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ORIGINAL ARTICLE

Psychosocial impact of the COVID-19 pandemic on patients with inflammatory bowel disease in Spain. A post lockdown reflection



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KEYWORDS

COVID-19;
IBD;

Abstract

Objectives: This multicenter cross-sectional study was conducted to assess the psychosocial impact of COVID-19 on patients with inflammatory bowel disease (IBD) in Spain during lockdown and the first wave of the pandemic.

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DASS-21;
 Pandemic;
 Lockdown;
 Depression;
 Anxiety;
 Stress

Patients and methods: A self-report questionnaire that integrated the Spanish version of the Depression, Anxiety and Stress Scale-21 items (DASS-21) and the Perceived Stress Questionnaire (PSS) was designed to gather sociodemographic data and information related to the effects of lockdown on the lives of IBD patients. Twelve IBD units invited their patients to answer the anonymous online survey between the 1st July and the 25th August 2020.

Results: Of the 693 survey participants with IBD, 67% were women and the mean age was 43 (SD 12). Sixty-one percent had ulcerative colitis, 36% Crohn's disease and 3% indeterminate colitis. DASS-21 scores indicate that during lockdown the estimated prevalence of depression was 11% [95% CI 8.2–13%], anxiety 20% [95% CI 17 to 23%] and stress 18% [95% CI 8.2–13%]. Multivariate analysis showed that the perceived high risk of COVID-19 infection because of having IBD and maladaptation to government measures to reduce the spread of disease doubled the risk of anxiety and stress during lockdown.

Conclusions: In the short-term, lockdown during the COVID-19 pandemic seemed to have an impact on the already affected mental health of our IBD patients in Spain.

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PALABRAS CLAVE

COVID-19;
 EII;
 DASS-21;
 Pandemia;
 Confinamiento;
 Depresión;
 Ansiedad;
 Estrés

Impacto psicosocial de la pandemia de COVID-19 en pacientes con enfermedad inflamatoria intestinal en España. Una reflexión posterior al confinamiento

Resumen

Objetivos: Este estudio transversal multicéntrico se llevó a cabo para evaluar el impacto psicosocial de la COVID-19 en pacientes con enfermedad inflamatoria intestinal (EII) en España durante el confinamiento y la primera ola de la pandemia.

Pacientes y métodos: Se diseñó un cuestionario de autoinforme que integraba la versión española de la Escala de Depresión, Ansiedad y Estrés-21 ítems (DASS-21) y el Cuestionario de Estrés Percibido (PSS) para recoger datos sociodemográficos e información relacionada con los efectos del confinamiento en la vida de los pacientes con EII. Doce unidades de EII invitaron a sus pacientes a responder a la encuesta anónima en línea entre el 1 de julio y el 25 de agosto de 2020.

Resultados: De los 693 participantes en la encuesta con EII, el 67% eran mujeres y la edad media era de 43 años (DE 12). El 61% tenía colitis ulcerosa, el 36% enfermedad de Crohn y el 3% colitis indeterminada. Las puntuaciones del DASS-21 indican que durante el encierro la prevalencia estimada de depresión fue del 11% [IC 95%: 8,2-13%], de ansiedad del 20% [IC 95%: 17-23%] y de estrés del 18% [IC 95%: 8,2-13%]. El análisis multivariante mostró que la percepción de alto riesgo de infección por COVID-19 por tener EII y la inadaptación a las medidas gubernamentales para reducir la propagación de la enfermedad duplicaban el riesgo de ansiedad y estrés durante el encierro.

Conclusiones: A corto plazo, el confinamiento durante la pandemia de COVID-19 pareció tener un impacto en la ya afectada salud mental de nuestros pacientes con EII en España.

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Introduction

With over 3.5 million deaths and 179 million confirmed COVID-19 cases as of 1st June 2021,¹ Spain is one of the most affected countries by the pandemic. Since the 14th of March of 2020 a number of emergency containment measures have been adopted, including a 6-week near-total lockdown during which most residents were made to stay at home at all times. Noticeable psychological distress and public panic were partly due to the false information being spread online² and the fear of contracting the virus.³ As has been reported in other hard-hit countries, such as China⁴ and Italy,⁵ the situation has had a

negative psychological impact (increased anxiety, depression and stress) on the general population.^{6,7} These studies have shown that people with a history of chronic illness are more likely to report increased anxiety and depression, possibly because they feel more vulnerable to contracting a new disease.

