Psychological impairment in inflammatory bowel diseases: the key role of coping and defense mechanisms

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ABSTRACT

A comprehensive investigation of psychological features in chronic patients is very important for tailoring effective treatments. In this study we tested anxiety, depression, health related quality of life (HR-QoL), alexithymia, coping styles, and defense mechanisms, in eighty-four patients with Crohn disease (CD) and ulcerative colitis (UC). Participants reported low to moderate HR-QoL and anxiety, apart from alexithymia. Women experienced lower QoL and higher levels of anxiety and depressive symptoms. Coping and defense strategies were related to distress symptoms and QoL. Positive attitude and principalization, showed negative associations with depression, anxiety and alexithymia and were also found to be associated with mental health. CD patients used significantly more turning against objects (p=0.02) and projections (p=0.01) and UC patients used more reversal (p=0.04). Elderly women showed higher anxiety symptoms and lower perceived QoL. Multiple regression analysis revealed anxiety and depression were independently associated with QoL. Significant differences emerged in defense styles among CD and UC. CD participants used more maladaptive coping and defense styles which were related to mental distress, depression and anxiety, together with higher level of alexithymia. Findings suggest that psychological aspects play a key role in mental health in patients suffering from inflammatory bowel diseases. A multi-integrated clinical strategy including psychotherapeutic interventions should be considered in treating CD and UC.

Key words: inflammatory bowel diseases, alexithymia, HR-QoL, coping and defense mechanisms, treatment.

Introduction

The study of individual psychological aspects in the treatment of chronic diseases is acquiring ever greater importance in recent years. Psychotherapy research has widely demonstrated how person-centered psychological interventions can significantly improve patients' mental health and their QoL (Boggatz, 2020; Boldrini *et al*., 2020; Lingiardi *et al*., 2010). The inflammatory bowel diseases (IBDs) represent a group of non-infectious, chronic, relapsing disorders of the gastrointestinal tract of unknown etiology, driven by an inappropriate immune response in genetically susceptible hosts. Primarily, IBDs include Crohn's disease (CD) and ulcerative colitis (UC). The prevalence of IBDs increased substantially from 1990 to 2017, not only in the

high-income nations, but also in the more recently developed areas such as South America, Eastern Europe, Asia, and Africa. Overall, IBDs affect more than 6.8 million people worldwide, representing a serious medical, psychological and social burden due to patient's debilitating physical and psychological symptoms impacting daily life, also with loss of schooling and absenteeism and relevant health-care costs (GBD 2017 Inflammatory Bowel Disease Collaborators, 2020). It is well known that psychological features are commonly encountered in chronic diseases, including IBDs (Porcelli *et al*., 2014; Galli *et al*., 2019; Conversano *et al*., 2020; Martino *et al*., 2020) and they may contribute to perceived health-related quality of life (HR-QoL). Recently, a systematic review including 30,118 patients with IBDs, showed that the prevalence of anxiety symptoms was 32.1% and the prevalence of depression symptoms was 25.2%. Particularly, CD patients have a 20% increased risk of suffering from anxiety and depressive symptoms in comparison with UC patients. A gender difference has been also highlighted regarding the prevalence of psychological symptoms in IBD. Mainly, anxiety and depressive symptoms are present in 33.8% and 21.2% of cases in women, respectively, and in 22.8% and 16.2% of men, respectively. An active disease was also associated with a 2-to-3-fold increased risk of anxiety and depressive symptoms (Barberio *et al*., 2021).

It is widely recognized UC mainly affects colon and rectum, while CD Crohn's disease may involve the entire intestine, from mouth to anus (Bouwman *et al*., 2022; Li *et al*., 2022). It is often difficult to formulate a differential diagnosis, remaining this goal crucial for the appropriate treatment and management of these two pathologies (Bouwman *et al*., 2022). IBDs inspired high quality research from all the world to deeply understand their underlying etiopathogenesis, course and outcome of such diseases. Empirical evidence has been provided on the common pathophysiologic mechanism between clinical psychological factors and IBDs (Mawdsley *et al*., 2005; Li *et al*., 2022). Moreover, psychological resources have been proved to predict the onset, maintenance, recurrence, and outcome (Triantafillidis *et al*., 2013). From this integrated perspective, and following the brain-gut axis, IBD's pathophysiology rises the inflammatory brain reaction, leading to psychological behavioral comorbidities, fully configuring the link between psychological distress and IBD disease (Li *et al*., 2022). Among psychological factors, alexithymia and maladaptive coping are known to negatively affect IBD conditions and patient's QoL (Carrozzino *et al*., 2018; Martino *et al*., 2020).

