Questionnaire-Based Study of 81 Patients in Poland to Evaluate the Course of Inflammatory Bowel Disease and the Effects of the COVID-19 Pandemic on Quality of Life and Mental State from February to June 2021

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

BCE 1 **Natalia Owsianko** (iD)
CDF 1 **Natalia Romańczuk-Osenka**
ABD 1 **Martyna Szczerbakow**
BCE 1 **Katarzyna Pikora**
CDE 1 **Katarzyna Sowa**
ADE 2 **Urszula Daniluk**
CD 1 **Paweł Rogalski**
DEF 1 **Agnieszka Świdnicka-Siergiejko**
E 1 **Stefania Antonowicz** (iD)
E 3 **Michalina Krzyżak**
E 4 **Dominik Maślach**
AE 1 **Andrzej Dąbrowski**
ADFG 1 **Jarosław Daniluk**

1 Department of Gastroenterology and Internal Medicine, Medical University of Białystok, Białystok, Poland
2 Department of Pediatrics, Gastroenterology, Hepatology, Nutrition and Allergology with the Pulmonology Subdivision, Medical University of Białystok, Białystok, Poland
3 Department of Hygiene, Epidemiology and Ergonomics, Medical University of Białystok, Białystok, Poland
4 Department of Public Health, Medical University of Białystok, Białystok, Poland

Corresponding Author: Jarosław Daniluk, e-mail: jaroslaw.daniluk@umb.edu.pl
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Background: The COVID-19 pandemic affected many people worldwide, including those with chronic diseases. Our objective was to analyze its influence on medical care and the course of inflammatory bowel disease (IBD) in Poland.

Material/Methods: In 2021, 81 patients in Poland with IBD completed an original anonymous questionnaire about the impact of the COVID-19 pandemic on the course of their disease and mental status. The printed questionnaire was distributed to IBD patients treated at the Gastroenterology Outpatient Clinic of the University Clinical Hospital in Białystok, and an online questionnaire was sent to patients via social media. Statistical analysis was performed using the chi-squared test, with a significance level of $P<0.05$.

Results: The study group consisted of 46 women and 35 men with a mean age of 32.42 years. Fifty-nine patients had ulcerative colitis and 22 had Crohn disease. Patients reported significant deterioration in medication availability (50.62%) and restricted access to gastroenterology outpatient clinics (51.90%) ($P<0.05$). Of patients who contracted COVID-19, 89.47% did not require hospitalization, 32.10% (26/81) were asymptomatic, mild, or moderate, despite immunosuppressive biological treatment (27.16%, 22/81), or steroids (18.52%, 15/81). Over 50% of respondents stated the pandemic negatively affected their mental state and 30% of them associated that with worsening IBD.

Conclusions: During the pandemic, respondents were mainly concerned with difficulties in accessing the gastroenterology clinic and limited drug availability. The pandemic negatively affected patients' mental state. In cases of COVID-19 disease, patients with IBD were mostly asymptomatic and did not require hospitalization, despite therapy affecting the immune system.

Keywords: Colitis, Ulcerative • COVID-19 • Crohn Disease • Inflammatory Bowel Diseases • Poland

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Background

In December 2019, a new variant of coronavirus emerged in Wuhan, China [1]. It was later named by the International Committee on Taxonomy of Viruses as SARS-CoV-2 [2]. This new virus had spread worldwide in early 2020 and led to the World Health Organization identifying the COVID-19 outbreak as a pandemic on March 11, 2020 [3]. The most common symptoms of COVID-19 disease are fever, dry cough, and fatigue, but there are also less specific symptoms, such as different types of skin rash, nausea, vomiting, and diarrhea [4]. In Poland, from January 3, 2020, to January 12, 2022, there have been 4 248 559 reported cases of COVID-19, with 100 938 associated deaths [5].