Inflammatory Bowel Disease (IBD) is a chronic inflammatory disease of the gastrointestinal (GI) tract that is highly prevalent in Spain, with an overall incidence of 16 cases per 100,000 people per year.⁸ IBD can have a negative impact on quality of life and the likelihood of patients developing depression, anxiety and/or stress is higher compared to the general population.⁹ During periods of exacerbation, signs of

anxiety and depression have been found in more than 80% and 50% of patients, respectively.^{10,11}

Because COVID-19 can trigger GI inflammation based on the mechanism by which SARS-CoV-2 enters cells via angiotensin-converting enzyme 2 receptors expressed on GI cells, there has been great concern about the effects of the virus on patients with IBD.¹² Furthermore, IBD patients are often treated with immunosuppressive therapies that could put them at more risk of infection.¹³

The aim of this study was to assess the psychosocial impact of the COVID-19 pandemic on patients with IBD across Spain, and to determine if the impact is associated to particular sociodemographic factors or effects of lockdown measures adopted by the Spanish government during the first wave of the pandemic between the 14th March and the 20th June of 2020.

Patients and methods

Study design and participants

This was an observational, multicenter, cross-sectional study approved by The Spanish Working Group on Crohn's Disease and Ulcerative Colitis (GETECCU).

Twelve IBD units invited their patients to answer the anonymous online survey via email or by using a QR code displayed at the unit. A link to the survey was also published on the GETECCU website and social media account. The survey was open between the 1st July 2020 and the 25th August 2020.

All patients diagnosed with IBD with 18 years of age or older were included. All participants responded voluntarily to the anonymous survey and indicated their informed consent within the survey. The procedures were clearly explained, and participants could interrupt or abandon the survey at any point without explaining their reasons for doing so.

GETECCU and the IBD units comply with the Organic Law 3/2018, 5 December, of protection of personal data and guarantee of digital rights. Survey results were anonymous, so no handling of personal data was involved. The study followed international ethical recommendations for clinical research in humans contained in the Helsinki Declaration of 1964 and its successive updates, as well as the recommendations of the Spanish Ministry of Health.

Survey development

The online survey was designed using the Google Forms electronic platform to capture the most important aspects related to the psychosocial impact of the COVID-19 pandemic on IBD patients.

The self-report questionnaire gathered sociodemographic data and information related to the effects of lockdown on the lives of patients with IBD. It integrated the Spanish version of the Depression, Anxiety and Stress Scale-21 items (DASS-21) and the Perceived Stress Questionnaire (PSS).

The survey was designed to assess the psychological impact of lockdown on patients with IBD, estimate the prevalence of psychiatric symptoms and identify associated

factors. It was also used to assess whether the psychological impact of COVID-19 on these patients was related to government measures to reduce the spread of the virus or to guidelines issued by GETECCU on how to manage IBD during the pandemic,¹⁴ and how the subjective impact of the pandemic has affected the management of the disease itself.

Statistical analysis

Samples characteristics were described, according to the nature of the variable in absolute and relative frequencies, as means \pm SD or medians. The prevalence of mental disorders during lockdown are expressed in 95% Confident Intervals. A possible relation between the mental health (depression, anxiety and stress) and features during lockdown was evaluated by means of Chi-squared calculating the odds-ratio (ORs) of each of the situations contemplated in the survey and caused by the pandemic. Subsequently, situations with a *p*-value of <0.05 were subjected to a multivariate analysis by logistic regression in order to adjust the crude OR. The statistical analyses were carried out with SPSS (IBM Corp. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY).

Results

Survey participants

A total of 693 IBD patients, with a mean age of 43, mostly women (67%) and with a median of 12 years after diagnosis, completed the survey. The characteristics of the study sample are presented in [Table 1](#). It should be noted that most were active workers and had high education levels. The most frequent affectionation was ulcerative colitis (61%).

