Psychological characteristics of patients with inflammatory bowel disease during the first wave of COVID-19

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Abstract

Introduction: Inflammatory bowel diseases (Crohn's disease (CD) and ulcerative colitis (UC)) are chronic, immune-mediated diseases with unclear aetiology, characterized by relapsing inflammation of the gastrointestinal tract. These conditions significantly impair patients' physical and mental condition and quality of life.

Aim: To investigate the impact of the current pandemic situation on inflammatory bowel disease (IBD) patients' psychological status and to determine factors that mediate the level of depression, anxiety, and health-related quality of life.

Material and methods: This was a multicentre, observational, cross-sectional, questionnaire-based study. A total of 206 participants (male: 34%) were involved. The online survey consisted of 8 different psychological measures (such as depression, anxiety, coronavirus distress, health-related quality of life, etc.) and other therapy-specific and sociodemographic factors.

Results: 28.2% of respondents showed depressive symptoms and 11.2% indicated moderate to severe anxiety. Also, 27.7% revealed mild, moderate, or severe distress regarding the coronavirus situation. According to regression analysis, anxiety and coronavirus distress are mostly influenced by psychological factors. In contrast, the changes in quality of life and depression can be explained by disease-specific and psychological factors as well.

Conclusions: Patients need more attention during this period to help them cope with psychological factors and prevent their IBD from becoming worse.

Introduction

Psychological aspects of inflammatory bowel diseases

Inflammatory bowel diseases (IBD; Crohn's disease (CD) and ulcerative colitis (UC)) are chronic, immune-mediated diseases with unclear aetiology, characterized by relapsing inflammation of the gastrointestinal tract. These conditions significantly impair patients' physical and mental condition and quality of life (QoL) [1, 2]. It has been reported that disease activity, relapses, corticosteroid treatments, and hospitalization rates are associated with lower health-related quality of life (HRQoL), while biological treatments increase it [3]. Patients often suffer from psychosocial disturbances such as anxiety and depression or further mental impairment during the active period of the disease. Byrne *et al.* found a 25.8% prevalence of depression and a 21.2% prevalence of anxiety among IBD patients, which was also associated with disease activity. In addition, CD patients showed higher anxiety and depression scores; however, no such difference was found in the latter study [4, 5]. According to Petruo *et al.*, CD and UC patients have different psychological impairments during relapses. They found that active IBD is associated with psychological distress and maladaptive cop-

ing (escape, rumination, avoidance) both in CD and UC [6]. Anxiety and depression are common comorbidities among patients with IBD, but mental impairment is not necessarily affected by disease activity [7]. In contrast, another study found evidence for bi-directional effect of IBD activity and psychological problems [8].

Psychological effects of the COVID-19

A Chinese study launched in January 2020 assessed the psychological condition of people during the pandemic. The study involved more than 52,000 participants, and 35% showed psychological distress. The results revealed that women experienced higher levels of distress than men [9]. Another Chinese study also examined the effect of COVID-19 on mental status, and the pandemic also proved to be a significant stressor in terms of people's psychological condition, such as depression, anxiety, and insomnia [10]. The pandemic has different psychological effects on every aspect of life and increases psychological burdens such as anxiety, depression, and COVID-19-specific phobia [11]. Van Mulukom et al. examined data from more than 8000 individuals in 79 countries, taking into account the psychological effects of pandemic threat and lockdowns during the first wave. Both anxiety and depression increased in the study sample as a result of the crisis, which was influenced by personal vulnerability as well as isolation [12]. Osváth draws attention to the psychological consequences of the pandemic. In addition to acute health problems, attention should also be paid to the longer-term effects of the pandemic. An increase in distress, and depressive and anxiety symptoms may also lead to an increased risk of suicide [13]. Even before the pandemic, relatively high levels of suicide risk of inflammatory bowel disease patients were obtained in our own study, with 5.3% of participants showing a high suicide risk [14]. Therefore, the analysis of the short- and long-term psychological effects of the pandemic is a priority. In addition to isolation, the reduction of interpersonal contacts, job restructuring, loss of employment, loss of income, fear of the consequences of the epidemic, and restrictions can lead to a number of negative psychological consequences. During the first wave of the pandemic, 36% of those surveyed worked from home. Maintaining family ties was a protective factor against the emotional effects of isolation resulting from the changed situation [15].

