Journal of Affective Disorders 281 (2021) 13–23

Contents lists available at ScienceDirect

Journal of Affective Disorders

journal homepage: www.elsevier.com/locate/jad

Research paper

Effects of the COVID-19 pandemic and lockdown in Spain: comparison between community controls and patients with a psychiatric disorder. Preliminary results from the BRIS-MHC STUDY.

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ARTICLE INFO

Keywords:
COVID-19
pandemics
mental health
bipolar disorder
depression
anxiety
psychotic disorders

ABSTRACT

Background: : The aim of this study was to evaluate potential differences about the effects of the COVID-19 pandemic and lockdown between community controls (CC) and patients with a mental illness (MI) in a Spanish population during the state of emergency.
Methods: : Individuals with a psychiatric condition and the general population were invited to complete an anonymous online survey. Bivariate analyses were used to compare them in a broad range of measures: sociodemographic, clinical variables, behavioral changes related to the lockdown and coping strategies to face it. Two groups of different psychiatric disorders were compared: depression or anxiety disorders (D+A) versus bipolar disorder and schizophrenia related disorders (BD+SCZ).
Results: : 413 CC and 206 MI were included in the study. CC reported to use more adaptive coping strategies as following a routine, talking to friends/relatives, practicing physical exercise and maintaining a balanced diet. MI reported significantly more anxiety and depression symptoms during the lockdown when compared to CC. Gaining weight, sleep changes, and tobacco consumption were more prevalent in the MI group. The D+A group showed significantly more psychological distress and negative expectations about the future, suffered more sleep disturbances when compared to BD+SCZ, whilst reported to practice more exercise.
Limitations: : psychiatric disorders were self-reported.
Conclusions: : Imposed restrictions and uncertainty during confinement had a higher psychological impact in individuals with a psychiatric illness, with less healthy behavior strategies to face the situation. Developing interventions to mitigate negative mental health outcomes among this vulnerable population will be essential in the coming months.

1.- Introduction

As a result of the Coronavirus Disease 2019 (COVID-19) pandemic, governments around the world have made efforts towards tackling the virus and limiting disease transmission, focused on social distancing and the shutdown of non-essential services. On 31 January 2020, Spain confirmed its first case of COVID-19. The Spanish government implemented a state of emergency from mid-March to late June,

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https://doi.org/10.1016/j.jad.2020.11.099
Received 23 September 2020; Received in revised form 7 November 2020; Accepted 11 November 2020
Available online 24 November 2020
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implementing at first strict lockdown measures all over the country which were then eased in stages in each region depending on the evolution of the infections in that area.

The COVID pandemic has been devastating not only due to its direct impact on people's lives, physical health, and socio-economic status, but also for its impact on mental health. However, most of the studies published during the current COVID-19 pandemic have focused on psychological distress in the general population and few have focused on individuals with a pre-existing psychiatric disorder. Several studies focusing on the current situation demonstrated that the pandemic and the lockdown increased anxiety and depression in the general population (Fullana et al., 2020)(Petzold et al., 2020)(Salari et al., 2020)(Wang et al., 2020)(Xiong et al., 2020). Different factors which may influence this increase in anxiety, stress and depression include: duration of lockdown and social distancing, lack of psychological or physical coping strategies, facing great changes, financial issues, changes in sleep and dietary patterns, and disruption of daily routines, amongst others (Salari et al., 2020). Individuals with a pre-existing psychiatric disorder are a vulnerable population: they have a higher risk of infection and of suffering complications of COVID-19 than those without a mental disorder, due to the illness per se, cognitive deficits and comorbid conditions (obesity, diabetes, hypertension) (Shinn and Viron, 2020)(Yao et al., 2020). Moreover, the confinement and lockdown might particularly affect them, resulting in relapses or worsening the illness course, since they may be more susceptible to stress (Kozloff et al., 2020). Evidence reveals that people with psychiatric disorders have more difficulties managing stressors and using adaptive coping strategies to face up stressful life conditions (Phillips et al., 2009).

The lockdown may have also led to reduced social or psychiatric support for many patients. Moreover, during the confinement in Spain, people were called on to not only to stay at home, but also to avoid non-urgent use of health resources, making this a critical time for the population with a psychiatric illness. Other risk factors likely to be implicated in pandemic-related mental health are fear of infection, unknown treatment, insufficient supplies, and financial losses. Thereby, mental health burden and an increase in use of mental health services are expected as a consequence of this pandemic (Vieta et al., 2020)

The early weeks of the pandemic saw rapid changes in daily routines, with school and university closures and a shift towards working remotely. These disruptions may put an already vulnerable group at even greater risk of suffering mental health challenges (Conrad et al., 2020). Furthermore, loneliness may be particularly prevalent and devastating during the pandemic, given directives for social distancing. The aim of the **B**arcelona **R**es**I**lience **S**urvey for **M**ental **H**ealth **C**OVID-19 (BRIS-MHC) study was to assess if the adopted lockdown measures were more aversive for individuals with a psychiatric disorder. The impact of COVID-19 pandemic crisis on individuals with mental illnesses was also evaluated. The BRIS-MHC project includes a broad range of measures that may influence mental health outcomes (as resilience, cognitive reserve, cognition, affective temperaments, perceived family environment and trauma experiences) and future longitudinal data will be collected. The study of this population will be useful to develop specific strategies for patient care in the Mental Health System. We hypothesized that psychological distress would be heightened in individuals with a psychiatric disorder, and that they would also use fewer coping strategies to better manage the confinement, as compared to the general population without a psychiatric condition.

2.- Methods

The BRIS-MHC study received ethics approval from the Hospital Clínic de Barcelona Ethics Committee (approval number: protocol HCB/2020/0530) and complied with the Declaration of Helsinki.

2.1.- Design

This project consists of an online survey at baseline followed by a survey at six-months to allow for future longitudinal data collection. The cross-sectional findings from the first wave of the project are reported here. Spanish citizens aged ≥18 years residing in Spain were invited to complete the survey over a time period extending from 14th May to 8th June 2020. This coincided with a state of alarm due to the pandemic in Spain, with different levels of restrictions depending on the area of Spain (stage 1 or 2), whereby Spanish residents were expected to self-isolate and were only allowed to leave their homes for essential activities such as employment, medical care or to buy groceries.

Both patients suffering from a psychiatric disorder and the general population were invited to complete the survey. Most of the psychiatric patients who participated in the study belong to the Bipolar and Depressive Unit of the Hospital Clinic with the diagnoses verified by a medical professional. For the rest of the participants, the diagnosis was self-reported as interviews were not feasible at this time frame.

