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The psychological impact of inflammatory bowel disease as regards anxiety and depression: a single-center study

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Abstract

Background: Patients suffering from inflammatory bowel disease (IBD) are not systematically screened against depression as well as anxiety, although there are high prevalence and adverse influence on the quality of life. The aim of this work was to determine generalized anxiety disorder and major depressive disorder prevalence in patients with IBD, and the secondary objective was to identify patient properties linked to higher psychiatric disorder rates.

Results: We determined anxiety and depression prevalence in 105 IBD patients (82 having ulcerative colitis and 23 suffering from Crohn's disease) through a psychiatric interview using the Arabic version of Structured Clinical Interview for DSM IV Axis I diagnosis (SCID I), in addition to severity assessment of major depressive disorder and generalized anxiety disorder using the Hamilton Depression Scale (HAM-D) and the Hamilton Anxiety Scale (HAM-A), respectively. Patient data, disease characteristics, and drug information were also gathered. We found a high depression prevalence of 56.2% ($n = 59$), followed by 37.1% ($n = 39$), with no significant association between IBD severity and anxiety and depression severity.

Conclusion: Depression and/or anxiety affected a large number of IBD patients. Such psychiatric disorders' frequency would warrant detection as well as referral to psychiatric treatment.

Keywords: IBD, Depression, Anxiety

Background

Inflammatory bowel disease (IBD), involving ulcerative colitis and Crohn's disease, represents one of the debilitating chronic gastrointestinal diseases that has a significant adverse influence on the physical, psychological, family, and social dimensions of patients [1].

The prevalence of depression and anxiety in patients with chronic diseases in the general population is high, but they continue to receive insufficient treatment despite their significant adverse influences on the health and life quality of patients [2]. Depressive disorders are

linked to dysfunction in addition to morbidity and mortality increase in people having chronic diseases [3].

The psychological effects of IBD and its drug treatment occur in several IBD patients. In particular, anxiety can hold a remarkable influence on the life quality, comprising workability as well as family life [4].

Population-based research respectively found that the lifetime prevalence of anxiety and depression in IBD patients was 24.4 to 31.9% and 21.8 to 22.5%, respectively [5]. In a recent systematic review, the combined prevalence of anxiety and depression in IBD patients were 19.1% and 21.2%, respectively [6].

The mutual association between IBD as well as mental health issues has already been described and can be explained using the "brain-gut" axis. Such axis presents

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that intestinal inflammation existence can adversely affect mood, and conversely, anxiety and/or depression can exacerbate intestinal inflammation and mediate IBD relapse [7, 8].

Although most studies have only found statistical associations and cannot demonstrate a clear cause-effect relationship, the recent research suggests two-way interactions between depression and gastrointestinal inflammation. Currently, CD and UC are considered multifactorial diseases with complex pathogenesis that involves an abnormal immune response with a chronic pro-inflammatory state and a cytokine imbalance with a predominance of pro-inflammatory cytokines, including autoimmune phenomena and changes in anti-inflammatory pathways, interactions with the gut microbiota, and impaired brain-gut axis. The mechanisms that lead to depression development overlap with those that are central to IBD pathogenesis [9].

Treating depression and anxiety can enhance long-term results. Therefore, patients' identification at higher anxiety and depression risk is extremely vital to be treated appropriately.

IBD and mental health concerns impose a huge burden on their sufferers physically, mentally, and financially. To our knowledge, few studies have focused on the comorbidity of anxiety/depression in Egyptian IBD patients. Thus, the present study aimed to determine the prevalence of symptoms of anxiety/depression in the Egyptian IBD population and comprehensively analyze the impact of symptoms of anxiety/depression on IBD-related features.

The main objective of the current work was to determine generalized anxiety disorder and major depressive disorder prevalence in patients with IBD, who attended a gastroenterology outpatient clinic. The secondary objective was to identify patient properties linked to higher psychiatric disorder rates.

Methods

Study participants and sample size calculation

Study setting

IBD Study Group Clinic, Tropical Medicine Department, Ain Shams University Hospitals.

Study period

(3 months) From October 2020 till the end of December 2020.

Sample size

Using Epi Info 7 program for sample size calculation and according to previous literature, we assume a 25% prevalence of depression or anxiety among IBD patients. Setting margin of error at 10% and confidence level

at 95%, the sample size of 75 patients will be needed at minimum.