The pandemic has had a negative impact on the global economy, healthcare, and everyday life [6]. The pandemic was especially challenging for people with chronic diseases, considering that some of the hospitals were focused on patients with COVID-19 patients, and therefore, diagnostic tests and hospital admissions for patients with chronic diseases were postponed [7]. Inflammatory bowel disease (IBD) is a group of disorders that consists of 2 forms: Crohn disease (CD) and ulcerative colitis (UC). These conditions are characterized by chronic inflammation of the gastrointestinal tract that is caused by a defective immune system. Poland is considered to have a moderate prevalence of IBD, which affects approximately 157 of 100 000 individuals [8]. Most patients with IBD require long-term treatment, regular medical appointments, and diagnostic tests, all of which may have been disrupted by the pandemic [9]. Recently, major international organizations published guidelines and strategies for the management of patients with IBD during the pandemic [10,11]. The incidence of COVID-19 in patients with IBD was low and similar to that of the general population. Unfortunately, in patients infected with SARS-CoV-2, treatment with corticosteroids or mesalamine was significantly associated with worse outcomes, compared with that of anti-TNF therapies [12,13].

This questionnaire-based study of 81 patients in Poland with a diagnosis of IBD aimed to evaluate the course of the disease and the effects of the COVID-19 pandemic on patients' quality of life and mental state from February to June 2021.

In this study, we analyzed the impact of the COVID-19 pandemic on medical care and the course of IBD in patients using a questionnaire-based analysis. Our hypothesis assumed that the COVID-19 pandemic caused limited access to specialist treatment and negatively affected the course of IBD.

Material and Methods

Ethical Approval and Informed Consent

This investigation was reviewed and approved by the local ethics committee (approval no. APK.002.247.2021), and was conducted in accordance with the Helsinki Declaration. All patients were informed about the conducted research and data collection, and a written informed consent form was obtained from each patient. Participation in the study was voluntary and the participants could withdraw at any time during the study.

Study Design and Population

An observational, anonymous survey study was conducted using a questionnaire to evaluate the impact of the COVID-19 pandemic on access to medications and treatment, including difficulties in obtaining consultations at gastroenterology (outpatient) clinics in patients with the 2 forms of IBD: CD and UC. Additionally, the study was designed to investigate the impact of SARS-CoV-2 infection on the course of IBD and the influence of the pandemic on the mental well-being of patients. The study group consisted of patients with IBD who were admitted to the Gastroenterology and Internal Medicine Department and Outpatient Clinic and patients from all over Poland who voluntarily responded to a questionnaire posted via social media from February to June 2021. Clinical symptoms, biochemical testing, such as blood counts, C-reactive protein, and liver enzymes, imaging, endoscopic, histopathological (analysis of endoscopy-derived sections), and stool (fecal calprotectin) examinations were all used to identify IBD in patients [14]. The CDAI scale and Mayo scale were used to assess disease activity in CD and UC, respectively.

Study Protocol

The study was conducted from February to June 2021 in the form of a personalized questionnaire, which was created by the authors of the study, at the Department of Gastroenterology and Internal Medicine, Medical University of Białystok (**Table 1**). The questionnaire was addressed to patients with IBD who were aged over 16 years and from Białystok (printed questionnaire) and all over Poland (online questionnaire). The group of respondents consisted of 81 patients.

The online questionnaire, designed in the Polish language using Google Forms, was electronically distributed on February 15, 2021, via social media and applications (Facebook, WhatsApp, Instagram) to patients with IBD, as well as via medical groups associated with patients with CD and UC. The printed questionnaire, also designed in the Polish language using Microsoft Word, was distributed from February to June 2021 to patients with UC and CD treated at the Department of Gastroenterology and Internal Medicine outpatient clinic of the University Clinical

Table 1. Items on the questionnaire.