The survey was conducted using the online anonymous survey system of Hospital Clinic of Barcelona through a multiple step procedure: a) e-mail invitation to patients visited at the Mental Healthcare of the Hospital Clinic of Barcelona, b) dissemination of the link through social media and other advertisements c) involvement of national associations of stakeholders (e.g., associations of users/caregiver). The survey included one question asking them whether they had a psychiatric disorder, and if so, which psychiatric disorder they had. Patients with different long-lasting psychiatric disorders, such as depression and/or anxiety disorders or with a bipolar disorder or schizophrenia related disorders, were included in the survey as well as patients presenting a first episode of psychosis or mania in the last 5 years.

The snowball sampling procedure gave us the opportunity to recruit a larger sample of the Spanish population and to evaluate the effect of the studied variables on the outcome measures. Participants could interact with the principal investigator of the study through email messages at any time during and after study participation.

2.2.- Participants

In total, 898 participants took part in the survey. After removing the participants who did not complete at least the 70% of the survey, 619 participants were involved in the current study. A written consent in the first section of the online survey was given to all participants before filling the questionnaire.

Participants have been subdivided into two groups: a) community controls, and b) subjects with a psychiatric disorder.

We compared the respondents to the online survey who had a pre-existing psychiatric disorder with those with reported no mental condition, in terms of: sociodemographic variables, personal, emotional and behavioral changes related to the lockdown and coping strategies, concerns about COVID-19, and several questions related to clinical issues. Secondly, we compared patients with different psychiatric disorders: we grouped together patients with depression and/or anxiety disorders, and, in another group, patients with bipolar disorder or schizophrenia related disorders.

2.3.- Measures

Our survey BRIS-MHC included a broad range of measures aimed at assessing the mental health impact of the COVID-19 pandemic on the Spanish population. The survey was composed of a range of quantitative and qualitative questions regarding the effects of the lockdown, as a measure to assess the effects of the pandemic in the psychopathological status of both subjects with a psychiatric illness and controls.

The entire survey took approximately 15-20 minutes to complete and covered 9 broad topics: a) Depression and anxiety, b) Trauma experiences, c) Psychotic-like experiences, d) Resilience (state and trait), e)

Affective temperament, f) Perceived family environment, g) Cognition, h) Cognitive reserve, and i) Physical aggressiveness.

a) Psychological distress was measured by several 4-item scales (scores from zero to three) to assess the frequency of different emotions and behaviors that may appear related to anxiety and depression, inspired by the Generalized Anxiety Disorder -GAD-7- (Spitzer et al., 2006) and the Patient Health Questionnaire -PHQ-9- (Kroenke et al., 2001). The GAD-7 represents an anxiety measure based on seven items and the PHQ-9 is the depression module, which scores each of the 9 DSM-IV criteria as '0' (not at all) to '3' (nearly every day).

   Trauma experiences. Participants who responded that they had experienced an unpleasant event during the lockdown were asked further about post-traumatic stress symptoms, by means of several questions inspired by the Posttraumatic Stress Disorder Symptom Severity Scale-Revised (EGS-R) (Echeburúa et al., 2016). Respondents reported the frequency of 8 kinds of symptoms related to two principal domains (re-experience and dissociative symptoms) on a 4-item scale. When the respondents answered 0-1 to the questions, we considered the absence of the particular symptom. On the contrary, when they answered 2 or 3, the presence of the symptom was considered. The original scale is a 21-item structured interview based on DSM-5 criteria and intended to assess the severity of the symptoms of post-traumatic stress disorder.

b) Psychotic-like experiences were assessed by means of a 4-point scale adapted from the Community Assessment Psychic Experiences -42 (CAPE-42) (Fonseca-Pedrero et al., 2012) to assess positive and negative dimensions. The original scale has been used extensively as a measurement for psychosis proneness in clinical and research settings. Positive and negative dimensions were evaluated on the basis of 9 items derived from the CAPE-42 (6 positive items: conspiracy, being important, messages from tv, thought withdrawal, double meaning and verbal hallucinations; and 3 negative items: lack of enthusiasm, no interest in others, and lack of hygiene). Respondents reported the frequency of each psychotic-like experience from 'never' to 'nearly always' and then scores were added up.

c) Resilience (state and trait): State resilience was evaluated on the basis of 6 yes/no items derived from the Brief Resilience Scale (BRS) (Smith et al., 2008). The BRS evaluates the ability to bounce back or recover from stress. There are 6 items, half of which are negatively focused and half positively focused. Inverted items were turned into positive answered. If the participants scored yes on 0 to 2 items they were considered to have "bad state resilience". If they scored yes on 4 to 6 items, "good state resilience" was assumed. If the participants scored yes on 3 items, they were considered to have "neutral state resilience". Trait resilience was evaluated on the basis of 14 yes/no items derived from the Resilience Scale (RS-14) (Wagnild, 2009). The RS-14 was developed as a general measure of resilience for adults across the lifespan, including personal perseverance and acceptance of self and life. If the participants scored no on ≥ 9 items or yes on ≤ 5 items, they were considered to have "bad trait resilience". If the participants scored yes on ≥ 9 items or no on ≤ 5 items, they were considered to have "good trait resilience". In the case they scores yes or no on 6 to 8 items, "neutral trait resilience" was assumed.

d) Affective temperament was measured through 20 items with a yes/no response, inspired by the TEMPS-A Scale (Akiskal and Akiskal, 2005)(Jiménez et al., 2019) which is a self-report questionnaire designed to measure temperamental variations in psychiatric patients and healthy volunteers. Its constituent subscales and items were formulated on the basis of the diagnostic criteria for affective temperaments (cyclothymic, dysthymic, irritable, hyperthymic, and anxious). The survey included 4 items for each affective temperament. If the participants scored 3 or 4 points in each temperament, this specific temperament was assumed. Additionally, the co-occurrence of two affective temperaments (i.e. depressive-anxious, cyclothymic-anxious, etc.) was also considered.

e) Perceived family environment was measured with 10 yes/no questions inspired by 10 subscales of The Family Environment Scale (FES) (Moos and Moos, 1986), which was developed to measure perceived social and environmental family characteristics. The original scale is a 90-item inventory that has 10 subscales measuring the Interpersonal Relationship dimension, Personal Growth, and System Maintenance. FES evaluates family emotional climate in different categories: Cohesion (C) for mutual reliance; Expressivity (EX), the extent to which family members express their feelings directly; Conflicts (CON) for open expression of anger, aggressiveness and conflict; Independence (IND), the extent to which family members are independent in their decisions; Achievement Orientation (AO) for an achievement orientated environment; Intellectual–Cultural Orientation (ICO) for political, intellectual, cultural interests; Active –Recreational Orientation (ARO) for participation in social activities; Moral–Religious Emphasis (MRE) for the importance given to ethical and religious practices and values; Organization (ORG) for the organization in activities and responsibilities; and Control (CTL), the extent to which the family considers rules and established procedures.