Alexithymia represents a multidimensional construct, defined as the difficulty in identifying, describing, and distinguishing feelings and it influences IBD patients' health independently from the clinical evolution of the disease (Porcelli *et al*., 1995; Viganò *et al*., 2018; Carrozzino & Porcelli, 2018). A high prevalence of alexithymia has been reported in patients affected by chronic immune-mediated diseases with somatic symptoms, with figures reaching 35% in IBD (Villoria *et al*., 2107; Erkic *et al*., 2018; Viganò *et al*., 2018) as well as alexithymia is deeply linked to severity of bowel diseases. Patients with alexithymia could also experience difficulties in recognizing body perceptions, implicating even a delayed IBD diagnosis and a deeper suffering (Porcelli *et al*., 1996; Ferreiro *et al*., 2015). Furthermore, research evidence suggested that stress may boost bowel motility and secretion (Maudsley & Rampton, 2005) thus negatively conditioning the IBDs course. Coping and defense mechanisms, defined as strategies activated to minimize, alleviate, and to overcome personal and situational stressors, has been proved to be related to reducing IBDs symptoms and improving HR-QoL (Mussel *et al*., 2004; Dorrian *et al*., 2009).

Hypotheses

In the present study we aimed to verify whether i) IBD patients report low quality of life in absence of comorbid mental disorders; ii) lower psychological resources, identified as maladaptive coping and defense mechanisms, were associated with higher psychological symptoms and lower HR-QoL; and iii) CD patients differ from UC patients in terms of psychological resources and mental distress. We expected moderate levels of HR-QoL, significant relationships between coping and defense mechanisms and psychological symptoms, and significant differences between CD and UC patients regarding the specific ways they cope with stressful situations.

Methods

Participants and procedure

Participants (n=84) were consecutively recruited at the outpatients IBD Unit, Department of Clinical and Experimental Medicine, University Hospital "G. Martino", Messina, Italy. Inclusion criteria were subject aged ≥18 years, suffering from UC or CD, diagnosed at least six months before our study, and receiving appropriate maintenance medical treatment, accordingly to the IBD remission phase. Exclusion criteria were alcohol or drug abuse; known psychiatric conditions; assumption of psychotropic agents; from moderate to severe respiratory, kidney or liver failure; heart failure with New York Hearth Association (NYHA) class ≥2; endocrine disorders and cancer. For each participant gender, age at diagnosis, smoking habits and family history of IBD, comorbidities and related treatments were collected. Informed written consent was obtained from each subject to enter the study, which was approved by the Ethics Committee University Hospital "G. Martino", Messina, Italy (protocol n. 2533 as of 30/01/2020) and that has been carried out in accordance with the principles of the Declaration of Helsinki and its later amendments. Patients' psychological symptoms and resources were assessed by a clinical psychologist in a confidential setting throughout a gold standard diagnostic interview and validated self-reported measures. Medical records, sociodemographic data (*i.e.* age, gender, educational levels, marital status) were collected by a clinician.

Measurements

All psychological aspects were assessed using self-reported measures validated in Italian language. Quality of life was measured with the Short Form-12 questionnaire (SF-12) (Gandek *et al*., 1998) and the short Inflammatory Bowel Disease Questionnaire (IBDQ) (Ciccocioppo *et al*., 2011). The SF-12, which provides subscales of mental and physical health (labeled as MCS and PCS, respectively), was performed to evaluate the general health perception, with higher scores indicating better health outcomes. The 10-item IBDQ was administered to detect subjects' health perception related to the gastrointestinal chronic bowel disease. Depressive symptoms were assessed using the Beck Depression Inventory-second edition (BDI-II; Beck *et al*. 1996), while anxiety symptoms were assessed using the Hamilton Anxiety Rating Scale (HAM-A) (Hamilton MA, 1959). Coping styles were tested through the New Italian Version Coping Ori-

entation to Problems Experienced (COPE-NVI-25), exploring five coping styles, including avoidance strategies, transcendent orientation, positive attitude, social support, and problem orientation (Foà *et al*., 2015). Defense mechanisms were assessed with the Defense Mechanisms Inventory (DMI), which includes five defense styles such as turning against object (TAO), projection (PRO), principalization (PRN), turning against self (TAS), and reversal (REV) (Ihilevich *et al*., 1994). Finally, alexithymia was assessed using the Toronto Alexithymia Scale (TAS-20) which distinguish three subscales namely Difficulty in Identify Feelings (DIF), Difficulty in Describing Feelings (DDF) and External Oriented Thinking (EOT) (Bressi *et al*., 1996; Taylor *et al*., 1999; Taylor GJ, 2000; Taylor *et al*., 2003). Bagby *et al*. (1994) proposed three cut-off scores to recognize alexithymic individuals (≥61), borderline (from 51 to 60) and non-alexithymic individuals (≤50).