Our study comprised 105 patients with IBD and fulfilled the inclusion and exclusion criteria, presented at the IBD Study Group Clinic, Department of Tropical Medicine, Ain Shams University Hospitals. IBD was diagnosed using conventional criteria of the disease. All IBD patients met the standard criteria for CD or UC, which is based on a combination of clinical, biochemical, stool, endoscopic, cross-sectional imaging, and histological investigations. The diagnosis of CD and UC was based on the third European Evidence-based Consensus on Diagnosis and Management of Crohn's disease and ulcerative colitis [10].

Exclusion criteria

1. Disease duration of more than 3 years
2. Patients with a past history of other psychiatric disorders
3. Some serious chronic conditions, such as chronic heart failure and chronic obstructive pulmonary disease, as well as other immunological disorders and cancer
4. Pregnancy

All patients with IBD who visited the outpatient clinic and fulfilled the criteria were interviewed by a consultant psychiatrist.

Study design

This clinical study exhibited observational as well as cross-sectional features. IBD patients were subjected to provide demographic and social data. Through validated clinical questionnaires as well as scoring systems, depression and anxiety assessments were accomplished. Our study got approval from the Medical Ethics Review Committee of the Faculty of Medicine at Ain Shams University, Egypt.

Study procedures

All patients visiting the clinic and fulfilled the criteria have been evaluated by a consultant psychiatrist using Structured Clinical Interview for DSM IV Axis I Diagnosis (SCID I) [11] using the Arabic version [12] for the current existence of major depressive disorder or generalized anxiety disorder. A severity assessment of depression and anxiety in patients was carried out utilizing the Hamilton Depression Scale (HAM-D) [13] and the Hamilton Anxiety Scale (HAM-A) [14]. The severity of IBD was assessed for all patients using Crohn's Disease Activity Index (CDAI) for Crohn's disease and Mayo score for ulcerative colitis.

SCID I [11] is a structured interview conducted by a clinician to be used in undergoing psychopathological evaluation of psychiatric patients or non-patient subjects. SCID I development was to afford coverage for psychiatric diagnoses following DSM IV and was rationally designed to exhibit more efficiency and be utilized easily over other existing tools. Therefore, it takes less time to train and manage, reaching about 30 min to be applied.

The HAM-D [13] scale is possibly the most widely used rating scale for depressive symptoms. Despite the original scale consisted of 21 items, Hamilton proposed that only the first 17 items were rated. The other four items were rare (for example, depersonalization), or other aspects of the condition were described rather than severity (for example, daily variation). So, we applied the 17-item scale. For HAM-D17, a score of 0 to 7 is generally believed to be within the normal range (or in clinical remission), while a score of 20 or more (indicating at least a moderate degree of severity) is generally accepted for entering a clinical trial. It takes about 30 min to apply the HAM-D.

The HAM-A [14] scale was one of the first rating scales established for measuring anxiety symptoms' severity and is commonly utilized in clinical and research settings to date. This scale comprises 14 items, each represented by a set of symptoms, and can measure mental anxiety (excitement and mental anguish) and somatic anxiety (physical symptoms associated with anxiety).

Crohn's Disease Activity Index (CDAI) is the gold standard to measure disease activity for Crohn's disease (CD) research. The CDAI is computed using laboratory data, physical exam findings, and self-reported CD symptoms for each of the prior 7 days. Scores < 150 define remission, 150–219 mild activity, 220–450 moderate activity, and > 450 severe activity [15].

The most commonly used index for studies of the efficacy of ulcerative colitis (UC) therapy is the 12-point Mayo score. This composite index includes patient-reported estimates of stool frequency and bleeding, endoscopic assessment of mucosal inflammation, and the physician's global assessment of disease activity. The 6-point Mayo score uses only the number of bowel movements above average and the bleeding components of the full Mayo score. Scores above 1.5 are indicative of active disease [16].

Statistical analysis

The obtained data were processed, coded, tabulated, and entered in a PC with the Statistical Package for Social Sciences (SPSS 25). After data presentation, the appropriate analysis was performed based on the data type collected for each parameter.

Descriptive statistics

1. Mean, standard deviation ($\pm SD$), and range for parametric numerical data, while median and interquartile range (*IQR*) for non-parametric numerical data
2. Frequency and percentage of non-numerical data

Analytical statistics

1. The Student *t*-test was utilized for statistical assessment of the significance difference between means of two study groups.
2. The chi-square test was employed for examining the correlation between two qualitative variables.
3. Fisher's exact test was deployed for examining the association between two qualitative variables if the anticipated count is < 5 in more than 20% of cells.
4. Correlation analysis (Pearson's method) was utilized for assessing the association strength between two quantitative variables. The correlation coefficient "*r*" defines the strength (magnitude) as well as direction (positive or negative) of a linear relationship between two variables.