Psychological impact of COVID-19 on IBD patients

de Bock et al. found that the quality of life among patients with IBD was significantly lower regarding both physical and mental factors during the pandemic [16]. In an Australian study, moderate to severe depression, anxiety, and stress were also found to be around 30% among IBD patients, even without a previous psychiatric diagnosis [17]. Previous data highlighted that IBD patients show higher levels of anxiety – especially among female and highly educated patients – due to the covid crisis. IBD patients need more attention during the covid pandemic to reduce unexpected psychological effects [18]. Corticosteroid therapy and disease activity poses higher risk for infections in IBD [19]. An Italian prospective observational cohort study found that active IBD, older age, and other comorbidities were associated with unfavourable COVID-19 outcomes [20].

Pandemic situation in Hungary

The first confirmed case of covid infection was reported in Hungary on 4 March 2020, three months after the outbreak. In mid-March, the first national-level measures and restrictions were put in place in relation to the outbreak. The first wave occurred between 4 March and 17 July, with the highest number of infections recorded on 4 May (210 cases). The date of data collection therefore fell in the middle of the first wave. At that time, cluster infections were still prevalent, and the number of daily deaths did not rise towards 17 [21]. In the first wave totals, between 4 March and 24 July 2020, 4398 confirmed cases were identified and 3312 recovered; there were 490 active cases and 596 deaths. The impact of the epidemic has led to significant social and economic changes beyond the health risk [22].

Aim

The primary aim of this questionnaire-based study was to evaluate how the current pandemic situation affects Hungarian IBD patients' psychological status and which factors mediated the level of depression, anxiety, coronavirus concerns, and subjective health-related quality of life.

The secondary aim is to investigate the difference in anxiety, depression, and covid-specific distress between different groups (gender, disease type and activity, intestinal complications, intestinal symptoms).

The tertiary aim is to investigate the difference between anxiety, depression, and coronavirus distress in the 3 groups of drugs.

Material and methods
Participants and procedure

This was a Hungarian, multicentre, observational, cross-sectional, questionnaire-based study, carried out

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between May 2020 and mid-June 2020. Patients were enrolled from 3 different centres and through a patients' association. Participants were reached by e-mail, and the participation was voluntary.

Inclusion criteria were the following: age between 18 and 65 years, diagnosis of IBD within the previous 3 months according to international criteria, and a statement of consent. Exclusion criteria were age under 18 years, incapacitation, or being under guardianship. We excluded those who could not clearly determine the type of their disease and who belonged to the unclassified patient group and who had positive COVID-19 test results. Based on the survey ID, for those who completed the questionnaire more than once, the first completion was considered in each case.

After signing the statements of consent, the questionnaire was completed once by each participant, which took approximately 25 min. In the first part, they were asked about sociodemographic factors followed by information about the disease history, treatment (type of disease, method of treatment, year of diagnosis, surgery, medication, presence of complications, etc.), and a question about the presence of coronavirus infection at the time of the study. Disease activity was categorized as relapse or remission according to Physician Global Assessment criteria. Remission was categorized as the patient reporting no abdominal pain, bowel movements twice or less daily, no bleeding with bowel movements, and no weight loss [23]. The second part of the questionnaire covered depression (PHQ-9), feelings of hopelessness (short version of the Beck Hopelessness Scale), health-related quality of life (SIBDQ), coronavirus peritraumatic distress (CPDI), anxiety (BAI), perceived stress (PSS4), disease burden (IIRS), and perceived social support (MSPSS) issues. Four more questions were related to the exploration of possible psychiatric history.