Most participants stayed at home during lockdown (83%) and spent lockdown with their family (63%) but only 39% with children at home. Physical activity levels and sleep habits were adversely affected in 78% and 67% of respondents, respectively. In addition, 39% reported a decrease in income. Seventy percent of participants used social media more during lockdown and 68% sought information on the impact of COVID-19 on IBD (39% from a health care provider, 34% on social media, 48% on the internet and 29% from mainstream media).

One hundred and forty-six (21%) participants had a family member or close friend who had been diagnosed with COVID-19 and 40 (6%) had a family member or close friend who had died of COVID-19.

Ninety five percent reported to have complied with IBD treatment before the COVID-19 pandemic. Sixty percent of patients felt that they were more at risk of infection because of IBD and 63% felt they were at higher risk of severe COVID-19 than the general population. In both cases, over 35% of participants thought that this was due to IBD medication. Despite these fears, 95% complied with their treatment regimens. Moreover, in around 90% of cases the dates of intravenous or subcutaneous administration of biological therapies remained unchanged. Two thirds of patients (69%) were able to keep their scheduled doctor appointments over the phone during lockdown. Sixty three percent of the

Table 1 Participants characteristics.

n = 693 patients	
Age (years)	
Mean \pm SD	43 \pm 12
(Min–Max)	(18–84)
Time of diagnosis (years)	
Median [Percentile ₂₅ –Percentile ₇₅]	12 [5–21]
Sex (%)	
Male/female	33/67
IBD type (%)	
Ulcerative colitis	61
Crohn's disease	36
Indeterminate colitis	3
Education level (%)	
Primary	10
Secondary	42
University	48
Occupation (%)	
Unemployed	14
Student	5
Freelancer	6
Employee	62
Retired	13
Income (%)	
Low	25
Medium	70
High	5
Maintenance therapy (%)	
No treatment	6
5-aminosalicylic acid	17
Immunosuppressants	22
Biologics	50
Others	5
Corticosteroids (%)	
Yes	10
Healthcare provider (%)	
Public	93
Private	3
Both	6
Diagnosed with COVID-19 (N/%)	15/2
Require hospital admission/ICU (N)	3/0

patients reported IBD flare-up symptoms of which 36% considered they could be related to COVID-19.

In terms of adapting and complying with government measures to reduce the spread of infection, 38% reported to have adapted well and 57% indicated that they are very motivated to comply with future preventive measures.

Psychosocial impact of COVID-19 on survey participants

The estimate of any degree of mental disorders during confinement shows the following prevalence: DASS-21 scores indicate that 10.5% of patients experienced depression $CI_{95\%}$, (8.2–13%), 19.9% anxiety $CI_{95\%}$, (16.9–23%) and 17.8% stress

$CI_{95\%}$, (14.8–26.7%) during lockdown. Most cases fell into the mild and moderate categories (Table 2).

Association between participants characteristics, effects of the COVID-19 lockdown and DASS-21 scores

Bivariate associations between participants characteristics and DASS-21 depression, anxiety, and stress scores during lockdown are shown in Table 3. The crude Odds Ratio (ORc) between participant's personal situation and DASS-21 depression, anxiety, and stress scores during lockdown are shown in Table 4.

After adjusting the ORc, the personal situations experienced by participants during lockdown that were associated with depression were: "adverse effect on sleep habits", "experiencing flare-up symptoms during lockdown" and unemployment. Table 5 shows Adjusted OR (AOR) and significance level considering all these factors, being the greatest AOR, the disorders in sleep habits (AOR 2.68. $CI_{95\%}$: 1.23–5.88; $p = 0.014$).

A greater number of factors or situations were jointly associated with a state of anxiety. To the same three factors mentioned above for depression, "perceived high risk of COVID-19 infection", "maladaptation to government measures to reduce the spread of disease" and "spending lockdown with company at home" were also associated with anxiety. Change in sleep habits was the one with the greatest impact (AOR 2.98. $CI_{95\%}$: 1.66–5.37; $p < 0.001$).

The factors/situations associated with DASS-21 score for stress, after adjusting the ORc were: "being female", "perceived high risk of COVID-19 infection", "maladaptation to government measures", "experiencing flare-up(s) symptoms during lockdown" and "adverse effects on sleep habits". The latter had the greatest influence on this mental disorder (AOR 3.16, $CI_{95\%}$: 1.93–6.75; $p < 0.001$).