General questions about inflammatory bowel diseases (IBD)	1. Type of IBD 2. When was the diagnosis initially made? 3. What is the current disease activity? 4. What are the predominant symptoms of IBD? 5. What drug groups are currently being used? 6. Has there been an exacerbation of the disease during the pandemic? 7. Has treatment changed during the pandemic, and if so, what has changed? 8. Are there any comorbidities?
Questions about medical care during the COVID-19 pandemic	1. Was there a problem with access to the gastroenterology clinic, and if so, what was the problem? 2. Were visits made via telemedicine, and if so, what is the opinion of it? 3. Were epidemiological protection measures maintained during in-person visits? 4. How do patients rate access to medications before and during the pandemic? 5. Were patients hospitalized for IBD during the pandemic, and if so, what was the cause? 6. Did patients have COVID-19? 7. Was the COVID-19 disease confirmed by the RT-PCR test? 8. What was the course of SARS-CoV-2 virus infection? 9. Do patients believe that contracting COVID-19 affected the course of IBD, and if so, how?
Questions about the impact of the COVID-19 pandemic on the mental state of patients	1. Did the pandemic affect mental well-being, if so, how? 2. How did the change in mental health affect IBD? 3. Did patients encounter other difficulties in treating IBD during the pandemic that were not mentioned in the survey?

Hospital in Białystok. The duration of data collection and analysis was 5 months.

The original questionnaire was divided into 3 parts and contained 32 questions. The first part contained basic information on sex, age, level of education, and questions about past history of IBD, namely, date of diagnosis, predominant symptoms, current treatment, and flares of the disease. The second part concerned medical care during the COVID-19 pandemic and included questions about difficulties in obtaining medical care at the gastroenterology outpatient clinic, telemedicine, access to medications, and hospitalizations related to diagnostic procedures, exacerbation of symptoms, and treatment modifications for IBD. Questions about SARS-CoV-2 infection, the severity level of infection, and its influence on UC and CD courses were also included. The third part of the proprietary questionnaire concerned the effects of the COVID-19 pandemic on the mental health of patients with IBD. Questions also analyzed the influence of changes in mental well-being on the course of the underlying disease.

To determine the effect on mental health in the era of the COVID-19 pandemic, a 5-step visual analog scale was used, where 1 indicated that there was no negative effect on mental health and/or the course of IBD, and 5 indicated there was a major negative impact. This scale was intended to allow a subjective assessment of the mental state of patients before and during the COVID-19 pandemic. The questions prepared by the authors were reviewed by an expert gastroenterologist for consistency and appropriateness. **Table 1** shows a summary of questions from the questionnaire.

Statistical Analysis

The data were collected in Excel and then manually verified by the investigators. To avoid duplication of data, each respondent was assigned a unique Email address. Then, statistical analysis was performed with Statistica 13 software. Results were presented as mean±SD or number of patients and percentage of the total study group. The chi-square test was used to determine possible pandemic-induced changes in access to medications and difficulty obtaining consultations at gastroenterology clinics in patients with IBD. Continuous variables, such as age, were analyzed by establishing a defined data cutoff point to create 2 comparable groups. A P value <0.05 was considered statistically significant.

Results

Eighty-one patients with IBD participated in the study, and included 46 women and 35 men. The age of most patients (59.26%) ranged from 18 to 35 years. A total of 59 patients

Table 2. Demographic characteristics of the study group.

Total	**81**	**(100.0%)**
Sex		
Women	46	(56.79%)
Men	35	(43.21%)
Age		
<18	3	(3.70%)
18-25	22	(27.16%)
26-35	26	(32.10%)
36-45	18	(22.22%)
46-55	8	(9.88%)
>55	4	(4.94%)
Education		
Primary	6	(7.41%)
Vocational	6	(7.41%)
Secondary	32	(39.51%)
Higher	37	(45.68%)
Residence		
Rural	14	(17.28%)
City to 25 000	11	(13.58%)
City 25 000-50 000	7	(8.64%)
City 50 000-100 000	7	(8.64%)
City 100 000-250 000	4	(4.94%)
City 250 000-500 000	23	(28.40%)
City >500 000	15	(18.52%)
Disease		
Ulcerative colitis (UC)	59	(72.84%)
Crohn's disease (CD)	22	(27.16%)

(42/59) of patients had UC (UC-o) and 63.64% (14/22) had CD (CD-o). We divided patients into age groups to assess potential differences in access to technology, namely, telemedicine video calls and chats with a health care professional, and to evaluate the course of COVID-19 disease and its impact on IBD activity in relation to patient age. The respondents mainly had higher (45.68%) or secondary (39.51%) education, 28.40% lived in a city with a total population of 250 000 to 500 000, 18.52% lived in a city with a population larger than 500 000, and 17.28% lived in the countryside. **Table 2** shows the demographic characteristics of the study group.