Materials

The COVID-19 Peritraumatic Distress Index (CPDI) is a 24-item index designed to capture the frequency of specific phobias and stress disorders relevant to COVID-19. CPDI scores range from 0 to 100, and the higher the score, the greater the distress [9, 24]. The internal consistency of the measure is high (Cronbach's $\alpha = 0.92$). Thus, the test device has sufficient reliability for the construct to be tested.

The Perceived Stress Scale (PSS4) is a brief measure of stress perception. A higher score indicates higher risk for a clinical psychiatric disorder. We used the Hungarian version of PSS4 [25].

The Hungarian version of Beck Anxiety Inventory (BAI) is a self-reported scale to assess the intensity of physical and cognitive anxiety symptoms during the preceding week. Scores may range from 0 to 63 in 4 levels: minimal anxiety (0–7), mild anxiety (8–15), moderate anxiety (16–25), and severe anxiety (26–63) [26, 27].

The Illness Intrusiveness Ratings Scale (IIRS) consists of 13 self-reported items. The instrument assesses the QoL in people suffering from chronic diseases [28, 29].

The Patients Health Questionnaire-9 (PHQ-9) is a depression module of the self-administered version of the PRIME-MD diagnostic instrument. Based on the literature, a value of 10 or above is considered depression in the results [5]. The Hungarian version follows the original structure [30].

The Short Hungarian version of the Beck Hopelessness Scale is a 4-item self-reported measure to assess the level of negative expectations about the future – feelings about the future, loss of motivation, and future expectations. The total score is 12, and a higher score reflects a higher level of hopelessness [31].

The Short Inflammatory Bowel Disease Questionnaire (SIBDQ) is a self-reported instrument to assess quality of life in 4 different areas (bowel, systemic, social, emotional factors). A higher score indicates higher QoL [32].

The Hungarian version of the Multidimensional Scale of Perceived Social Support (MSPSS) is a 10-item self-reported questionnaire to access the perceived social support from 3 different sources: family, friends, and significant others [33].

Statistical analysis

Statistical tests were performed using SPSS software version 20 (SPSS Inc., Chicago, Illinois, USA), with $p < 0.05$ considered statistically significant. Linear regression was used to explore the effects of psychological factors for depression, anxiety, coronavirus distress, and quality of life in IBD. A backward method was used for the analysis. To avoid the confounding effects of the highly correlated variables in the analysis, we excluded the inappropriate independent variables (variance inflation factor – VIF > 3).

We used non-parametric tests to examine differences in responses to anxiety, depression, and COVID-19-specific stress between groups of independent variables such as gender, drug therapy, disease type and activity, complications, and extraintestinal manifestations (EIMs). Because of the high number of variations, 3 groups were formed for statistical analysis based on drug therapy (1: 5ASA treatment or steroid monotherapy or budesonide; 2: immunosuppressive therapy alone or in combination; 3: biological agent alone or in combination with other treatments).

Ethical considerations

Ethical approval for the study was obtained from the Ethics Committee of the Medical Research Council of Hungary (ETT) National Scientific and Ethical Committee (TUKEB) (IV/4447-2). The research was carried out according to the Code of Ethics of the World Medical Association (Declaration of Helsinki), and informed consent was obtained from the enrolled patients.

Results

A total of 206 patients participated in our questionnaire-based, cross-sectional study (male 34%). The average age was 40.11 ±11.43 years. The average disease duration was 11.16 ±8.29 years. A detailed description of demographic factors is provided in Table I.