Statistical analyses

Descriptive statistics were performed to analyze clinical and socio-demographic characteristics and levels of QoL, psychological symptoms and resources (*i.e.* coping, defenses and alexithymia) in IBD patients. Pearson's correlation was used to test associations between alexithymia, coping and defensive strategies on one side, and QoL and psychological symptoms on the other side. Student's *t* test for independent samples and the chi-square test were performed as appropriate to verify significant differences between CD and UC patients. Finally, a multiple regression analysis was used to explore the association between a dependent variable and one or more explanatory variables. Values of $p<0.05$ were considered statistically significant.

Results

Participants main socio-demographic and clinical characteristics are reported in Table 1. CD patients presented significantly higher mean age in comparison with UC patients (47.5±18 *vs* 37.5±14; p=0.005); they also presented a longer disease duration (14.3±10 *vs* 9.9±8; p=0.02) and a significantly different employment status. Levels of QoL, psychological symptoms and resources of IBD patients are shown in Table 2. Participants reported low-moderate QoL, as demonstrated by mean scores under the median value in both PCS and MCS subscales of the SF-12. Accordingly, IBDQ mean score failed in the moderate QoL range. Concerning psychological symptoms, IBD patients showed low to moderate anxiety (21.5±11.2) and possible presence of alexithymia (52.1±14.5). Particularly, higher anxiety levels were found in women in comparison with men (24.4±11 *vs* 19.1±10,0; p=0.02). Depressive symptoms were also higher in women (15.8±8.1 *vs* 11.2±6.5; p=0.005). Women suffering from IBD showed a lower QoL in comparison with men (45.9±8.5 *vs* 52.4±8.7; p=0.001). Concerning psychological resources, the mostly used coping strategies were positive attitude and problem solving (25.2±5.1 and 22.4±4.5, respectively), while the mostly used defensive strategy was reversal (54.7±13.5).

Age was positively associated with anxiety ($r=0.37$; p=0.001) and alexithymia ($r=0.22$; p=0.04).

The relationships between psychological resources, symptoms, and QoL are displayed in Table 3. All coping and defensive strategies were related with symptoms or QoL (r ranging from 0.561 to 0.222), apart from social support and projection which did not show significant associations with distress and QoL.

Maladaptive coping and defenses, such as avoidance strategies and turning against self, were positively associated with depression, while avoidance and turning to religion were positively associated with anxiety. Turning against objects and avoidance were also positively associated with alexithymia. Conversely, adaptive coping and defenses, such as positive attitude and principalization, showed negative associations with depression, anxiety and alexithymia, while problem solving showed negative association with alexithymia. Similarly, adaptive coping and defensive strategies resulted associated with mental health (r ranging from 0.430 to 0.320), whereas maladaptive coping and defenses, such as turning against self/objects and avoidance, were associated with mental distress. Moreover, positive attitude coping showed significant positive relationship with QoL ($r=0.222$; $p<0.05$), while turning to religion showed significant negative relationship with physical health (r=-0.430; $p<0.001$).

Differences between patients diagnosed with CD and those diagnosed with UC concerning QoL, symptoms, coping and defense mechanisms, and alexithymia, were analyzed and are displayed in Table 4. CD and UC patients did not show significant differences in neither psychological symptoms nor QoL, as well

Table 1. Main socio-demographic and clinical characteristics of participants.