f) Cognition was measured through self-reported questions tackling the main cognitive domains. We tried to design "ecological" items that represent cognitive deficits with impact in daily functioning. Five cognitive functions were considered: attention, immediate memory, learning, executive function (planning) and processing speed, with one item corresponding to each domain. The items were created following the "theoretical" definition of each domain. We asked if during the confinement the person had experienced any of these cognitive deficits. A Likert scale of four options (from any day (0) to almost every day (3)) was used for its quantification. The criteria established to consider the presence of moderate and severe cognitive impairment in each domain was to score at least 2 points. We also created a dichotomous variable of Cognitive Impairment following the same criteria: an answer of yes with score of 2 or more in at least one cognitive domain was considered as a moderate-severe cognitive impairment; below that score was intact and mild cognitive impairment.

g) Cognitive reserve was measured based on two proxies of this concept (education and leisure activities) relying on the Cognitive Reserve Assessment Scale in Health (CRASH) (Amoretti et al., 2019) 'Education' was assessed taking into account the maximum educational level (Primary education; Compulsory secondary education; Pre-University Baccalaureate; Intermediate or higher vocational education degree; University studies; Post-graduate studies: masters or postgraduate; Post-graduate studies: doctorate). Only completed studies are counted. The second proxy, 'Leisure activities' was assessed by asking about hobbies. A Principal Components Analysis (PCA) was performed to create a "Cognitive reserve score" for each subject with the two main proxies. Higher scores correspond to better performance.

h) Physical Aggressiveness was evaluated on the basis of 7 yes/no items derived from the Aggression Questionnaire (AQ) (Buss and Perry, 1992). The presence of physical aggressiveness was assumed in the case that the participants scored yes on at least 4 of the 7 questions.

The sociodemographic data collected were: age, gender, educational level, urbanicity, type of housing, number of people they lived with, care of minor or dependents, and current work status. Another pool of data collected regarded concerns related to COVID-19: risk of exposure at work, perceived risk of pandemic-related job loss, reduction of economic income during the pandemic, infection or death in relatives or friends, personal symptoms and diagnosis of COVID-19, and future expectations after the pandemic.

Participants were also asked to rate the frequency of several

behavioral strategies to manage distress, or in other words coping strategies, during the lockdown: following a routine, talking to relatives/friends, maintaining a healthy or balanced diet, drinking water to hydrate, keeping updated about COVID-19 through exposure to the media, use of entertainment resources, practicing physical exercise, and taking part in relaxing activities.

The survey also included several items to assess changes during the confinement in terms of sleep disturbance, eating habits and weight, sexual activity, and substance use (alcohol, tobacco and cannabis). Participants were also asked about any recent exposure to significant life-events not related to COVID-19, unpleasant events during confinement, domestic violence, living far from the family, or recent house moves.

Patients visiting the Mental Healthcare of the Hospital Clinic of Barcelona and invited to complete the survey were also asked about the duration of their psychiatric condition, the need for any urgent visit at the community mental health service during the confinement, or if they decided to stop taking psychiatric medication during the study period.

Furthermore, the participants were asked about their family history of psychiatric disorders, and if they lived together with someone suffering from any psychiatric condition. Lastly, all participants were asked about needed to access emergency psychiatric services, psychiatric admission, and suicide attempts.

The purpose of the current paper is to describe the rationale and design adopted for this BRIS-MHC study, providing an overview of the selected sociodemographic and clinical variables, coping strategies to manage distress and concerns related to COVID-19 variables. Other measures related to resilience, cognition, cognitive reserve, family environment and traumatic experiences they will reported in further manuscripts.

2.3.- Statistical analyses

All analyses were carried out using the Statistical Package for the Social Sciences (SPSS) v23.0 (IBM, Armonk, NY, USA). A descriptive analysis was performed by calculating means and frequencies of variables. Subsequently, bivariate analyses were conducted with Chi-squared test (or Fisher's exact test), and Student's T-test when appropriate, to ascertain the presence of group differences between community controls and individuals with a psychiatric diagnosis. Then, the same analyses were run to assess potential differences between two groups of psychiatric diagnoses: those with depression and/or anxiety disorder and those with bipolar disorder or schizophrenia related disorders. For this last analysis, those patients that answered the question with "other psychiatric disorders" were discarded since they were only 7 patients with different type of diagnoses (i.e. borderline personality disorder, obsessive compulsive disorder, etc.). For significantly associated categorical variables, we measured the strength of this association by Phi and Cramer's V. Effect sizes were also calculated for continuous variables as Cohen's *d* value.

Significance was set at $p<0.05$ (two tailed) for all analyses.

3.- Results

The sample was composed of 433 (70%) women and 171 (27.6%) men (15 (2.4%) did not report the gender), with a mean age 45.41 (SD=13.77) (range 18-81). Spanish citizens from 15 provinces in Spain responded to the survey, although 83.7 % (n=518) of the sample came from Catalonia. Almost 85% of the responders lived in a town or city with more than 10.000 habitants, and more than half of the sample had completed university studies or higher (69.3%). Four hundred and thirteen respondents of the sample were considered community controls (CC) since they reported not having a psychiatric diagnosis and 206 of the sample were patients with a range of psychiatric diagnoses (depression, anxiety, bipolar disorders, schizophrenia and related disorders). The survey included data from 17 (2.7%) individuals with confirmed COVID-19 and 69 (11.14%) suspected cases without diagnosis and with mild symptoms.

3.1.- Community controls versus participants with a pre-existing psychiatric illness

Table 1 shows the main characteristics of the sample (complete data available under request). Concerning demographic characteristics, there were significant differences in gender and educational level between participants with a pre-existing mental illness (MI) and those without a psychiatric condition CC, with a higher proportion of women and higher educational level in the latter group. Differences were also detected in the type of housing; however, the strength of this association were minimal (Cramer's V= 0.11), although both groups did not differ in the proportion of urban or rural residences. Both groups also differed concerning care of minors under 12 years of age (CC=76.5% vs. MI=42.9%) and the work status: there were more participants working at home or at the workplace in the group of CC and more people unemployed in the patients group at the start of the pandemic. A higher proportion of healthcare service workers were within the group of CC. In relation to concerns about COVID-19, both groups only differed on the perceived risk of exposure at work, although the strength of the association was also minimal (Cramer's V= 0.19). Both groups had similar expectations about the future after the pandemic, with most of them thinking that it will take time to normalize.

With regard to affective temperaments, statistically significant differences in rates of all temperaments between groups were detected. Increased percentages of affective temperament were found in the group of patients in the depressive (MI=29.5% vs CC=8.1%), cyclothymic (MI=38.1% vs CC=13.1%), irritable (MI=28.2% vs CC=12.5%) and anxious (MI=30.0% vs CC=17.7%) temperaments. In contrast, the hyperthymic temperament was more prevalent in the non-clinical group (CC=49.3% vs MI=28.4%). Besides, higher rates of co-occurrence of two affective temperaments among patients were also detected, as the cyclothymic-anxious (MI=18.0% vs CC=6.7%) and depressive-anxious (MI=16.1% vs CC=4.1%).