Descriptive statistics of psychological questionnaires

In the depression questionnaire (PHQ-9) 2 divisions can be used. For values of 10 or above, it can be assumed that the respondent would achieve clinical-level depression. 58 (28.2%) participants had a score above 10. Furthermore, 26% of the patients already had suicidal ideation (≥ 1 point), and 3.9% had high risk (> 1). In total, 91.3% had a low risk of hopelessness and 8.7% had a high level of hopelessness. The Short Inflammatory Bowel Disease Questionnaire (SIBDQ) scoring was between 10 and 70 points. The mean score in our sample was 54.48 ±11.2 points (20–70). The Coronavirus Peritraumatic Distress Index (CPDI) scores showed 3 different categories. In total, 72.3% (149 patients) of the 206 patients belonged to the normal category, 23.8% (49 patients) of the patients belonged to the mild/moderate catagory, and 3.9% (8 patients) belonged to the severe distress category. According to the anxiety (BAI) there were 3 categories: mild (88.8%), moderate (6.8%), and severe (4.4%). The perceived stress (PSS4) mean score was 4.64 ±3.48 (0–16), and 89.8% of IBD patients scored less than 10 points. The Illness Intrusiveness Rating Scale (IIRS) mean score was 35.18 ±17.49. The Multidimensional Scale of Perceived Social Support mean score was 44.59 ±7.39. The average scores of the questionnaires are summarized in Table II.

Regression analysis of factors influencing psychological status

Depression
The dependent variable for the regression analysis of depression was the total PHQ-9 score. Independent variables were the following: presence of complications, marital status, place of residence, economic status, age, gender, disease duration, type of IBD, current disease

Table I. Demographic factors of the IBD patients (*N* = 206)

Sociodemographic characteristics	Frequencies	Valid percentage %
Gender:		
Male	70	34
Female	136	66
Education:		
Elementary school	4	1.9
High school	111	53.9
College or university studies	91	44.2
Marital status:		
Single	51	24.8
Lives with partner	155	75.2
Economic activity:		
Active	171	83
Inactive	35	17
Disease type:		
Crohn's disease	114	55.3
Ulcerative colitis	92	44.7
Disease activity:		
Remission	161	78.2
Relapse	45	21.8
Intestinal complication:		
None	113	54.8
Stenosis	50	24.3
Fistula	35	17
Both	8	3.9
Extraintestinal manifestation:		
Yes	106	51.5
No	100	48.5
Operation:		
Yes	81	39.3
No	125	60.7
Hospitalization within 1 year:		
Yes	48	23.3
No	158	76.7
Medication therapy:		
None, 5ASA, or steroid monotherapy	40	19.4
Immunosuppressive therapy	28	13.6
Biological therapy	138	67

IBD – inflammatory bowel disease, 5-ASA – 5-aminosalicilate.

Table II. Descriptive statistics of psychological questionnaires (*N* = 209)

Variable	PHQ-9	CPDI	BAI	SIBDQ	MSPSS	IIRS	PSS4	S-BHS
Mean	7.13	22.75	8.6	54.48	44.59	35.18	4.64	1.97
SD	5.49	13.12	10.19	11.19	7.39	17.49	3.48	2.77
Min.	0	4	0	20	12	13	0	0
Max.	23	68	49	70	50	91	16	12

BAI – Beck Anxiety Inventory, CPDI – Coronavirus Peritraumatic Distress Index, IIRS – Illness Intrusiveness Rating Scale, MSPSS – Multidimensional Perceived Social Support, PHQ-9 – Patient Health Questionnaire-9, PSS4 – Perceived Stress Scale 4-item version, S-BHS – short version of the Beck Hopelessness Scale, SD – Standard deviation, SIBDQ – Short Inflammatory Bowel Disease Questionnaire.

Table III. Regression model of factors explaining depression

Dependent variable: depression	B	β	*P*-value	VIF
Coronavirus peritraumatic distress	0.155	0.368	< 0.001***	1.715
Illness intrusiveness	0.105	0.336	< 0.001***	1.530
Hopelessness	0.642	0.324	< 0.001***	1.741
Age	−0.041	−0.085	0.024*	1.105
Living in the capital	1.028	0.069	0.065	1.096
Biological therapy	−0.731	−0.066	0.065	1.019

***p < 0.001, ** p < 0.01,*p < 0.05. VIF – variance inflation factor.

activity, previous surgery, stoma, hospital stay, drug therapy, and total scores from psychological questionnaires. Linear regression analysis for depression generated a 6-factor model with the following results: F (6197) = 99.914, $p < 0.001$, R^2 = 0.745. The results are presented in Table III.