- $r = 0-0.19$ is considered as a very weak correlation
 - $r = 0.2-0.39$ as weak correlation
 - $r = 0.40-0.59$ as moderate correlation
 - $r = 0.6-0.79$ as strong correlation
 - $r = 0.8-1$ as very strong correlation
- p*-value: level of significance
 $-p > 0.05$: non-significant (NS)- $p < 0.05$: significant (S)- $p < 0.01$: highly significant (HS)

Results

Features of the patient's population

The total number of patients with IBD involved was 105, females (54%) and males (46%) having 33.2 years a mean age, single (approximately 51%), and urban residents (73.3%). Of 105 patients with IBD, 82 exhibited UC and 23 held Crohn's disease. For evaluating IBD activity in our patients, we calculated the Mayo score and Crohn's Disease Activity Index (CDAI), providing a mean Mayo score of approximately 8.4 and a mean CDAI of about 238.4 as shown in Table 1.

Prevalence of major depressive disorder and generalized anxiety disorder in patients with IBD

We revealed that 59 patients (56.2%) had major depressive disorder alone (20 patients versus 19.1% of all patients) or

Table 1 Characteristics of the patient population

		Mean/N	SD/%	Median (IQR)	Range
Age		33.2	11.0	32 (25–40)	(12–76)
Sex	Female	56	53.3%		
	Male	49	46.7%		
Residency	Urban	77	73.3%		
	Rural	28	26.7%		
Marital status	Single	53	50.5%		
	Married	48	45.7%		
	Divorced	4	3.8%		
IBD	UC	82	78.1%		
	Crohn's	23	21.9%		
Mayo score UC (N = 82)		8.4	2.6	8 (7–10)	(4–12)
CDAI (N = 23)		238.84	62.29	251 (180–275)	(159–413)

IQR interquartile range; SD standard deviation; CDAI Crohn's Disease Activity Index; Mayo score is an index for the severity of ulcerative colitis

both depression and anxiety (39 patients, 37.1%). HAM-D ranged between 8 and 29 with a mean of 16.4, while HAM-A ranged between 10 and 50 with a mean of 19.5 as shown in Table 2. We noticed that all anxiety patients (39 patients, 37.1%) had depression, while 20 patients (19.1% of all patients) had only depression as shown in Table 3.

Comparison between the group of those with depression and those without as regards socio-demographic data and disease characteristics

The study revealed a significant age difference between the group of those with depression and those without depression since the group with depression was older than the group without depression (*p*-value = 0.034). No significant changes were reported regarding the two groups regarding gender, residence, and marital status. Besides, no significant changes in depression prevalence were present between the two IBD types as seen in Table 4.

Comparison between the group of those with anxiety and those without as regards socio-demographic data and characteristics of the disease

No significant changes have been found between the group of patients with and without anxiety regarding age,

gender, place of residence, and marital status. Besides, we stated no significant differences between ulcerative colitis as well as Crohn's disease in anxiety disorder percentage as shown in Table 5.

Correlations between the severity of IBD and the severity of depression and anxiety disorders

We found neither correlation between the total score of HAM-D and the total Mayo score for UC or the CDAI score for Crohn's disease, nor a correlation between the total score of HAM-A and the total Mayo score for UC or the CDAI score for Crohn's disease as illustrated in Table 6.

Different types of treatment received by the patients are demonstrated in Table 7

Relation between different types of treatment received by the patients and the presence of depression and anxiety

We found no significant relation between different types of treatment and the presence of major depressive disorder (Table 8).