As expected, patients reported significantly more symptoms related to anxiety ($p=0.001$; $d'= 0.31$) and depression ($p<0.001$; $d'= 0.59$) when compared to CC during the lockdown. Significant differences also emerged between both groups concerning the presence of psychotic-like experiences (either positive or negative dimensions), with higher scores in MI group (positive: $p<0.001$; $d'=0.38$, negative: $p<0.001$; $d'=0.42$). Concerning changes in behaviors to cope with lockdown, there were also statistically significant differences in some strategies, with higher percentages of CC having more coping strategies than patients: following a routine (CC=86.7% vs MI=69.8%), talking to friends or relatives (CC=99.5% vs MI=97.5%), practicing physical exercise (CC=83.3% vs MI=70.1%) and maintaining a healthy or balanced diet (CC=86.8% vs MI=80.1%). The group of patients also reported significantly more changes in gaining weight (MI=52.3% vs CC=32.6%) (but not changes in eating habits), sleep routine (going to bed earlier (MI=7.3% vs CC=1.9%) or later than usual (MI=30.1% vs CC=20.3%) and sleep disturbance (MI=60.7% vs CC=51.1%). There were no differences between both groups concerning the sexual activity. Regarding substance use, patients reported an increased use of tobacco (MI=19.9% vs CC=12.3%), but no significant differences were detected for the other two substances assessed (alcohol and cannabis). Both groups did not differ concerning physical aggressiveness tendency or suffering domestic violence of any kind during the confinement. A higher percentage of respondents in the group of pre-existing psychiatric illness referred to having experienced any unpleasant event during lockdown (MI=27.1% vs CC=17.2%), with more symptoms of re-experience ($p=0.001$; $d'=0.63$).

Of note, there were no significant differences between individuals with or without psychiatric diagnosis concerning the need to access to emergency psychiatric services during the lockdown.

Table 1
Characteristics of community controls and respondents with a psychiatric illness

	Community controls (n=413)	Individuals with psychiatric illness (n=206)			
	N(%) or Mean(SD)	N(%) or Mean(SD)	X^2 or t	p value	effect size
Sociodemographic variables					
mean age	44.89 (14.04)	46.44 (13.18)	-1.299	0.194	
gender (women)	306 (75.7)	127 (63.5)	9.879	0.002	0.12
educational level			38.627	<0.001	0.25
elementary school	8 (1.8)	5 (2.4)			
secondary school	11 (2.7)	5 (2.4)			
upper to secondary	68 (16.5)	78 (37.9)			
university or higher	312 (75.5)	117 (56.8)			
type of housing			08.541	0.036	0.11
flat or apartment with balcony/terrace	261 (64.0)	151 (74.4)			
flat or apartment without balcony/terrace	45 (11.0)	21 (10.3)			
house with garden/yard	91 (22.3)	29 (14.3)			
house without garden/yard	11 (2.7)	2 (1.0)			
minor or depend people in charge (yes)	136 (33.5)	56 (27.2)	2.530	0.112	
children under 12 years in charge	104 (76.5)	24 (42.9)	20.168	<0.001	0.32
current work status			87.677	<0.001	0.38
employed, doing work at the workplace	118 (29.3)	22 (10.9)			
employed, doing work at home/student	154 (38.2)	44 (21.8)			
employed or self-employed, but at home without working	27 (6.7)	11 (5.4)			
unemployed due to the pandemic	11 (2.7)	5 (2.5)			
temporary employment force adjustment	19 (4.7)	11 (5.4)			
unemployed before the pandemic	28 (6.9)	40 (19.8)			
retired, disability, sick leave	46 (11.4)	69 (34.2)			
healthcare workers			27.965	<0.001	0.21
yes, assistance service	70 (17.4)	11 (5.4)			
yes, but not assistance service	29 (7.2)	3 (1.5)			
Exposure to COVID-19					
risk of exposure at work (yes)	191 (50.0)	57 (29.4)	22.309	<0.001	0.19
COVID-19 symptoms			2.763	0.430	
positive. Moderate/severe	4 (1.0)	0 (0.0)			
positive. Mild	10 (2.5)	3 (1.5)			
mild symptoms, without test	46 (11.6)	23 (11.4)			
Expectations about the future			1.600	0.449	
will be normalized in a short time	41 (10.0)	27 (13.3)			
will take time to normalize	308 (75.5)	150 (73.9)			
will be sunk for a long time	59 (14.5)	26 (12.8)			
Psychological distress					
symptoms related to anxiety	3.64 (2.56)	4.51 (3.00)	-3.397	0.001	0.31
symptoms related to depression	4.49 (3.51)	7.15 (5.32)	-6.314	<0.001	0.59
Coping strategies (yes)					
follow a routine	351 (86.7)	141 (69.8)	24.963	<0.001	0.23
talk to relatives/friends	408 (99.5)	199 (97.5)	4.658	0.044	0.08
physical exercise	338 (83.3)	141 (70.1)	13.869	<0.001	0.15
healthy/balanced diet	348 (86.8)	161 (80.1)	4.579	0.032	0.08
drink water to hydrate	354 (87.2)	184 (90.6)	1.562	0.211	
being updated about COVID-19 with media exposure	258 (63.7)	129 (63.5)	0.001	0.970	
pursue hobbies or conduct home tasks	324 (80.0)	161 (79.3)	0.040	0.842	
do relaxing activities	312 (77.8)	158 (78.6)	0.50	0.823	
Lifestyle habits					
changes in eating habits	94 (23.0)	61 (29.9)	3.449	0.063	
weight gain	146 (36.2)	104 (52.3)	14.103	<0.001	0.15
weight loss	86 (21.6)	38 (20.1)	0.174	0.677	
sleep changes			11.166	0.004	0.13
sleep disturbances (fall asleep, wake up in the middle, earlier or tired)	211 (51.1)	125 (60.7)			
no difficulties to sleep (better, get up rested, relaxed)	76 (18.4)	44 (24.4)			
no changes	126 (30.5)	37 (18.0)			
sleep routine changes					
go to bed later than usual	84 (20.3)	62 (30.1)	7.261	0.007	0.10
go to bed earlier than usual	8 (1.9)	15 (7.3)	10.974	0.001	0.13
sexual activity changes (no)	231 (55.9)	107 (51.9)	0.883	0.347	
drugs consumption changes					
more alcohol	61 (14.8)	28 (13.6)	0.155	0.694	
more tobacco	51 (12.3)	41 (19.9)	6.199	0.013	0.10
more cannabis	8 (1.9)	4 (1.9)	0.000	1.000	
no changes	250 (60.5)	122 (59.2)	0.098	0.754	
Domestic violence	5 (1.3)	2 (1.0)	0.076	1.000	
Significant life events no related with COVID-19			4.289	0.117	
yes, positive	26 (29.2)	8 (14.3)			
yes, negative	28 (31.5)	22 (39.3)			
yes, both	35 (39.3)	26 (46.4)			