Quality of life
The dependent variable was the total quality of life (SIBDQ) score. Independent variables were the same as previously listed. Regression analysis of QoL developed a 7-factor model with the following results: F (7196) = 71.337, $p < 0.001$, R^2 = 0.708. The results are presented in Table IV.

Anxiety
The independent variables were the same in this regression analysis as well. The regression analysis of

anxiety created a 4-factor model with the following results: F (4199) =133.299, $p < 0.001$, R^2 = 0.723. The results are presented in Table V.

Coronavirus-related distress
In this regression analysis, independent variables were the same. Regression analysis for coronavirus concerns developed a 2-factor model: F (2201) = 230.875, $p < 0.001$, R^2 = 0.694. The results are summarized in Table VI.

Results of non-parametric tests for gender and disease-specific factors
We examined differences between groups in terms of gender and disease-specific factors (drug therapy, intestinal complications, extraintestinal manifestations, disease activity, disease type). The results are shown in Table VII.

Table IV. Regression model of factors explaining quality of life

Dependent variable: quality of life	B	β	*P*-value	VIF
Illness intrusiveness	−0.290	−0.454	< 0.001***	1.555
Coronavirus peritraumatic distress	−0.224	−0.260	< 0.001***	1.801
Disease activity	5.172	0.190	< 0.001***	1.081
Extraintestinal manifestation	−3.031	−0.136	0.002**	1.128
Hopelessness	−0.533	−0.132	0.007**	1.659
Stoma	4.854	0.102	0.010*	1.064
Hospitalization	−1.885	−0.072	0.077	1.127

***p < 0.001, **p < 0.01,*p < 0.05. VIF – Variance Inflation Factor.

Table V. Regression model of factors explaining anxiety

Dependent variable: anxiety	B	β	*P*-value	VIF
Coronavirus peritraumatic distress	0.441	0.563	< 0.001***	1.974
Hopelessness	0.803	0.219	< 0.001***	1.732
Quality of Life	−0.170	−0.187	< 0.001***	1.847
Age	−0.070	−0.078	0.043*	1.072

***p < 0.001, **p < 0.01,*p < 0.05. VIF – Variance Inflation Factor.

Table VI. Regression model of factors explaining coronavirus peritraumatic distress

Dependent variable: Coronavirus Peritraumatic Distress Index	B	β	*P*-value	VIF
Anxiety	0.760	0.595	< 0.001***	2.259
Depression	0.688	0.291	< 0.001***	2.259

***p < 0.001, **p < 0.01, *p < 0.05. VIF – Variance Inflation Factor.

Table VII. Disease specific factors and gender: mean ranks

Variable	Anxiety		Depression		Coronavirus distress	
	Mean ranks	Test statistics	Mean ranks	Test statistics	Mean ranks	Test statistics
Drug therapy						
None, 5ASA or steroid monotherapy	108.09	*H*(2) = 0.300	107.16	*H*(2) = 0.327	110.81	*H*(2) = 0.816
Immunosuppressive therapy	101.73	*p* = 0.861	98.80	*p* = 0.849	104.41	*p* = 0.665
Biological therapy	102.53		103.39		101.20	
Intestinal complications:						
Absence	101.90	*U* = 5074.00	98.50	*U* = 4689.50	101.75	*U* = 5056.50
Presence	105.44	*p* = 0.671	109.58	*p* = 0.184	105.63	*p* = 0.642
Extraintestinal manifestations:	***		***		***	
Absence	87.66	*U* = 3716.00	83.46	*U* = 3295.50	83.63	*U* = 3313.00
Presence	118.44	*p* < 0.001	122.41	*p* < 0.001	122.25	*p* < 0.001
Disease activity:	**		**		*	
Remission	97.37	*U* = 2635.50	97.31	*U* = 2626.00	99.14	*U* = 2921.00
Relapse	125.43	*p* = 0.005	125.64	*p* = 0.005	119.09	*p* = 0.047
Disease type:						
UC	96.41	*U* = 4591.50	100.63	*U* = 4979.50	97.35	*U* = 4678.00
CD	109.22	*p* = 0.124	105.82	*p* = 0.533	108.46	*p* = 0.183
Gender:	***					
Women	115.72	*U* = 3098.00	115.10	*U* = 3182.00	116.45	*U* = 2999.00
Men	79.76	*p* < 0.001	80.96	*p* < 0.001	78.34	*p* < 0.001

