.217)
Years of education	[0.0;21.0]	7.9 (7.0)	0.00 (-0.24 to 0.24, p=0.989)
Physical activity	No	8.6 (7.2)	-
	Yes	5.5 (5.7)	-2.72 (-5.12 to -0.31, p=0.027)
Clinical comorbidity	No	7.2 (7.4)	-
	Yes	8.3 (6.8)	0.95 (-1.19 to 3.08, p=0.384)
Psychiatric comorbidity	No	6.8 (6.4)	-
	Yes	10.1 (7.6)	2.88 (0.76 to 4.99, p=0.008)

PHQ-9: Patient Health Questionnaire-9.

Table 6. Clinical and sociodemographic characteristics associated with symptoms of post-traumatic stress in patients with schizophrenia, schizoaffective disorder, and bipolar disorder (N=201).

Total PCLC		Mean	Beta (multivariable)	
		value (sd)		
Exposure to stressful media news	No	31.8 (14.8)	-	
	Yes	37.3 (15.6)	4.13	(-0.55 to 8.82, p=0.083)
Feeling or having felt fear of COVID	No	33.3 (14.3)	-	
	Yes	36.3 (16.2)	2.34	(-2.29 to 6.96, p=0.320)
Age	[21.0,85.0]	35.0 (15.5)	-0.15	(-0.33 to 0.02, p=0.083)
Sex	Female	35.6 (15.8)	-	
	Male	33.7 (14.9)	-2.06	(-6.88 to 2.76, p=0.400)
Race	Black	33.4 (15.6)	-	
	White	33.4 (14.4)	2.20	(-4.76 to 9.16, p=0.534)
	Mixed	36.3 (15.8)	3.81	(-1.39 to 9.02, p=0.150)
	Indigenous	34.0 (17.0)	-0.98	(-23.76 to 21.80, p=0.933)
Religion	No	41.2 (15.2)	-	
	Yes	34.1 (15.4)	-4.94	(-11.53 to 1.64, p=0.140)
Individual income	No	36.8 (17.1)	-	
	Yes	34.4 (14.8)	-0.82	(-5.93 to 4.29, p=0.751)
Mental disorder	Schizophrenia	33.1 (13.1)	-	
	Bipolar disorder	36.2 (16.8)	3.14	(-1.58 to 7.86, p=0.191)
	Schizoaffective disorder	35.5 (16.5)	2.99	(-7.44 to 13.41, p=0.572)
Years of education	[0.0,21.0]	35.0 (15.5)	-0.19	(-0.72 to 0.35, p=0.493)
Physical activity	No	36.0 (16.2)	-	
	Yes	31.3 (11.8)	-4.29	(-9.74 to 1.15, p=0.122)
Clinical comorbidity	No	33.6 (15.9)	-	
	Yes	35.7 (15.3)	2.01	(-2.77 to 6.80, p=0.408)
Psychiatric comorbidity	No	33.2 (14.9)	-	
	Yes	38.5 (15.9)	4.01	(-0.73 to 8.75, p=0.097)

PCLC: The PTSD Checklist for civilians.