(*continued on next page*)

Table 1 (*continued*)

	Community controls (n=413)	Individuals with psychiatric illness (n=206)			
Unpleasant events during lockdown	70 (17.2)	55 (27.1)	8.139	0.004	0.11
re-experience symptoms	1.94 (2.47)	3.64 (2.85)	-3.555	0.001	0.63
dissociative symptoms (yes)	4 (5.8)	7 (12.7)	1.818	0.178	
Psychotic-like experiences					
positive dimension	0.98 (1.35)	1.62 (1.92)	-4.220	<0.001	0.38
negative dimension	0.95 (1.19)	1.59 (1.76)	-4.685	<0.001	0.42
Affective temperament					
depressive	32 (8.1)	59 (29.5)	46.930	<0.001	0.28
anxious	71 (17.7)	61 (30.0)	12.134	<0.001	0.14
cyclothymic	52 (13.1)	77 (38.1)	49.599	<0.001	0.28
irritable	50 (12.5)	57 (28.2)	22.688	<0.001	0.19
hyperthymic	188 (49.3)	56 (28.4)	23.292	<0.001	0.20
cyclothymic-anxious	26 (6.7)	36 (18.0)	18.057	<0.001	0.17
depressive-anxious	16 (4.1)	32 (16.1)	25.045	<0.001	0.20
Psychiatric variables					
psychiatric diagnosis					
anxiety disorder	–	30 (14.5)			
depressive disorder	–	20 (9.7)			
bipolar disorder	–	114 (55.3)			
schizophrenia	–	9 (4.3)			
schizoaffective disorder	–	15 (7.2)			
psychotic disorders	–	10 (4.8)			
other psychiatric illnesses	–	8 (3.8)			
other clinical variables (during lockdown)					
relative with a psychiatric diagnosis	92 (22.2)	98 (48.3)	41.119	<0.001	0.26
living with someone with a psychiatric diagnosis	29 (7.0)	32 (15.5)	11.211	<0.001	0.13
visit to psychiatric emergency rooms	8 (2.0)	4 (2.0)	0.001	1.000	
thinking about needed a first visit with psychiatrist or psychologist	34 (8.9)	–			
psychiatric admission	3 (0.7)	3 (1.5)	0.730	0.409	
suicide attempt	2 (0.5)	3 (1.5)	1.566	0.341	

3.2.- Differences between groups of participants with a pre-existing mental illness

A further analysis, after stratifying patients into two groups according to their diagnosis (Depression and Anxiety (D+A) vs. Bipolar disorder and Schizophrenia related disorders (BD+SCZ)), was also performed (see table 2). Respondents in the BD+SCZ group were older than D+A group (mean age= 48.8, SD=12.3 vs mean age= 40.6, SD=13.4, respectively). Both groups also differed concerning the type of housing, number of people at home, and work status. There were also a higher proportion of health workers in the group of D+A participants.

Statistically significant differences emerged regarding anxiety ($p<0.001$, $d'=0.67$) and depressive symptomatology ($p<0.001$, $d'=0.71$) between both groups, with patients in the D+A group reporting significantly more symptoms, as indicated by higher scores. The D+A group also had higher scores in psychotic-like experiences than the BD+SCZ (positive dimension: $p=0.002$; $d'=0.55$, negative dimension: $p<0.001$; $d'=0.63$). In contrast, no significant differences were found regarding other direct clinical variables: need of a psychiatric emergency visit, psychiatric admissions, or suicide attempts. When affective temperaments were analyzed, higher rates of distinct temperaments were detected in the D+A, such as the depressive (D+A=49.0% vs BD+SCZ=23.8%), the anxious (D+A=62.0% vs BD+SCZ=20.7%), the irritable (D+A=52% vs BD+SCZ=18.8%) and the co-occurring cyclothymic-anxious (D+A=36% vs BD+SCZ=12.7%) and depressive-anxious (D+A=34.7% vs BD+SCZ=10.6%). No differences were observed concerning the remaining temperaments between both groups of patients.

Concerning the use of coping or healthy behavior strategies for the lockdown, both groups did not differ in any strategy with the exception of physical exercise, where a higher proportion of the D+A group reported practicing physical exercise (D+A=82% vs BD+SCZ=66.4%). No differences were detected in terms of changes in eating habits or weight, or sexual activity. In contrast, concerning sleep, patients with D+A reported more changes in their routines (going to bed later D+A=50% vs BD+SCZ=23%), and sleep quality compared to those with a BD+SCZ (D+A=76% vs BD+SCZ=55.4%), who reported less changes in sleep (BD+SCZ=23% vs D+A=4%). A higher proportion of patients with a BD+SCZ reported no changes in their substance use, whereas an increase in cannabis consumption was statistically significant in the D+A group, with a higher percentage of patients reporting the increased intake (D+A=6% vs BD+SCZ=0%).

No significant differences emerged in relation to domestic violence during the lockdown. The D+A group reported having significant life events not related to COVID-19 (both, negative or positive), and suffering more unpleasant events during lockdown, than the BD+SCZ group (D+A=38.0% vs BD+SCZ=21.4%). Respondents in the D+A group had more negative expectations about the future than the BD+SCZ group, especially in thinking that things would take a long time to recover (D+A=22.9% vs BD+SCZ=10.2%).

4.- Discussion

In the present paper data from the first results of the BRIS-MHC project are described. Patients, particularly those with anxiety or depressive disorders, presented higher psychological distress (symptoms of anxiety and depression) than the general population during the lockdown in Spain. Restrictions that were imposed in order to decrease the transmission of the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2), together with the media reporting the escalating numbers of new cases and deaths, increased the intensity of anxiety, depression, feelings of loneliness and level of perceived threat in society. The recommendations and the necessary social distancing can have far-reaching negative consequences and might be associated with limiting the continuation of providing tailored care, support and treatment. Some populations, such as psychiatric patients, might be particularly vulnerable to such restrictions (Kontoangelos et al., 2020).