***p < 0.001, **p < 0.01, *p < 0.05. 5-ASA – 5-aminosalicilate, CD – Crohn's disease, UC – ulcerative colitis.

Discussion

During the pandemic, increased attention should be paid to the psychological condition of young adults, because psychological distress makes anxiety, depression, and other disorders more common [34]. Our data collection was performed during the first wave of the pandemic. Our results suggest that patients' depression, anxiety, degree of coronavirus distress, and quality of life are both determined by psychological- and disease-specific factors, but to varying degrees. Psychological effects appear even without a proven infection. A relatively low percentage of the IBD patients suffer from mild/moderate or severe post-traumatic symptoms based on the coronavirus peritraumatic distress index (CPDI). The patient group is very special, and

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the pandemic shows great differences throughout the world; therefore, further studies are needed to develop the Hungarian standard of the CPDI questionnaire. Qiu *et al.* published a higher level of coronavirus distress (35%), and another study found even higher scores (61%) [9, 34]. The lower rate of coronavirus distress data we obtained, and the higher rate between the international ones, reflect the specifics of the study period. During the spring of 2020, the number of cases related to coronavirus in Hungary was even lower compared to the Chinese data [35]. Coronavirus-related distress in our sample is explained by psychological factors such as anxiety and depression. Anxiety and depression have the greatest effect on coronavirus distress levels. Wang *et al.* found similar results – anxiety and mood disorders were a significant difficulty for the IBD patients they studied, including those with confirmed infections [36]. In the case of IBD, high comorbidity with anxiety and depression was found, so their presence can significantly worsen the physical and mental condition, including the degree of specific distress associated with the pandemic situation [5, 37, 38]. According to a recent meta-analysis, a pandemic imposes significant psychosocial burdens on people. The pooled prevalence of anxiety was 33% and that of depression was 28% [39]. According to an Arabian study, more attention should be paid to IBD patients because their anxiety levels may increase during the pandemic [18].

Female gender, relapse, and the presence of any EIM showed higher distress values. According to this, active disease and other comorbidities have a significant effect on psychological responses to the current pandemic situation [20]. Another study found that COVID-19 concerns were higher among women with diabetes [40]. We were also able to show the results in the case of anxiety and depression, because these factors also appeared as explanatory factors in the regression analysis. The presence of EIM, female gender, and the effect of relapse on anxiety and depression have been shown previously [41, 42].

The level of anxiety is also affected by the current coronavirus situation, as well as changes in the extent of hopelessness. A negative change in these factors increases overall anxiety. A relatively low percentage of patients have moderate to high anxiety. Anxiety and depression, as well as hopelessness, go hand in hand in this pandemic as independent risk factors. Due to the uncertainty and unpredictability of the viral situation, isolation, and other limitations, it can develop and deepen psychological problems such as hopelessness. The degree of hopelessness is increased in patients treated for depression [31]. Inflammatory processes also have a bidirectional relationship with depression [8, 43, 44]; hence, intestinal inflammation can directly and indirectly modify these effects. Chronic illness is negatively affected by fears of the viral situation even in the absence of proven infection, thereby compromising the physical and mental health of patients. Besides the psychological factors, younger age and poorer quality of life also had a negative effect on anxiety levels. An earlier study found that anxiety is a significant predictor of quality of life in IBD [45]. According to our results, the reverse is also the case; a low level of quality of life is a significant predictor of higher levels of anxiety. Compared to the literature, the rate of anxiety was lower in our study than in international data (15.8%), which may be explained by the different course of the previously mentioned pandemic in a given period [34].