Discussion

The results of the self-reported questionnaires indicate that during the COVID-19 lockdown 11% of patients with IBD showed signs of depression, 20% of anxiety and 18% of stress.

These results are lower than those reported in studies in the general Spanish, Italian, Kuwaiti and Chinese populations during the pandemic,^{4,5,9,15} but they are consistent with a recent meta-analysis carried out across countries to estimate the pooled prevalence of depression (15.97%) and anxiety (15.15%) related to COVID-19.¹⁶ The effects of the pandemic on global mental health have been linked to the fear of SARS-CoV-2 infection, uncertainty and social isolation caused by COVID-19.¹⁷ This fear is higher in patients with IBD than in those without the disease.¹⁸ DASS-21 has previously been shown to be a reliable and valid measure for assessing mental health in general populations during the COVID-19 pandemic.^{4,5}

Pre-COVID studies in IBD patients have shown that they experience significantly more anxiety and depression compared to healthy controls,^{19,20} and these are important determinants of health-related quality of life.⁹ A recent meta-analysis²¹ confirms the high prevalence of symptoms of anxiety and depression in patients with Crohn's disease and active IBD (in up to a third and a quarter, respec-

Table 2 Prevalence mental disorders during the COVID-19 lockdown.

Disorder	% (n)	Any degree of mental disorder (%) ^a	CI 95%
<i>Depression-DASS-21</i>		10.5%	(8.2–13%)
No	89 (620)		
Mild	3.9 (27)		
Moderate	6.5 (45)		
Severe	0.1 (1)		
<i>Anxiety-DASS-21</i>		19.9%	(17–23%)
No	80 (555)		
Mild	8.5 (59)		
Moderate	8.7 (60)		
Severe	2.6 (18)		
Very severe	0.1 (1)		
<i>Stress-DASS-21</i>		17.8%	(15–27%)
No	82 (566)		
Mild	17 (115)		
Moderate	1.7 (12)		
<i>PSS-10-TOTAL (mean points)</i>		20	(19.9–20.3)

^a Any degree of mental disorder = (mild, moderate, severe or very severe).

tively), especially in women. Due to the importance of this problem, GETECCU published a document with recommendations for managing psychological problems in IBD patients, highlighting the importance of early detection of anxiety and depression.²²

Some studies have assessed the impact of COVID-19 on the mental health of patients with IBD, but the results are contradictory, partly because of cultural or social differences and of the diverse methodology employed to measure mental disorders. Trindade and Ferreira²³ carried out an online survey in April 2020 including 124 Portuguese patients and found that over 50% of them reported moderate to severe anxiety and over 20% reported moderate to severe depression. Similar to our study they showed that depressive symptoms and anxiety were associated with fear of contracting COVID-19 and experiencing IBD symptoms. However, the pandemic was not affecting adherence to medication, even though most participants thought they were at higher risk of infection because of it.²³ Another survey carried out in Saudi Arabia during the lockdown showed that almost half of the respondents had clinical anxiety, but showed no signs of depression.²⁴ Cheema and colleagues,²⁵ reported high rates of depression, anxiety and stress in 352 IBD patients in Australia assessed using the DASS-21 score chart during the pandemic. Even in those without a prior diagnosis of depression or anxiety, high rates of at least moderate to severe depression (34.9%), anxiety (32.0%) and stress (29.7%) were observed. Younger age, symptomatic disease, lack of access to an IBD nurse, lack of education on reducing infection risk and perceived increased susceptibility to COVID-19 were associated with at least moderate depression, anxiety or stress. Even if the prevalence found in our study is lower, the factors associated with mental disorders in IBD patients are similar.

We found that 60% of survey participants felt that they were at a higher risk of infection and 63% reported feeling at high risk of severe COVID-19 because of IBD. These

findings are consistent with a survey carried out in a Spanish IBD Unit²⁶ that found that fear of becoming infected was also the main concern reported by IBD patients. In a European survey that included 3815 participants from 51 countries, under a third of patients believed that IBD predisposed them to an increased risk of COVID-19 and nearly two-thirds of respondents stated that immunosuppressive drugs were associated with a higher risk of infection.²⁷ However, almost all (96%) had not stopped taking their IBD medications on their own initiative. Similarly, our study and others^{18,26} found that 95% of patients continued taking IBD medications during the pandemic.