Secondly, all patients had more difficulties than the general

Table 2
Differences between groups of patients

	Anxiety and depressive disorders (n=50)	Bipolar disorder and Schizophrenia related disorders (n=148)			
	N(%) or Mean(SD)	N(%) or Mean(SD)	X^2 or t	p value	effect size
Sociodemographic variables					
mean age	40.69 (13.44)	48.82 (12.36)	-3.854	<0.001	0.63
gender (women)	36 (73.5)	87 (60.8)	2.529	0.112	
education			3.201	0.362	
elementary	1 (2.0)	4 (2.7)			
secondary	0 (0.0)	5 (3.4)			
upper to secondary	16 (32.0)	58 (39.5)			
university or higher	33 (66.0)	80 (54.4)			
type of housing			12.715	0.005	0.25
flat or apartment with balcony/terrace	36 (72.0)	109 (75.2)			
flat or apartment without balcony/terrace	1 (2.0)	20 (13.8)			
house with garden/yard	13 (26.0)	14 (9.7)			
house without garden/yard	0 (0.0)	2 (1.4)			
minor or depend people in charge (yes)	18 (36.0)	35 (23.6)	2.909	0.088	
children under 12 years in charge	10 (55.6)	13 (37.1)	1.641	0.200	
current work status			13.398	0.037	0.26
employed, doing work at the workplace	7 (14.0)	15 (10.4)			
employed, doing work at home/student	15 (30.0)	27 (18.8)			
employed or self-employed, but at home without working	3 (6.0)	8 (5.6)			
unemployed due to the pandemic	3 (6.0)	2 (1.4)			
temporary employment force adjustment	2 (4.0)	8 (5.6)			
unemployed before the pandemic	12 (24.0)	25 (17.4)			
retired,disability,sick leave	8 (16.0)	59 (41.0)			
healthcare workers			6.148	0.046	0.17
yes, assistance service	5 (10.0)	5 (3.4)			
yes, but not assistance service	2 (4.0)	1 (0.7)			
Exposure to COVID-19					
risk of exposure at work (yes)	21 (43.8)	35 (25.4)	5.722	0.017	0.17
COVID-19 symptoms			3.439	0.179	
positive. Moderate/severe	0 (0.0)	0 (0.0)			
positive. Mild	2 (4.0)	1 (0.7)			
mild symptoms, without test	7 (14.0)	14 (9.8)			
Expectations about the future			8.695	0.013	0.21
will be normalized in a short time	2 (4.2)	25 (17.0)			
will take time to normalize	35 (72.9)	107 (72.8)			
will be sunk for a long time	11 (22.9)	15 (10.2)			
Psychological distress					
symptoms related to anxiety	5.98 (3.14)	3.98 (2.82)	4.024	<0.001	0.67
symptoms related to depression	9.79 (5.47)	6.06 (4.93)	4.387	<0.001	0.71
Coping strategies (yes)					
follow a routine	33 (68.8)	101 (69.2)	0.003	0.956	
talk to relatives/friends	48 (98.0)	143 (97.3)	0.068	1.000	
physical exercise	41 (82.0)	95 (66.4)	4.313	0.038	0.15
healthy/balanced diet	41 (82.0)	114 (79.2)	0.470	0.493	
drink water to hydrate	44 (91.7)	134 (91.2)	0.012	1.000	
being updated about COVID-19 with media exposure	33 (67.3)	91 (62.3)	0.399	0.528	
pursue hobbies or conduct home tasks	44 (88.0)	110 (75.9)	3.299	0.069	
do relaxing activities	39 (79.6)	112 (77.8)	0.071	0.790	
Lifestyle habits					
changes in eating habits	12 (24.0)	46 (31.5)	1.007	0.316	
weight gain	23 (46.9)	79 (55.2)	1.011	0.315	
weight loss	10 (20.0)	24 (18.2)	0.079	0.779	
sleep changes			10.061	0.007	0.22
sleep disturbances (fall asleep, wake up in the middle, earlier or tired)	38 (76.0)	82 (55.4)			
no difficulties to sleep (better, get up rested, relaxed)	10 (20.0)	32 (21.6)			
no changes	2 (4.0)	34 (23.0)			
sleep routine changes	8 (16.0)	22 (14.9)	0.037	0.847	
go to bed later than usual	25 (50.0)	34 (23.0)	13.050	<0.001	0.25
go to bed earlier than usual	2 (4.0)	13 (8.8)	1.222	0.364	
sexual activity changes (no)	25 (50)	79 (53.4)	0.171	0.679	
drugs consumption changes					
more alcohol	10 (20.0)	15 (10.1)	3.297	0.069	
more tobacco	10 (20.0)	29 (19.6)	0.004	0.950	
more cannabis	3 (6.0)	0 (0.0)	9.017	0.015	0.21
no changes	26 (46.0)	96 (64.9)	5.547	0.019	0.16
Domestic violence	0 (0.0)	2 (1.4)	0.707	1.000	
Significant life events no related with COVID-19			9.660	0.022	0.220

(*continued on next page*)

Table 2 (*continued*)

	Anxiety and depressive disorders (n=50)	Bipolar disorder and Schizophrenia related disorders (n=148)			
yes, positive	2 (4.1)	5 (3.5)			
yes, negative	8 (16.3)	12 (8.5)			
yes, both	11 (22.4)	13 (9.2)			
Unpleasant events during lockdown	19 (38.0)	31 (21.4)	5.387	0.020	0.16
re-experience symptoms	3.79 (2.57)	3.61 (2.89)	0.218	0.828	
dissocative symptoms (yes)	1 (5.3)	5 (16.1)	1.317	0.249	
Psychotic-like experiences					
positive dimension	2.38 (2.27)	1.27 (1.65)	3.152	0.002	0.55
negative dimension	2.40 (1.91)	1.29 (1.59)	4.006	<0.001	0.63
Affective temperaments					
depressive	24 (48.0)	34 (23.8)	10.996	0.001	0.23
anxious	31 (62.0)	30 (20.7)	29.516	<0.001	0.38
cyclothymic	24 (48.0)	50 (34.7)	2.773	0.096	
irritable	26 (52.0)	27 (18.8)	20.664	<0.001	0.32
hyperthymic	14 (28.6)	39 (27.9)	0.009	0.924	
cyclothymic-anxious	18 (36.0)	18 (12.7)	13.205	<0.001	0.26
depressive-anxious	17 (34.7)	15 (10.6)	15.209	<0.001	0.28
Other clinical variables (during lockdown)					
visit to psychiatric emergency rooms	2 (4.1)	2 (1.4)	1.361	0.261	
unscheduled psychiatric visit	*	23 (16.4)			
psychiatric admission	1 (2.0)	2 (1.4)	0.113	1.000	
suicide attempt	0 (0.0)	2 (1.4)	0.674	1.000	

* missing data

population in employing coping strategies to deal with the pandemic situation, such as following a routine, talking with relatives or friends or maintaining a healthy lifestyle habits during the confinement. We found that individuals with psychiatric symptoms reported practicing physical exercise and maintaining a balanced diet to a lesser extent than the general population. This was not an unexpected result since there is considerable evidence that severe mental illnesses have low levels of physical activity (Stubbs et al., 2018). It is widely recognized that individuals with psychiatric disorders, in particular BD+SCZ, may present cognitive impairment and poor insight (Millan et al., 2012) which may limit their capacity to adhere to the coping strategies. These unhealthy behaviors, in turn, also contribute to increased clinical symptoms or relapses and may increase the risk of COVID-19 infection (see Fig. 1).