The most common comorbidities were hypertension (5/81, 6.17%), asthma (5/81, 6.17%), inhalant and food allergies (4/81, 4.94%), thyroid disease (4/81, 4.94%), osteoporosis (3/81, 3.70%), depression (3/81, 3.70%), rheumatoid arthritis (2/81, 2.47%), and atopic dermatitis (1/81, 1.23%).

Disease Activity and Treatment

At the time of completing the questionnaire, 56.80% of respondents declared that their disease was currently in clinical remission (UC 33/59, 55.93%, CD 13/22, 59.09%). The remaining 43.20% were in active disease, based on symptoms. Patients with CD most frequently reported abdominal pain (18/22), weight loss (11/22), weakness (8/22), diarrhea (8/22), ulcers (8/22), fissures (6/22), and perianal fistulas (6/22). The most frequently used forms of therapy in patients with CD were biological treatment (10/22), aminosalicylates (8/22), and immunosuppressive drugs (7/22), or no treatment (4/22). In contrast, patients with UC reported mostly diarrhea (52/59), blood in the stool (49/59), weakness (41/59), abdominal pain (40/59), and weight loss (30/59). Patients with UC most commonly used aminosalicylates (51/59), immunosuppressants (19/59), steroids (15/59), biological treatment (12/59), or no medication (2/59).

Exacerbation of disease during the COVID-19 pandemic in patients with UC (43/59, 72.90%) was significantly more frequent than in those with CD (9/22, 41.00%), with $P<0.05$. During the pandemic, nearly 40% of patients reported changes in IBD treatment, with 44.07% (26/59) of patients with UC and 27.27% with CD (6/22). The most common change (68.75%) was in the form of adding a new drug, changing 1 or more drugs to another (37.50%), modifying the dosage of a previously used drug (34.38%), or discontinuing a drug (21.88%) (**Figure 1**).

Almost one-half of patients (40/81, 49.40%; IBD-y 12/25, 48.00%; and IBD-o 28/56, 50.00%) were hospitalized during the pandemic (from March 2020 to June 2021) due to the IBD course. The most frequent reasons for hospitalization included disease exacerbation, diagnostics related to the severity of the inflammatory bowel disease, or change in treatment.
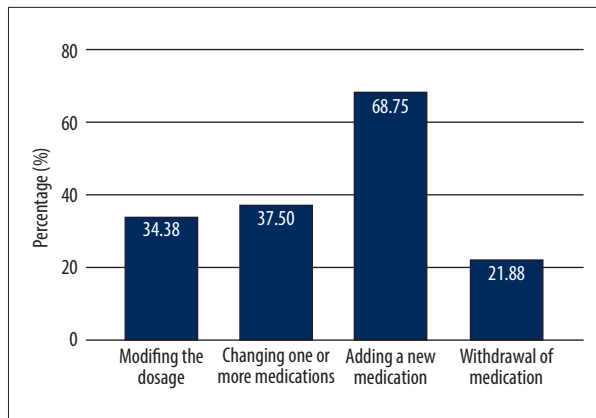
had UC and 22 had CD. The study group differed in terms of education and place of residence (**Table 2**). Most patients with UC (37.29%) received a diagnosis 5 to 15 years ago. For those with CD, results were spread across several groups: 27.27% of respondents received a diagnosis 1 to 3 years ago; 22.72%, 5 to 15 years ago; 18.18%, less than a year ago; and 18.18%, more than 15 years ago. Only 15 patients received a diagnosis within the last year (newly diagnosed), of whom 3 had CD (13.64%) and 12 had CU (20.34%). For the purpose of the study, we divided the IBD group into 2 subgroups: IBD-young (IBD-y) including patients 25 years old or younger (25/81, 30,86%) and IBD-old (IBD-o) with patients above 25 years old (56/81, 69,13%). Among the patients in the IBD-y subgroup, 28.81% (17/59) had UC (UC-y) and 36.36% (8/22) had CD (CD-y). Among the older patients in the IBD-o subgroup, 71.19%

Figure 1. Changes in treatment in patients with inflammatory bowel diseases during the COVID-19 pandemic (Word 2021, Microsoft office).