Evidence to date indicates that IBD is not a risk factor for COVID-19 infection or hospitalization.²⁸ In addition, there is no evidence that IBD treatments increase susceptibility to infection or to more severe forms of the disease, although older IBD patients (>60 years) receiving corticosteroid treatment during the COVID-19 pandemic should be carefully observed.²⁹ Communicating emerging evidence to IBD patients through GETECCU and other patient associations is important to re-assure patients and mitigate their fears. In this sense, the use of new information technologies in daily life (and the increase we observed during the current pandemic) makes the presence of the medical team and the IBD Units essential. In our study, 70% of patients used social media more and almost 70% sought information on the impact of COVID-19 on IBD. The availability of data on IBD-specific clinical interactions are associated with alleviation of COVID-19 health concerns,³⁰ access to at least one IBD-specific clinical interaction (COVID-19 information letter from IBD team, interaction with IBD team or general practitioner, Crohn and Colitis UK website visit) is significantly associated with alleviating concerns.

Newly diagnosed IBD patients are more likely to experience anxiety during flare-ups and may feel more vulnerable to catching the virus. In our study, experiencing flare-up symptoms during lockdown was associated with higher

Table 3 Association between participants characteristics and DASS-21 scores for depression, anxiety and stress during the COVID-19 lockdown.

Variable	Depression 10.5% (73)	Any degree of Anxiety 19.9% (138)	Stress 17.8% (127)
<i>Age, years (mean ± SD)</i>	41.3 ± 11.5 (<i>p</i> = 0.127)	39.9 ± 10.9 (<i>p</i> < 0.0001)	40 ± 10.3 (<i>p</i> = 0.001)
<i>Time since diagnosis, years</i> <i>P₅₀ [P₂₅–P₇₅]</i>	13 [3.5–20] (<i>p</i> = 0.786)	10 [3–17.5] (<i>p</i> = 0.019)	12 [4–20] (<i>p</i> = 0.552)
<i>Sex</i>			
Male	10.0%	13.9%	10.4%
Female	10.8% (<i>p</i> = 0.726)	22.9% (<i>p</i> = 0.005)	22.3% (<i>p</i> < 0.001)
<i>Type IBD</i>			
Ulcerative colitis	12.8%	21.6%	19.4%
Crohn's disease	7.1%	17.5%	15.9%
Indeterminate colitis	5.3% (<i>p</i> = 0.052)	15.8% (<i>p</i> = 0.392)	26.3% (<i>p</i> = 0.3381)
<i>Education level</i>			
Primary	16.9%	36.9%	29.2%
Secondary	8.9%	18.8%	15.8%
University	10.4% (<i>p</i> = 0.16)	17.3% (<i>p</i> = 0.001)	18.2% (<i>p</i> = 0.035)
<i>Occupation</i>			
Retired/student	11.1%	15.9%	15.9%
Employee	7.9%	18.1%	17.2%
Unemployed	22.7% (<i>p</i> < 0.001)	33.0% (<i>p</i> = 0.002)	26.8% (<i>p</i> = 0.063)
<i>Income</i>			
Low	16.9%	26.2%	23.3%
Medium	9.1%	18.7%	17.2%
High	0% (<i>p</i> = 0.02)	7.7% (<i>p</i> = 0.016)	10.3% (<i>p</i> = 0.87)
<i>Treatment type</i>			
None	17.5%	22.5%	17.5%
Biologic	12.0%	20.3%	18.6%
Non-biologic	7.9% (<i>p</i> = 0.077)	19.1% (<i>p</i> = 0.843)	18.1% (<i>p</i> = 0.975)
<i>Corticosteroids/yes</i>	9.9% (<i>p</i> = 0.845)	21.1% (<i>p</i> = 0.787)	21.1% (<i>p</i> = 0.520)

DASS-21 scores, we speculate that scores are directly related to the activity of the disease. Our study also found significant associations between unemployment and DASS-21 scores for depression and anxiety during lockdown. Being a woman was associated with higher stress scores. These findings are consistent with studies looking at the psychological burden of COVID-19 in general populations.^{4,5} The adverse effects of the pandemic on the sleep habits were associated with higher DASS-21 scores for depression, anxiety and stress in IBD patients. These findings are not surprising, as an impairment of the quality of sleep is a symptom of anxiety, depression and stress, and contribute to validate the results. Our study did not find any association between

the use of corticosteroids or maintenance treatment with DASS-21 scores.