Patients also referred more difficulties in sleep routines and subjective sleep quality, as has been demonstrated in other studies (Voitsidis et al., 2020)(Kokou-Kpolou et al., 2020). However, it is noteworthy the high rates of sleep disturbances reported in both groups (clinical and non-clinical population), and particularly in the D+A group, with two thirds of respondents reporting sleep changes. Also this group of patients reported more psychotic-like experiences. Although these attenuated symptoms are associated to psychotic disorders, they are also associated with different psychiatric illnesses, such as patients with depression or anxiety disorders (Varghese et al., 2011). Moreover, previous studies have demonstrated that individuals with higher psychological stress are more likely to endorse this kind of experiences (Prochwicz et al., 2020), and depression is also associated to perceived stress.

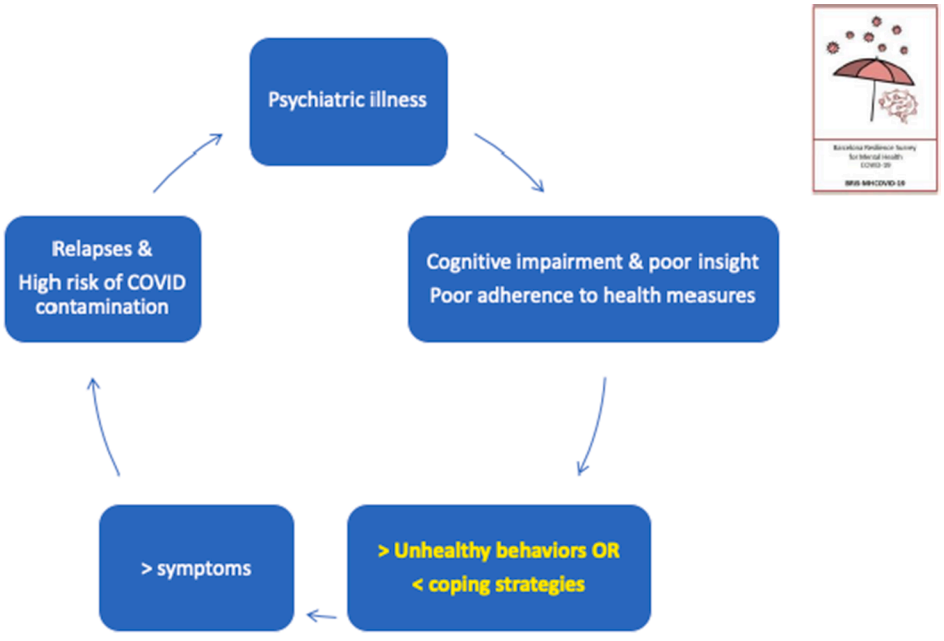


Fig. 1. Relation between unhealthy behaviors, risk of contamination and psychiatric illness.

Overall, the D+A group had a poorer healthy lifestyle than the control group, which suggests the importance of developing recommendations for maintaining healthy lifestyle habits to mitigate the negative health consequences of the COVID-19 pandemic. It is possible that individuals in the BD+SCZ group were less affected by the lockdown than the D+A group because most of them are not working, having more restricted social network and spending more time at home. Therefore, they could be a feeling that their global functioning during this period of time was more equal to that of the rest of the population. Maintaining everyday life praxis in the time of COVID-19 pandemic measures have been also emphasized by other studies performed in European countries with less stringent measures that in Spain (Pišot et al., 2020). In relation with healthy habits, obesity has been detected as a risk factor for developing adverse condition in COVID-19 patients (Földi et al., 2020).

Another factor that could mediate adaptive functioning during the mass lockdown is the affective temperament. Temperament refers to early-appearing individual differences in emotional reactivity, is stable across the lifespan, and has strong biological underpinnings (Akiskal and Akiskal, 2005). Depressive temperament is characterized by being pessimistic, highly self-critical, gloomy, and prone to excessive worrying and striving to please others. Anxious temperament, as a trait-like phenotype, is characterized by increased behavioral and physiological reactivity to mildly stressful stimuli, whereas cyclothymic temperament is outlined by shifts in mood, energy, behavior, and thinking. Both cyclothymic and anxious temperaments display increased stress reactivity in daily life, as well as enhanced desire for social contact (Walsh et al., 2013). Our results suggest that the cyclothymic/anxious combination, and depressive individuals, may be more likely to perceive the COVID-19 outbreak and related confinement measures as distressing, and to experience increased negative affect in response to social isolation. For instance, when diagnostic subgroups were analyzed, depressive and anxiety respondents in our survey reported more psychological distress, suffering more unpleasant events during the lockdown and more negative expectations about future consequences of COVID-19 pandemic than those in the BD+SCZ group. On the contrary, our results indicate that the hyperthymic temperament more present in the general population would protect against developing psychological symptoms in the face of a stressful event. This temperament is characterized by exuberant, upbeat, over-energetic, and overconfident lifelong traits, having a great relevance to territoriality and leadership (Akiskal et al., 2002). In previous studies, hyperthymic temperament was shown to be in direct and linear relation with resilience in major depressive disorder (Kesebir et al., 2015). However, other data show that the hyperthymic temperament had a uniquely protective effect on most mental disorders, with the exception of separation anxiety, bipolar, substance abuse and impulse control disorders (Karam et al., 2010). Recently, a study focused more specifically on affective temperament, attachment style and the psychological impact of the COVID-19 outbreak found that some specific temperaments (i.e. anxious, depressive and cyclothymic) predict the extent of mental health burden in an Italian population (Moccia et al., 2020), in line with our results.

Other factors including female gender, younger age, lower income, and lower level of education may also contribute to the higher severity of clinical symptoms (Fu et al., 2020)(Taylor et al., 2020).

The results from the BRIS-MHC study are in part in line with other similar studies including samples with psychiatric illness, showing higher scores in scales assessing depression, anxiety, and sleep disturbances in these individuals, during strict lockdown measures in other countries (Van Rheenen et al., 2020)(Hao et al., 2020)(Asmundson et al., 2020)(Bäuerle et al., 2020) and also in Spain (González-Blanco et al., 2020). Furthermore, the study by Asmundson and colleagues showed that people with anxiety-related disorders were the most affected by the COVID-19 pandemic, with greater fears about several consequences (Asmundson et al., 2020). Anxiety should be routinely assessed in psychiatric patients since it seems an early sign of greater vulnerability to psychological distress to face the pandemic (González-Blanco et al., 2020).