Nearly a quarter of the respondents showed depressive symptoms. Depression is frequent in IBD and more prevalent than in the general population [5], and perceived stress is also associated with depression in IBD [46]. A meta-analysis by Stapersma *et al.* reported 15% for depressive symptoms [47], but another article published higher rates, i.e. 21.6% [42]. During the first wave of the pandemic, researchers found a 27.1% incidence of depressive symptoms [34]. The factors that explain depression are also dominated by psychological factors: coronavirus distress, hopelessness, and the burden of the disease also appear. These were the main explanatory factors, all of which are expected to increase the level of depression. As mentioned earlier, hopelessness is more pronounced in the case of depression, so its appearance and its effect in the model can be attributed to this coexistence [31]. Those receiving biologic therapy showed lower levels of depression, but this effect was not significant. According to a previous study, biologic therapy was not associated with a higher risk of mood disorders [48]. In the case of health-related quality of life, we found mostly disease-specific explanatory factors such as disease activity, EIMs, wearing a stoma, and hospitalization in addition to the effects of hopelessness, illness intrusiveness, and coronavirus distress. In summary, quality of life is expected to improve from having a stoma and being in remission but EIMs and hospitalizations clearly impair that. EIMs have a significant effect on quality of life [49]. Multiple EIMs carry a risk of a more serious disease course, and worse quality of life and somatic status. Complaints can lead to more frequent use of healthcare, which can be hampered by restrictions and the burden on the healthcare system. Self-reported prevalence of EIMs is over 50% among patients, which may explain the significant effect in the regression model. Several studies have shown a reduced quality of life in the presence of EIMs, which confirms that the current uncertain situation affects patients,

and the fear from the virus may also appear through possible complications [50, 51]. Marinelli *et al.* found that active disease and the presence of EIMs influence the quality of life [52]. Our model indicates a better quality of life in remission. There was a decline in the level of HRQoL in IBD patients during the pandemic [16]. Disease activity significantly reduces the quality of life experienced in IBD, which is closely related to mental status and a significant indicator of disease outcome [2, 53]. Even before the pandemic, psychological factors had a significant impact on the disease, especially during flares. Worse mental condition has a negative impact on the course of the disease, and vice versa, which can be exacerbated by the current pandemic and place additional burdens on patients' lives.

There are several limitations of the study. Online completion of the survey can distort people's responses. There is also a more controlled procedure for the method of inclusion in the study, but with this convenience, the questionnaire reached more people per unit time. Increasing the test sample size could further improve the efficiency of the research. By supplementing the information on medication and therapy with the attitudes and laboratory parameters of the attending physician we could obtain even more accurate results, which we would like to achieve in later studies as well. No causal relationship can be revealed for the examined psychological factors. Finding an explanation for the relationship between these factors is the subject of further research, which is already underway. In addition to increasing the number of participants, optimising the distribution of gender, disease activity, and disease types could also contribute to more accurate results that could be extended to the population level. A cross-sectional study provides a snapshot of the data, which, combined with further follow-up data collection, could provide broader information on attitudes and changes in mental status of the patient group during the pandemic. The absence of a control group reduces comparability with the general population. The questionnaire took, on average, about 25 min to complete, during which time maintaining motivation can be challenging, especially when participants are asked to comment on the changing situation and illness that is taking place.

Conclusions

The psychological state of IBD patients during the pandemic period is significantly determined by the anxiety and depressive symptoms and the distress caused by the situation. QoL can be explained in a more complex way, and it is also significantly influenced by disease and therapy-specific factors. Therefore, monitoring the mental state of patients and introducing regular screening can become an important part of complex care to improve quality of life during a pandemic period and beyond.

Conflict of interest

The authors declare no conflict of interest.

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