We can speculate that most of the associations described in this study could be explained by the already affected wellbeing of the IBD patients. However, the uncertainty and sudden changes that the population had to face could represent a trigger for the deterioration of mental health in patients with IBD as well. We also found that those who reported not adapting well to government measures had higher DASS-21 scores for anxiety and stress.

To protect IBD patients against depression, anxiety and stress, government agencies, healthcare professionals and patient associations, should encourage them to continue

Table 4 Association between the effect of the pandemic and DASS-21 scores for depression, anxiety and stress during the COVID-19 lockdown.

Variable	Depression 10.5% (73)	Anxiety 19.9% (138)	Stress 17.8% (127)
Stayed at home during lockdown, Yes	11.7% OR = 2.46 [1.06–5.68] (<i>p</i> = 0.034)	20.7% OR = 1.35 [0.80–2.29] (<i>p</i> = 0.225)	19.3% OR = 1.52 [0.87–2.67] (<i>p</i> = 0.142)
Cohabitants during lockdown, Yes	13.8% OR = 1.37 [0.63–2.97] (<i>p</i> = 0.3829)	10.3% OR = 0.42 [0.18–0.994] (<i>p</i> = 0.0587)	12.1% OR = 0.56 [0.26–1.26] (<i>p</i> = 0.1913)
Children at home, Yes	12.1% OR = 0.63 [0.38–1.07] (<i>p</i> = 0.0998)	19.5% OR = 1.06 [0.73–1.55] (<i>p</i> = 0.7707)	16.7% OR = 1.33 [0.89–1.94] (<i>p</i> = 0.1913)
Increase use of social networks, Yes	10.9% OR = 1.23 [0.66–1.93] (<i>p</i> = 0.7667)	20.1% OR = 1.04 [0.69–1.50] (<i>p</i> = 0.9172)	19.3% OR = 1.24 [0.81–1.92] (<i>p</i> = 0.3894)
Did you obtain information on the impact of COVID-19 on IBD patients? Yes	9.3% OR = 0.67 [0.41–1.10] (<i>p</i> = 0.1425)	18.4% OR = 0.74 [0.50–1.09] (<i>p</i> = 0.1518)	16.9% OR = 0.74 [0.50–1.911] (<i>p</i> = 0.1788)
Do you think you are more at risk of infection because of IBD? Yes	12.5% OR = 1.75 [1.03–2.97] <i>p</i> = 0.0430	25.8% OR = 2.77 [1.80–4.26] <i>p</i> < 0.0001	25.3% OR = 3.94 [2.4–6.40] <i>p</i> < 0.0001
Do you think you are at a higher risk of severe COVID-19 because of IBD?, Yes	12.8% OR = 2.05 [1.17–3.60] <i>p</i> = 0.0143	23.7% OR = 2.02 [1.33–3.08] <i>p</i> = 0.0008	22.1% OR = 2.13 [1.37–3.31] <i>p</i> = 0.0007
Have you experienced a flare-up(s) during lockdown? Yes	16.5% OR = 2.61 [1.60–4.25] <i>p</i> = 0.0002	31.3% OR = 3.91 [1.98–4.25] <i>p</i> < 0.0001	27.9% OR = 2.65 [1.79–3.392] <i>p</i> < 0.0001
How do you think you adapted to government measures to reduce the spread of COVID-19? No	6.3% OR = 2.61 [1.60–4.25] <i>p</i> = 0.0002	27.5% OR = 3.91 [1.98–4.25] <i>p</i> < 0.0001	25.8% OR = 2.65 [1.79–3.39] <i>p</i> < 0.0001
Are you motivated to comply with future measures to come out of lockdown safely? Yes	15.3% OR = 1.87 [1.13–3.10] <i>p</i> = 0.0172	25.1% OR = 1.52 [1.52–2.28] <i>p</i> = 0.0411	25.1% OR = 1.78 [1.18–2.17] <i>p</i> = 0.0073
Effect of lockdown on physical activity, worsened	12.3% OR = 3.32 [1.60–4.25] <i>p</i> = 0.0024	22% OR = 2.04 [1.20–3.46] <i>p</i> = 0.0074	20.7% OR = 2.50 [1.40–4.47] <i>p</i> = 0.0012
Reduced income, Yes	10.4% OR = 0.98 [0.60–1.60] <i>p</i> = 1.000	23% OR = 1.37 [0.94–1.99] <i>p</i> = 0.1180	20.1% OR = 1.21 [0.82–1.78] <i>p</i> = 0.3650
Effect of lockdown on sleep habits, worsened	14.1% OR = 4.56 [2.18–9.53] <i>p</i> < 0.001	26.2% OR = 4.47 [2.63–7.60] <i>p</i> < 0.001	24.7% OR = 5.49 [3.04–9.91] <i>p</i> < 0.001