In contrast, no significant differences emerged concerning direct variables related to psychiatric problems, such as hospital admissions, accessing emergency psychiatric services, or number of suicide attempts during the lockdown, with similar frequencies in both groups (clinical and non-clinical respondents), and also without differences when both groups of psychiatric patients (D+A vs. BD+SCZ) were compared, probably in part because people were afraid to go to hospitals due to the external situation. Psychiatric patients had reduced their contact with mental health services during the strict lockdown, or this changed to remote contact. Nonetheless, it is a shared opinion that the mental health consequences of the COVID-19 pandemic will be probably shown in the long term. As a consequences, information on the longitudinal psychological effect of the pandemic will be of interest (Vindegaard and Eriksen Benros, 2020). Health professionals have had to find new methods to attend to patients (mental health home hospitalization (Garriga et al., 2020), phone or video call follow-ups or consultations, etc.). While physical connectivity, by way of widespread travel, has accelerated the spread of the disease around the planet, electronic connectivity provides a tool that, if used responsibly, can mitigate its effects (Kontoangelos et al., 2020). In this vein, several opportunities are emerging for improving care via telehealth, virtual platforms or smartphones (Torous and Keshavan, 2020). Moreover, different reviews are being published providing guidelines for the treatment of specific psychiatric illness during the pandemic (de Siqueira Rotenberg et al., 2020). According to our data, patients may benefit from psychological interventions focused on promoting health behaviors, such as relaxation exercises, sleep hygiene, scheduling routine activities, and offering adaptive coping strategies (Stefana et al., 2020). Hence, the promotion of proactive coping strategies seems to be a useful intervention to help patients to deal with pandemic-derived stressors. Consequently, stress management may reduce clinical symptomatology associated with depression, anxiety and relapses (Ho et al., 2020)(Hao et al., 2020). In fact, clinicians in mental health services provided aspects related with this kind of psychological interventions to their patients via telepsychiatry during the lockdown.

The present results must be interpreted in light of some limitations. First of all, the results may not be generalizable to all psychiatric patients since results come from a voluntary online survey, and also are restricted to a geography and sociocultural context. Even though most of the patients attended the Mental Healthcare of the Hospital Clinic of Barcelona and were invited to complete the survey, the presence of a psychiatric diagnosis and the clinical characteristics were self-reported. Similarly, community controls also had to self-report not suffering from a psychiatric disorder. As a consequence, the reliability of this information might be doubtful in a small proportion of the cases. Nevertheless, it is important to underlie that most patients visited in the above mentioned Mental Healthcare service have taken part of psychoeducation programs, bringing up an increasing of their illness awareness and insight. Results may be also influenced by the specific moment when the survey was conducted and depending on the different levels of restrictions; therefore fear, apprehension or uncertainty may be reduced and people may start to have some social interactions outside of the home. This is a cross-sectional study, so the design precludes establishing causal inferences. We hope that our follow-up study may help to clarify some associations detected in this first study. Furthermore, females, who are more vulnerable to stress and depression than men, are also over-represented in our sample. Concerning the BD+SCZ sample, it was also overrepresented by bipolar disorder patients; therefore the findings of the present study might be read in the light of this consideration. Lastly, our survey use proxies of different validated scales to make it easier for participants to answer and complete the survey, so results should be interpreted with caution or as first indications.

In conclusion, the evolution of COVID-19 still remains unpredictable, and the subsequent socio-economic crisis around the world makes us

think that is important to stay vigilant for signs of psychiatric illness in high-risk populations by implementing early interventions. Likewise, individuals with pre-existing mental illness tend to present cognitive deficits and poor insight making them a vulnerable population with a reduced ability to use coping strategies and increased unhealthy behaviors, with exacerbation of symptoms or relapses as a consequence (Shinn and Viron, 2020). The number of hospital admissions or emergency rooms visits during the lockdown decreased (Pacchiarotti et al., 2020), but they may increase significantly in the next months after the pandemic and it will be necessary to reinforce the mental health care services (Vieta et al., 2020).

Further longitudinal studies should assess potential consequences of COVID-19 pandemic in both the general population and, specifically, in psychiatric patients (Moreno et al., 2020). Research in mental illness is necessary since this global situation is not over, and long-lasting mental health and functional consequences are anticipated to increase.

Declaration of Competing Interest

Dr. Vieta has received grants and served as consultant, advisor or CME speaker for the following entities (work unrelated to the topic of this manuscript): AB-Biotics, Abbott, Allergan, Angelini, AstraZeneca, Bristol-Myers Squibb, Dainippon Sumitomo Pharma, Farmindustria, Ferrer, Forest Research Institute, Gedeon Richter, Glaxo-Smith-Kline, Janssen, Lundbeck, Otsuka, Pfizer, Roche, SAGE, Sanofi-Aventis, Servier, Shire, Sunovion, Takeda, the Brain and Behaviour Foundation, the Generalitat de Catalunya (PERIS), the Spanish Ministry of Science and Innovation (CIBERSAM), EU Horizon 2020, and the Stanley Medical Research Institute.

Dr. Martínez-Aran has received funding for research projects and/or honoraria as a consultant or speaker for the following companies and institutions (work unrelated to the topic of this manuscript): Otsuka, Pfizer, AstraZeneca, Bristol-Myers Squibb, Lundbeck, the Spanish Ministry of Economy and Competitiveness and Instituto de Salud Carlos III.

The other authors declare no conflict of interest related to this manuscript.

Contributors

CT, NV, SA, LM and BS conceived the study and the survey, with substantial contributions from the other authors. CT, NV, SA, LM and BS did the literature search and wrote the first draft. All authors substantially participated in the final manuscript, which was reviewed, revised and approved by all authors.

Acknowledgments

The authors would like to thank the support of the Spanish Ministry of Science and Innovation; the CIBER of Mental Health (CIBERSAM); the Secretaria d'Universitats i Recerca del Departament d'Economia i Coneixement (2017 SGR 1365; 2017 SGR 1355) and the CERCA Programme / Generalitat de Catalunya. Dr. Carla Torrent is funded by the Spanish Ministry of Economy and Competitiveness, ISCIII, through a 'Miguel Servet' postdoctoral contract (CPI14/00175) and the Miguel Servet II (CPII19/00018). The study has been supported by a BITRECS project conceded to NV. BITRECS project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 754550 and from "La Caixa" Foundation (ID 100010434), under the agreement LCF/PR/GN18/50310006. This work has also been supported by the projects SLT006/17/00357 and SLT006/17/00345 in the "Pla estrategic de Recerca i Innovacio en Salut 2016–2020" (Health Department). CERCA (Programme/Generalitat de Catalunya).

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