As regards generalized anxiety disorder, we found only significant relation between azathioprine treatment and the presence of generalized anxiety disorder as we found

Table 2 The prevalence of major depressive disorder and generalized anxiety disorder

		Mean/N	SD/%	Median (IQR)	Range
Major depressive disorder	No	46	43.8%		
	Yes	59	56.2%		
Generalized anxiety disorder	No	66	62.9%		
	Yes	39	37.1%		
Hamilton Depression Score (N = 59)		16.4	5.8	14 (12–22)	(8–29)
Hamilton Anxiety Score (N = 39)		19.5	9.5	17 (13–22)	(10–50)

IQR interquartile range; SD standard deviation

Table 3 Comorbidity between major depressive disorder and generalized anxiety disorder

		Major depressive disorder		Chi-square test		
		No (N = 46)	Yes (N = 59)	χ ²	p-value	Sig.
		N (%) Mean ± SD	N (%) Mean ± SD			
Generalized anxiety disorder	No	46 (100%)	20 (33.9%)	48.374	< 0.001 ^a	S
	Yes	0 (0%)	39 (66.1%)			
Hamilton Depression Score			16.41 ± 5.8			
Hamilton Anxiety Score			19.49 ± 9.53			

^a Chi-square test of significance; χ², chi-square test value

a high prevalence of anxiety in patients receiving azathioprine treatment (p-value = 0.032) (Table 9).

Discussion

A close relationship and two-way communication are present between the brain and the gut, occurring continuously through the brain-gut axis (BGA). BGA is an indirect communication and offers a biological construct to support the biopsychosocial concept of gastrointestinal diseases [17]. Psychiatric disorders often occur in gastrointestinal diseases and vice versa [18].

Many reported works have recently studied the connection between IBD and psychological disorders [19, 20] and have compared the extent of anxiety and depression between subtypes of IBD [21, 22]. Nevertheless, the IBD

relationship with psychiatric illness (depression or anxiety) exhibited inconsistency even in a recently reported meta-analysis with eight studies [23]. The results' heterogeneity was too high without subsequent analysis of the reason.

IBD is a chronic disorder that makes its patients more likely to experience anxiety than the overall population [24]. Depression and anxiety are much more frequent than expected in IBD patients, especially those with CD. UC patients are also more likely to experience anxiety disorders than the general population or patients who are suffering from other chronic disease types [25].

Our study revealed a high depression prevalence (56.2%) and a high anxiety prevalence (37.1%) in our sample. Our findings match those of patients with long-term health problems that generally have an increased risk of

Table 4 Multivariable logistic regression analysis of the relationship between patient demographic and disease characteristics and the existence of major depressive disorder

		Major depressive disorder		OR (CI 95%)	Test of significance		
		No (N = 46)	Yes (N = 59)		Value	p-value	Sig.
		Mean ± SD N (%)	Mean ± SD N (%)				
Age		30.61 ± 8.72	35.19 ± 12.2		t = -2.152	0.034 ^T	S
Sex	Female	21 (45.65%)	35 (59.32%)	0.58 (0.26–1.26)	χ ² = 1.941	0.164 ^C	NS
	Male	25 (54.35%)	24 (40.68%)				
Residency	Urban	34 (73.91%)	43 (72.88%)	1.05 (0.44–2.53)	χ ² = 0.014	0.906 ^C	NS
	Rural	12 (26.09%)	16 (27.12%)				
Marital status	Single	26 (56.52%)	27 (45.76%)	Ref.		0.565 ^F	NS
	Married	19 (41.3%)	29 (49.15%)				
	Divorced	1 (2.17%)	3 (5.08%)				
IBD	UC	37 (80.43%)	45 (76.27%)	1.28 (0.5–3.29)	χ ² = 0.262	0.609 ^C	NS
	Crohn's	9 (19.57%)	14 (23.73%)				
Mayo Score UC (N = 37, 45)		8.03 ± 2.48	8.69 ± 2.64		t = -1.162	0.249 ^T	NS
CDAI (N = 9, 14)		238.93 ± 78.56	238.79 ± 52.62		t = 0.005	0.996 ^T	NS

^T Student t-test of significance; t, Student t-test value

^C Chi-square test of significance; χ², chi-square test value

^F Monte-Carlo Fisher's exact test of significance

Table 5 Multivariate logistic regression analysis of the relationship between demographic and pathological characteristics of patients and existence of generalized anxiety disorder