OR: crude odds ratio; CI95%: confidence interval 95%.

taking their current medications to maintain remission and avoid relapses. Other measures to reduce the psychological burden of COVID-19 on IBD patients, and the general population, should focus on encouraging healthy behaviours such as exercising, improving sleep quality and eating a balanced diet.⁷

Our study has several limitations including those related to the fact that we used an online survey, did not have a DASS-21 baseline or the history of patients' mental health before the pandemic, or equivalent data from people without IBD. Future surveys on IBD patients and the general

populations will shed further light on the psychological impact of COVID-19 on different subgroups.

Our findings highlight the effect of the COVID-19 pandemic on the mental health of IBD patients in Spain and contributes to the development of more targeted preventive and support strategies and interventions for this and other similar situations. Lessons learned from this pandemic underline the importance of pre-establishing different communication channels and the development of innovative solutions that provide patients the most accurate and up-to-date general and medical information, to mitigate

Table 5 Adjusted odds ratio for effect of the pandemic on DASS-21 scores for depression, anxiety and stress during the COVID-19 lockdown.

	<i>B</i>	AOR	CI95% AOR	<i>p</i>
<i>Depression</i>				
Unemployed	0.890	2.43	1.34–4.42	0.030
Sleep habit changes	0.988	2.68	1.23–5.88	0.014
Flare-up(s) symptoms	0.687	1.98	1.18–3.34	0.010
<i>Anxiety</i>				
Unemployed	0.569	1.77	1.03–3.01	0.037
Sleep habit changes	1.095	2.98	1.66–5.37	<0.001
Flare-up(s) symptoms	0.832	2.29	1.52–3.84	<0.001
Feeling at more risk of infection because of IBD	0.701	2.02	1.22–3.44	0.006
Maladjustment to government measures	0.835	2.30	1.45–3.65	<0.001
Spent lockdown in company	0.7	2.7	1.07–6.6	0.035
<i>Stress</i>				
Female	0.598	1.82	1.09–3.04	0.022
Sleep habits changes	1.284	3.16	1.93–6.75	<0.001
Feeling at more risk of infection because of IBD	1.195	3.30	1.97–5.52	<0.001
Flare-up(s) symptoms	0.715	2.04	1.34–3.12	<0.001
Maladjustment to government measures	0.690	1.99	1.25–3.18	0.004

B: logistic regression coefficients; AOR: adjusted odds ratio; CI95%: confidence interval 95%.

fears and the impact on mental health without burdening current services.

In conclusion, in the short-term, lockdown during the COVID-19 pandemic seemed to have an impact on the mental health of IBD patients in Spain. Further follow-up studies should be carried out to determine the real long-term impact, as the wellbeing of this population might be affected by IBD itself.

Ethical considerations

The study followed international ethical recommendations for clinical research in humans contained in the Helsinki Declaration of 1964 and its successive updates, as well as the recommendations of the Spanish Ministry of Health. The study was approved by the Hospital Universitario Nuestra Señora de Candelaria, Santa Cruz de Tenerife, Spain, review board.

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Conflicts of interest

AHC has served as a speaker or has received education funding from AbbVie, Takeda, Kern Pharma, Pfizer, Janssen, Adaclyte Therapeutics and Ferring. LR has served as a speaker or has received education funding from MSD, AbbVie, Takeda, Janssen and Ferring. MBDA has served as a speaker, consultant and advisory member for or has received

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