Factors Influencing IBD Control

From March 2020, there was a statistically significant deterioration in availability to gastroenterological treatment compared with the time before the pandemic ($P<0.05$). Overall, 51.90% (42/81; CD-y 4/8; CD-o 7/14; UC-y 11/17; and UC-o 20/42) of respondents reported a problem in treatment availability, independent of IBD type (CD 50.00% vs UC 52.00%, $P>0.05$), patient age (older 48.20% vs younger 60.00%, $P>0.05$), disease activity (active disease 43.20% vs 56.80% remission, $P>0.05$), place of residence (>250 000 inhabitants vs <250 000 inhabitants, $P>0.05$), and educational status (higher education vs primary + secondary education, $P>0.05$). Among the reported problems in obtaining a consultation by a gastroenterologist, the most frequently mentioned were difficulties in scheduling (73.81%), postponing an appointment (38.10%), and hospitalization (33.33%), and difficult access to examinations (33.33%). Other concerns included cancellation of an appointment (21.43%), hospitalization (16.67%), and change of attending physician (14.29%) (**Figure 2**).

For 58.02% (47/81) of patients, appointments were performed with the use of telemedicine technology regardless of the IBD type (CD 54.50% vs UC 59.00%) and patient age (older 52.00% (29/56) vs younger 72.00% (18/25), $P>0.05$). More than one-half of patients (55.32%, 26/47), both younger and older (50.00% IBD-y vs 58.62% IBD-o), gave a positive evaluation of telemedicine as a form of contact with a physician. Also, no differences were found between the use of telemedicine and place of residence (>250 000 inhabitants [53.49%, 23/43] vs <250 000 inhabitants [63.16%, 24/38]), $P>0.05$), or educational status (higher education [48.65%, 18/37] vs primary + secondary education [65.91%, 29/44], $P>0.05$). Another important issue was the access to medications during the COVID-19 pandemic. Before the pandemic, 23.46% (19/81) of patients reported poor access to medications, whereas during the pandemic
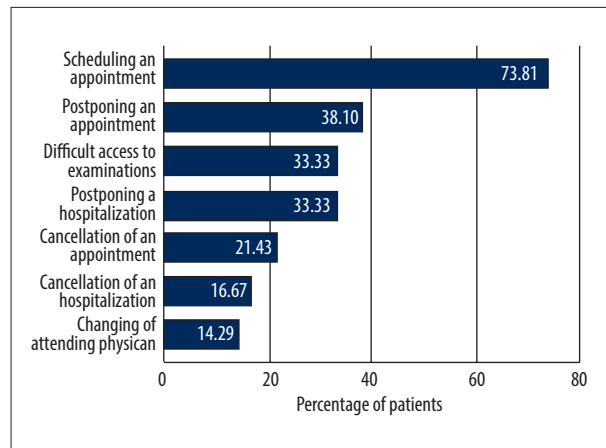

Figure 2. Difficulties reported by patients with inflammatory bowel diseases in obtaining consultation by a gastroenterologist during the COVID-19 pandemic. (Word 2021, Microsoft office).
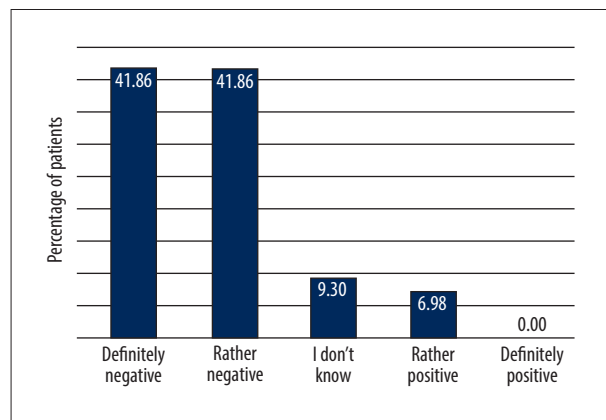