		Generalized anxiety disorder		OR (CI 95%)	Test of significance		
		No (N = 66)	Yes (N = 39)		Value	p-value	Sig.
		Mean ± SD N (%)	Mean ± SD N (%)				
Age		32.89 ± 11.42	33.67 ± 10.39		<i>t</i> = -0.346	0.730 ^T	NS
Sex	Female	31 (46.97%)	25 (64.1%)	0.5 (0.22–1.12)	<i>X</i> ² = 2.891	0.089 ^C	NS
	Male	35 (53.03%)	14 (35.9%)				
Residency	Urban	47 (71.21%)	30 (76.92%)	0.74 (0.3–1.85)	<i>X</i> ² = 0.409	0.523 ^C	NS
	Rural	19 (28.79%)	9 (23.08%)				
Marital status	Single	34 (51.52%)	19 (48.72%)	Ref.		0.826 ^F	NS
	Married	30 (45.45%)	18 (46.15%)				
	Divorced	2 (3.03%)	2 (5.13%)				
IBD	UC	52 (78.79%)	30 (76.92%)	1.11 (0.43–2.88)	<i>X</i> ² = 0.05	0.823 ^C	NS
	Crohn's	14 (21.21%)	9 (23.08%)				
Mayo score UC (N = 52, 30)		8.19 ± 2.48	8.73 ± 2.73		<i>t</i> = -0.917	0.362 ^T	NS
CDAI (N = 14, 9)		246.53 ± 71.71	226.89 ± 45.3		<i>t</i> = 0.730	0.473 ^T	NS

^T Student *t*-test of significance; *t*, Student *t*-test value

^C Chi-square test of significance; *X*², chi-square test value

^F Monte-Carlo Fisher's exact test of significance

major depression [26]. The results were also consistent with other works, indicating that anxiety and depression prevalence in IBD patients exhibited a high level compared to the control group [27].

Byrne et al. noticed that the prevalence of anxiety and depression in patients with IBD (21.2% and 25.8%, respectively) is over that of the general Canadian population. Besides, Thomson and Sulman found more than 25% of people with IBD experienced depression at some point in their lives, while anxiety can affect more than 30% [28].

In patients with IBD, the anxiety rate during remission periods has been estimated to be 29 to 35% and in relapses up to 80% [29]. A Dutch study of 231 patients suffering from IBD found that up to 43% exhibited a higher anxiety level, indicating a psychiatric disorder, and those anxiety symptoms, in addition to psychiatric complaints, are not adequately treated [30].

The rate of differences in depression and anxiety presented in various studies is possible because of variation in the populations under study and the employed methods for depression and anxiety assessment, in addition to the period during which both depression and/or anxiety were evaluated [31].

Regarding the socio-demographic characteristics, we found a significant association between depression and age since depression was more common in older patients, while we did not find differences in terms of sex or marital status.

Like our results, older age was speculated as a risk factor. In a study of Korean origin inactive IBD patients with mood disorders, 40 years of age or older was regarded as an independent indicator of the low life quality [32].

The gender of females as a risk factor in patients with IBD for psychological disorders is controversial. Similar

Table 6 Correlation between the total score of HAM-D and HAM-A with Mayo score of UC and CDAI score of Crohn's disease

		Mayo score UC (N = 45)	CDAI (N = 14)
		Hamilton Depression Score	Pearson correlation
	<i>p</i> -value	0.393	0.657
	Sig.	NS	NS
		Mayo score UC (N = 30)	CDAI (N = 9)
Hamilton Anxiety Score	Pearson correlation	-0.038	0.287
	<i>p</i> -value	0.841	0.455
	Sig.	NS	NS

CDAI Crohn's Disease Activity Index; Mayo score is an index for the severity of ulcerative colitis

Table 7 Different types of treatment received by patients

Type of treatment		N	%
Oral mesalamine	No	31	29.5%
	Yes	74	70.5%
Topical mesalamine	No	101	96.2%
	Yes	4	3.8%
Oral steroids	No	69	65.7%
	Yes	36	34.3%
Topical steroids	No	103	98.1%
	Yes	2	1.9%
Azathioprine	No	35	33.3%
	Yes	70	66.7%
Biological therapy	No	84	80.0%
	Yes	21	20.0%
Surgical intervention	No	98	93.3%
	Yes	7	6.7%

to our results, Nahon et al. found no female predominance in anxious IBD patients [29]. In contrast to our results, females were linked to increased anxiety risk, as reported in various studies of IBD patients and the general population [33]. Female patients are also more prone to depression in several studies [27, 33].

In terms of anxiety and depression prevalence, we found no distinction among UC and CD patients, which agrees with previous studies [34]. On the contrary, Neundorff et al. found disease type impact with a higher prevalence rate of depressive symptoms in patients with CD than in patients with UC [35].