	Total (n=84)	CD (n=33)	UC (n=51)	p
Clinical characteristics				
Age, years	41.5±16.6	47.5±18	37.5±14.3	0.005
Gender (%)	47 (56)	22 (66)	25 (49)	0.2
Body mass index, kg/m^2	24.0±3.8	24.3±3.7	23.7±3.9	0.50
Time since diagnosis, years	11.7±9.2	14.4±10.4	9.9±8	0.02
Education, n (%)				
Primary school	3 (3.6)	3 (9.1)	0 (0)	
Secondary school	13 (15.4)	8 (24.3)	5 (9.8)	
High school	40 (47.7)	13 (39.0)	27 (52.9)	
Bachelor's degree	25 (29.8)	8 (24.3)	17 (33.3)	
PhD or specialization	3 (3.5)	1 (3.0)	2 (3.9)	0.06
Employment status, n (%)				
Full time	50 (60)	19 (58)	31 (61)	
Unemployed	14 (17)	2 (6)	12 (24)	
Retired	20 (24)	12 (36)	8 (16)	0.02

CD, Crohn disease; UC, ulcerative colitis. Values are reported as mean ± standard deviation or crude numbers (percentages).

as in coping strategies used to deal with stress. However, t-test analyses revealed significant differences between IBD patients in defensive strategies, with CD patients using significantly more turning against objects (CD mean=52.7 *vs* UC mean=46.6; p=0.02) and projections (CD mean=53.7 *vs* UC mean=49.1; p=0.01) and UC patients using significantly more reversal (CD mean=50.9 *vs* UC mean=57.2; p=0.04).

The results of the multiple regression analysis, considering IBDQ as dependent variable, and including as explanatory variables age, BMI, disease duration, TAS-20, COPE, DMI, HAM-A and BDI-II, only HAM-A (β=-0.28, p=0.02, SE=0.09) and BDI-II (β=-0.31, p=0.02, SE=0.13) were found to be independently associated with QoL.

Discussion

Individual psychological response to chronic disease is of crucial importance in planning an effective treatment. In particular, patient's adaptational strategies can significantly influence the subjective perception of the illness, thus impacting on psychological well-being and QoL. To the best of our knowledge this is the first study exploring integrated psychological features in patients with IBDs. The present study focused on the HR-QoL of patients suffering from CD and UC, two of the most frequent chronic inflammatory diseases of the intestine, exploring clinical psychological features which may impact disease's onset and

Table 2. Descriptive statistics of QoL, psychological symptoms and resources in inflammatory bowel disease patients (n=84).

	95% CI	Min	Max	Mean	SD
SIBDQ	46.00	22.00	68.00	49.49	9.2
PCS	39.35	24.21	63.56	45.8	9.3
MCS	39.06	21.63	60.69	41.5	11.0
HAM_TOTAL	47.00	2.00	49.00	21.5	11.2
HAM_PSY	22.00	1.00	23.00	11.6	5.5
HAM_SOM	26.00	0.00	26.00	9.9	6.2
BDI_TOTAL	36.00	0.00	36.00	13.3	7.6
TAS20_TOTAL	64.00	23.00	87.00	52.0	14.5
DMI_TAO	59.00	18.00	77.00	49.0	11.8
DMI_PRO	43.00	27.00	70.00	50.9	8.8
DMI_PRN	39.00	27.00	66.00	48.6	9.6
DMI_TAS	68.00	20.00	88.00	47.4	11.2
DMI_REV	80.00	9.00	89.00	54.7	13.6
COPE_POS	26.00	10.00	36.00	25.3	5.1
COPE_SOC	25.00	5.00	30.00	19.8	5.9
COPE_PROBL	19.00	11.00	30.00	22.5	4.6
COPE_TRASC	20.00	4.00	24.00	13.4	7.0
COPE_AVOID	24.00	5.00	29.00	12.4	5.5

CI, confidence interval; SD, standard deviation; SIBDQ, Short Inflammatory Bowel disease Questionnaire; PCS, physical component summary; MCS, mental component summary; HAM-A, Hamilton Anxiety Rating Scale; HAM-PSY, psychic anxiety; HAM-SOM, somatic anxiety; BDI-II, Beck Depression Inventory II version; TAS-20, Toronto Alexithymia Scale 20-item version; DMI, defense mechanism inventory; DMI-TAO, Turning Against Object; DMI-PRO, Projection; DMI-PRN, Principalization; DMI-TAS, Turning Against Self; DMI-REV, Reversal; COPE-NVI-25, Coping Orientation to Problems Experienced; COPE-POS, Positive Aptitude; COPE-SOC, Social support; COPE-PROBL, Problem solving; COPE-TRASC, Trascendental; COPE-AVOID, Avoidance strategies.

Table 3. Correlations between psychological resources, symptoms, and quality of life in irritable bowel disease patients (n=84).