Figure 3. Questionnaire scoring of the mental state of patients with inflammatory bowel disease during the COVID-19 pandemic: 1, definitely negative impact of pandemic on the mental status; 2, rather negative impact of pandemic on the mental status; 3, difficult to assess impact of pandemic on the lowering of mental status; 4, rather positive impact of pandemic on the mental status; 5, definitely positive impact of pandemic on the mental status (Word 2021, Microsoft office).

this number increased to 62.96% (51/81). We therefore concluded that patients reported a significant decrease ($P<0.05$) in access to prescribed drugs, such as lack of mesalazine in the form of tablets, and reduction of suppositories reimbursement.

COVID-19 and the Course of IBD

Seventeen patients (20.99%, including 20.00% IBD-y and 21.42% IBD-o) had COVID-19, but the majority (15/17, 88.24%, CD-y 2/2, CD-o 3/3, UC-y 2/3, UC-o 8/9) did not require hospitalization and assessed the course of the disease as asymptomatic, mild, or moderate. However, 7 of 17 infected patients

(41.18%) declared that the infection negatively affected the course of the underlying disease, with noticeable exacerbation of existing symptoms (6/17, 35.29%; IBD-y 1/5, 20.00%; and IBD-o 5/12, 41.65%), appearance of new symptoms (2/17, 11.76%; only IBD-o 2/12, 16.67%), and the need for hospitalization (2/17, 11.76%; only IBD-o 2/12, 16.67%) in the gastroenterology department.

From all respondents, 53.09% (43/81, IBD-y 18/25, 72.00% and IBD-o 25/56, 44.64%,) believed that the pandemic had influenced their mental well-being (IBD-y vs IBD-o, $P<0.05$), and 83.72% (36/43) of them (IBD-y 14/18, 77.78% and IBD-o 22/25, 88.00%, $P>0.05$) determined this impact was negative (**Figure 3**). Among those patients, 58.13% (25/43; IBD-y 9/25, 36.00%; and IBD-o 16/25, 64.00%) associated the decrease of mental well-being with a worse course of IBD.

Discussion

We conducted a survey to investigate the impact of the COVID-19 pandemic on the medical care of patients with IBD in Poland. The results indicated that the pandemic had multiple effects on those patients. We observed difficulties in accessing gastroenterology outpatient clinics, in scheduling hospitalization, and in accessing prescribed medications. Our results also suggested that most patients had mild to moderate SARS-CoV-2 infection and did not require hospitalization for COVID-19. In addition, we observed that only a small fraction of patients actually contracted SARS-CoV-2 infection. More than one-half of patients pointed out that online consultations replaced regular visits in the gastroenterology outpatient clinic. Moreover, the majority indicated that they were satisfied with this form of contact with doctors, regardless of the patient's age. Finally, an analysis of the questionnaire showed that more than one-half of the patients observed that the COVID-19 pandemic affected their mental well-being, most of them negatively.

Many of the patients in our study, due to the changing epidemiological situation, experienced difficulties accessing gastroenterology clinics and making follow-up appointments. They also indicated problems with postponed or rescheduled hospitalizations. Another published study also showed a significant decrease in hospitalizations in patients with IBD, mainly during the initial phase of the COVID-19 pandemic, primarily due to the heavy burden of patients with COVID-19 filling hospital beds [15]. It is remarkable that the incidence of hospitalization of patients with UC and CD has decreased considerably in the last decade, especially in patients under 40 years of age; therefore, it is not possible to say whether our results prove the impact of the pandemic on this factor [16]. In a study conducted by in an Italian center, the results were

comparable to ours, with more than one-half of the patients being seen for a scheduled appointment and one-fifth having their appointments rescheduled [17]. In the present study, some patients mentioned that the intravenous administration of biological drug was postponed, as this procedure requires a 1-day hospitalization in Poland for formal reasons. This problem was also observed in another study [18].