There was no correlation between both the severity of depression and anxiety and the severity of IBD, either ulcerative colitis or Crohn’s disease. Although we have not found any studies that directly correlate the severity of psychiatric disorders and IBD, we found indirect relationships that reflect the negative effect of IBD severity on anxiety or depression severity. For instance, Nahon et al. and Häuser et al. noticed that IBD activity exhibited a significant association with an increased risk for depression and anxiety in IBD patients [29, 36].

IBD activity is also strongly related to psychological symptoms, as more anxiety symptoms were also seen in flaring periods of patients with IBD [28]. A study in patients with UC stated that endoscopically confirmed active mucosal inflammation was linked to increased psychological stress [37]. Indirectly, patients requiring immunomodulatory and biological therapy for IBD treatment were also at augmented risk of comorbid anxiety and depression associated with the severity of IBD disease [38].

Table 8 Multivariable logistic regression analysis of the relationship between treatment types received by the patient and major depressive disorder

		Major depressive disorder		OR (CI 95%)	Test of significance		
		No (N = 46)	Yes (N = 59)		Value	p-value	Sig.
		N (%)	N (%)				
Oral mesalamine	No	14 (30.43%)	17 (28.81%)	1.08 (0.47–2.51)	$\chi^2 = 0.033$	0.857 ^C	NS
	Yes	32 (69.57%)	42 (71.19%)				
Topical mesalamine	No	44 (95.65%)	57 (96.61%)	0.77 (0.11–5.7)		1.00 ^F	NS
	Yes	2 (4.35%)	2 (3.39%)				
Oral steroids	No	28 (60.87%)	41 (69.49%)	0.68 (0.3–1.54)	$\chi^2 = 0.853$	0.356 ^C	NS
	Yes	18 (39.13%)	18 (30.51%)				
Topical steroids	No	44 (95.65%)	59 (100%)			0.19 ^F	NS
	Yes	2 (4.35%)	0 (0%)				
Azathioprine	No	16 (34.78%)	19 (32.2%)	1.12 (0.5–2.54)	$\chi^2 = 0.077$	0.781 ^C	NS
	Yes	30 (65.22%)	40 (67.8%)				
Biological therapy	No	37 (80.43%)	47 (79.66%)	1.05 (0.4–2.76)	$\chi^2 = 0.01$	0.922 ^C	NS
	Yes	9 (19.57%)	12 (20.34%)				
Type remicade 1–Humera 2	No	40 (86.96%)	51 (86.44%)	1.05 (0.34–3.26)	$\chi^2 = 0.006$	0.939 ^C	NS
	Yes	6 (13.04%)	8 (13.56%)				
Surgical intervention	No	43 (93.48%)	55 (93.22%)	1.04 (0.22–4.91)		1.00 ^F	NS
	Yes	3 (6.52%)	4 (6.78%)				
Did you stop TTT?	No	40 (86.96%)	54 (91.53%)	0.62 (0.18–2.17)		0.529 ^F	NS
	Yes	6 (13.04%)	5 (8.47%)				

^C Chi-square test of significance (χ^2 , chi-square test value). ^F Monte-Carlo Fisher’s exact test of significance

Table 9 Multivariate logistic regression analysis of the relationship between treatments received by the patient and generalized anxiety disorder

		Generalized anxiety disorder		OR (CI 95%)	Test of significance		
		No (N = 66)	Yes (N = 39)		Value	p-value	Sig.
		N (%)	N (%)				
Oral mesalamine	No	18 (27.27%)	13 (33.33%)	0.75 (0.32–1.77)	$\chi^2 = 0.433$	0.511 ^C	NS
	Yes	48 (72.73%)	26 (66.67%)				
Topical mesalamine	No	63 (95.45%)	38 (97.44%)	0.55 (0.06–5.51)		1.00 ^F	NS
	Yes	3 (4.55%)	1 (2.56%)				
Oral steroids	No	43 (65.15%)	26 (66.67%)	0.94 (0.41–2.16)	$\chi^2 = 0.025$	0.874 ^C	NS
	Yes	23 (34.85%)	13 (33.33%)				
Topical steroids	No	64 (96.97%)	39 (100%)			0.529 ^F	NS
	Yes	2 (3.03%)	0 (0%)				
Azathioprine	No	27 (40.91%)	8 (20.51%)	2.68 (1.07–6.73)	$\chi^2 = 4.589$	0.032 ^C	S
	Yes	39 (59.09%)	31 (79.49%)				
Biological therapy	No	55 (83.33%)	29 (74.36%)	1.72 (0.66–4.54)	$\chi^2 = 1.234$	0.267 ^C	NS
	Yes	11 (16.67%)	10 (25.64%)				
Type remicade 1–Humera 2	No	59 (89.39%)	32 (82.05%)	1.84 (0.59–5.72)	$\chi^2 = 1.144$	0.285 ^C	NS
	Yes	7 (10.61%)	7 (17.95%)				
Surgical intervention	No	61 (92.42%)	37 (94.87%)	0.66 (0.12–3.57)		1.00 ^F	NS
	Yes	5 (7.58%)	2 (5.13%)				