Patients in the present study also reported having a problem with access to prescribed medications, most likely due to stock shortages and logistical difficulties, which could also affect the underlying disease. However, a survey conducted in 27 countries indicated that only 8.9% of the respondents had problems with the availability of essential medications [19]. However, that questionnaire had several limitations, such as a diverse group of patients and use of the vague term "essential medications". Due to the limited nature of the aforementioned study, as well as the limitations of our study, we cannot clearly indicate what these differences in drug availability result from.

Most of the patients in the present study had a mild to moderate SARS-CoV-2 infection and did not require hospitalization for this reason, despite the fact that the treatment used for IBD affects the immune system, modulates immunity, and can contribute to a higher risk of infection [20]. We speculate that this may be related to the fact that not every immunosuppressive treatment can cause clinical deterioration, because drugs exhibit different mechanisms of action. Other reports indicated that TNF-α is also overexpressed in SARS infection, so that biologic treatment with adalimumab (a monoclonal antibody anti-TNF-α) may paradoxically be a protective factor against severe COVID-19 [21-23]. Another study also indicated that biologic therapies can lessen the likelihood of adverse COVID-19 implications, such as cytokine storm syndrome [12]. Also, it has been reported that TNF inhibitors can be effective in reducing organ damage. This effect is achieved by the reduced excretion of the ectodomain of angiotensin-converting enzyme 2 (ACE2), which is essential for SARS-CoV-2 entry into the cell [24]. Studies reported that only long-term steroid use worsened clinical outcomes, and patients on steroidal treatment were more likely to be admitted to intensive care units [25]. In another study it was found that the use of either steroids or mesalazine was associated with a worse course of infection [13]. However, in our study, of the 15 patients using steroids, only 3 had COVID-19 and none of them required hospitalization. In view of these results, it seems reasonable to recommend to patients with IBD the same methods of prevention and treatment of COVID-19 as in the general population. In addition, only a minority of infected patients reported that the infection adversely affected the course of the underlying disease, with exacerbation of existing symptoms or appearance of new ones. This is consistent with the results of

other published studies [26,27]. In our results, only a small proportion of patients acquired SARS-CoV-2 infection, which agrees with the results of other studies that have been performed [24,28,29] and contradicts the concern that patients with IBD were at greater risk of being infected with SARS-CoV-2. Concerns have been raised in studies that found increased expression of the soluble form of ACE2 by which coronaviruses bind to target cells in the human body [28]. It is currently speculated that the soluble form of ACE2 does not anchor to the membrane and circulates in small amounts in the blood. Therefore, it may competitively capture SARS-CoV-2 and prevent the viral particle from binding to full-length ACE2, allowing it to enter the body and develop infection. However, further studies on a large group of patients with pharmacodynamic analysis of the effects of drugs used in IBD are needed to definitively verify and clarify this relationship.

Taking into consideration the course of COVID-19 disease in patients with IBD, most of our respondents did not require hospitalization and assessed the course of the disease as asymptomatic or mild. When comparing the older and younger groups in terms of the impact of COVID-19 on underlying disease, we noted that mainly older patients reported an exacerbation of existing symptoms of IBD, as well as the appearance of new ones, and were more likely to require hospitalization for this reason. Similar results were reported by Brenner et al [25].