^C Chi-square test of significance (χ^2 , chi-square test value). ^F Monte-Carlo Fisher's exact test of significance

Psychiatric comorbidities can be successfully treated in chronic inflammatory diseases [39], and this may provide improved results in individuals with IBD. Until now, depression and anxiety disorders in people with IBD are not recognized and are not adequately treated. One study estimated that of 43% of people with depression or anxiety symptoms, only 18% received psychological treatment and 21% took psychotropic drugs [30].

Anxiety and depression were considered to have a direct impact on health-related quality of life (HR-QOL) in people with IBD, regardless of disease activity [40]. Zhang et al. investigated depression and disease severity role as individual factors to predict the life quality [41]. Besides, psychiatric disorders of patients with IBD can anticipate costly results, comprising emergency room visits and IBD-related hospitalizations, in addition to high treatment costs [42]. The possible advantages of treatment for mental health, as well as a higher prevalence of depression and anxiety in IBD patients, suggest that screening for depression and anxiety in such a population may be helpful. The brain-gut axis pathophysiology may hold a significant function in IBD, in addition to inflammation and psychological symptoms. TNF-alpha, a pro-inflammatory cytokine, was defined as a key factor. Additional efforts in such areas could showcase future therapeutic

targets towards IBD and improve psychological symptoms [43].

As identified herein, the high prevalence of mental disorders represents a major issue, requiring particular concern. Since psychiatric disorders have a significant impact on disease progression, relapse rates, treatment outcomes, and life quality, it is important to foster collaboration between gastroenterologists and psychiatrists. Detection of psychiatric disorders in patients with CD and UC should be part of the medical approach to IBD. Achievement of psychological remission and remission of somatic symptoms appears to be a promising result in IBD treatment [44].

Conclusions

The prevalence of depression and anxiety in patients with chronic diseases in the general population is high. The patients continue to receive insufficient treatment despite their significant adverse influences on the health and life quality of patients. Our study demonstrated that more than half of IBD patients suffered from major depressive disorder, generalized anxiety disorder, or both. This high prevalence of depression and/or anxiety warrants psychiatric screening and referral in clinics that serve this population. Clinicians should be aware that these psychiatric disorders can occur as a result of IBD. Consequently, a collaborative approach is required to ensure therapy optimization for IBD patients.

Abbreviations

BGA: Brain-gut axis; CD: Crohn's disease; CDAI: Crohn's Disease Activity Index; DSM IV: Diagnostic and Statistical Manual IV; HAM-A: Hamilton Scale for Anxiety; HAM-D: Hamilton Scale for Depression; HR-QOL: Health-related quality of life; IBD: Inflammatory bowel disease; IQR: Interquartile range; SCID I: Structured Clinical Interview for DSM IV axis I disorders; SPSS: Statistical Package for the Social Science; UC: Ulcerative colitis.

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Authors' contributions

S.A, H. R, and O. A. designed the research; S. A, M. E., W.A., and O. A. performed the research; M. A. and S. K. contributed analytic tools; M. A. and A. F. analyzed the data; S. A. and O. A. wrote the paper. All authors read and approved the final manuscript.

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Availability of data and materials

The data underlying this article will be shared on reasonable request to the corresponding author.

Declarations

Ethics approval and consent to participate

The nature of the study was discussed with each patient, and written informed consent was obtained from all parents before participating in the study. This study was approved by Ain Shams University Hospital Ethics Committee after a very clear statement that provided information on the following points: study rationale; participation in this study was completely free and voluntary; participation in the study had no direct benefit to him, although the data obtained could be used for the benefit of other patients; they may be withdrawn at any time without giving any justification and without affecting their care service; and the results of the study may be used for scientific publication but the identities of the patients would be completely secret.

The committee's reference number is R 107/ 2021.

Consent for publication

"Not applicable".

Competing interests

The authors declare that they have no competing interests.

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