Our survey also indicated that 59.25% (48/81) of patients had an online consultation instead of an in-person visit in a gastroenterology outpatient clinic. Online consultation and telemedicine have become the most common solutions, as was observed in other studies [18,24,28,30]. Telemedicine has many advantages, including access to the general practitioner from home, cost savings by not having to travel, and reduced risk of SARS-CoV-2 transmission by avoiding groups of people in the clinic. There are also limitations to telemedicine, primarily because the physician relying on the patient's interpretation of the problem and verbal communication from a distance is not always effective [30]. In patients with IBD, this is particularly important because they do not have access to physical, laboratory, or endoscopic examination when the consultation takes place online. However, it is worth mentioning that more than one-half of the patients in the present study positively evaluated this form of contact with a physician. Other studies also showed high trust, satisfaction, and good accessibility to telemedicine and its management of gastroenterological diseases, such as IBD, celiac disease, and HCV infection. This indicates a high probability of expanding this form of contact with the gastroenterological patient in the future [31,32]. According to our results, patient age had no influence on the use of telemedicine counseling. However, other studies have indicated that this form of contact has been chosen more frequently by younger patients [33,34].

Another issue we assessed in our study was the impact of the COVID-19 worldwide outbreak on the mental well-being of patients. Our results indicated that in more than one-half of patients surveyed the COVID-19 pandemic significantly and negatively affected the mental well-being of most patients. One-third of patients associated mental deterioration with the pandemic's negative impact on their control of the underlying disease. Other studies also confirmed the deterioration of mental status among patients with chronic diseases, especially those associated with immunosuppression, which is likely due to concerns about the severity and occurrence of complications of COVID-19 infection [35]. In addition, patients with other chronic diseases, such as asthma, diabetes, hypertension, and heart failure, were more likely to experience stress, anxiety and to develop depression than healthy control individuals [36,37]. Other studies indicated that social isolation increased negative emotions and psychological outcomes, including confusion, anger, anxiety, and depression [38-41]. In addition, prolonged exposure to loneliness is a critical risk factor for post-traumatic stress disorder symptoms [38]. A number of factors, including age, have also been shown to increase the likelihood of mental disorders; however, reports on this topic are conflicting, with some sources citing younger age as a risk factor, while other sources found that mental health problems are more prevalent among the elderly [39,42]. Other risk factors include female sex, education, occupation, economic conditions, and close contact with SARS-CoV-2-infected individuals [40,41].

Our results suggested that special emphasis should be placed on good contact between health professionals and patients with IBD during the COVID-19 pandemic to effectively guide treatment and prevent complications. This is crucial because, in most cases, continuation of current therapy and ongoing contact with a gastroenterologist helped to avoid relapse and unnecessary hospitalizations. In addition, psychological support should be provided to patients, as a change in mental status due to the pandemic situation can also worsen the course of the disease. We believe that further multicenter studies are needed to thoroughly evaluate the risk of COVID-19 in IBD patients and the efficacy and dangers of their immunomodulating drugs. This can significantly affect the milder course of infection and prevent exacerbations, hospitalizations, and mental state deterioration.

Our study had several limitations. The short follow-up period could have caused errors in estimating the long-term care of patients with IBD. Also, the relatively small study group did not represent an overall picture of patients with IBD in general, because their concerns, comorbidities, and additional treatments can affect the course of the underlying disease and that of COVID-19. Further, the small group of patients did not allow for a detailed assessment of the effectiveness of the medications used and their impact on the course of COVID-19. Finally,

the small number of included patients also means that the statistical analysis may not have identified significant findings with adequate sensitivity.

Conclusions

Based on the survey results, the main concerns of patients with IBD during the COVID-19 pandemic were difficulties in accessing medicine and gastroenterology clinics. Therefore, the data has shown that the healthcare system needs to be better prepared for extreme situations occurring in the world in order to provide long-term medical care for patients with IBD and other chronic diseases. In terms of mental health, most patients felt that the pandemic negatively affected their mental well-being and was associated with an exacerbation of their primary condition. Although patients completing the questionnaire may have had long-term use of drugs that affect the immune system, most respondents did not report having SARS-CoV-2 infection. Moreover, the course of COVID-19, in the opinion of patients with IBD, was assessed as mild or moderate, and in most cases, did not require hospitalization.

Declaration of Figures' Authenticity

All figures submitted have been created by the authors, who confirm that the images are original with no duplication and have not been previously published in whole or in part.

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