	IBDQ	PCS	MCS	BDI	HAM	TAS
DMI_TAO	-0.041	0.029	-0.239*	0.149	0.158	0.258*
DMI_PRO	-0.080	-0.099	0.049	0.013	0.038	0.022
DMI_PRN	-0.199	-0.003	0.430***	-0.389***	-0.318**	-0.427***
DMI_TAS	-0.019	0.198	-0.232*	0.269*	0.064	0.186
DMI_REV	-0.006	-0.084	0.136	-0.114	-0.066	-0.235*
COPE_POS	0.222*	0.011	0.350**	-0.353**	-0.314**	-0.406***
COPE_SOC	-0.205	-0.188	-0.024	0.073	0.123	-0.155
COPE_PROBL	0.031	-0.050	0.320**	-0.154	-0.183	-0.547***
COPE_TRASC	-0.181	-0.430***	-0.076	-0.037	0.252*	0.090
COPE_AVOID	-0.206	-0.198	-0.362***	0.242*	0.561***	0.512***

IBDQ, Inflammatory Bowel Disease Questionnaire; PCS, physical component summary; MCS, mental component summary; BDI, Beck Depression Inventory; HAM, Hamilton Anxiety Rating Scale; TAS, Turning Against Self; DMI, defense mechanism inventory; DMI-TAO, Turning Against Object; DMI-PRO, Projection; DMI-PRN, Principalization; DMI-TAS, Turning Against Self; DMI-REV, Reversal; COPE-NVI-25, Coping Orientation to Problems Experienced; COPE-POS, Positive Aptitude; COPE-SOC, Social support; COPE-PROBL, Problem solving; COPE-TRASC, Trascendental; COPE-AVOID, Avoidance strategies. *p<.05; **p<.01; ***p<.001.

clinical course. The numerous investigated components of both physical and mental conditions allowed the in-depth detection of interrelations between HR-QoL, symptoms and resources of patients diagnosed with IBD, as well as the analysis of clinical psychological aspects characteristic of CD and UC patients.

Regarding our first hypothesis, that IBD patients reported low quality of life in absence of comorbid mental disorders, results demonstrated low HR-QoL in IBD patients, with not significant differences between CD and UC. This main finding fully confirmed our expectation and suggests the impaired life conditions of individuals affected by IBD in line with literature (Carrozzino *et al*., 2018).

Regarding our second hypothesis, that lower psychological resources were associated with higher psychological symptoms and lower HR-QoL, we found that maladaptive coping and defense styles were related to mental distress, symptoms of depression and anxiety, as well as with higher level of alexithymia. More specifically, while avoidance resulted the only coping style associated with symptoms and alexithymia, defensive style of turning against self, turning to religion, and turning against objects were positively associated with depression, anxiety, and alexithymia, respectively. Conversely, adaptive coping and defenses were related to mental health and higher HR-QoL. These findings confirmed the importance of assessing coping and defenses following a hierarchical approach that may inform on the level of maturity and adaptation of strategies used to protect the individual from stressors (Di Giuseppe *et al*., 2020; 2022).

Regarding our third hypothesis, that CD patients differ from UC patients in psychological resources and mental distress, resulted partially confirmed. CD patients did not differ from UC patients, except for defense mechanisms. CD participants used significantly more maladaptive defenses as turning against objects and projections compared to UC participants, which instead tended to use significantly more reversal defense style. From a qualitative perspective, these findings support an interesting psychosomatic hypothesis of potential influences of personality patterns in the etiology of chronic diseases. CD's defense style seems characterized by aggressiveness toward the others and external reality (turning against objects) and blindness of patient's own feelings, thoughts, desires, which are instead seen in others (projection), while UC mainly recurs to a repressive defense style (reversal) the to deal with internal or external stressors, involving the inhibition of the experience and expression of negative feelings and unpleasant cognition to prevent one's positive self-image from being threatened (Weber *et al*., 2021). Overall, the present study provides empirical evidence of the potential role of defense mechanisms in contributing to initiation of chronic disease such as IBDs.

Apart from medical treatment, which efficiently control gastrointestinal symptoms, the typical IBDs relapsing-remitting course may trigger psychological distress to a such chronic disease. Even in this perspective, unconscious defenses may play a key role in the burden of IBD predisposing to a particular mental approach and representing a possible target in the long term integrated clinical management of IBD. In fact, adaptive coping and defense mechanisms become essential in helping the individual

Table 4. Differences between Crohn disease (n=33) and ulcerative colitis (n=51) patients on symptoms, quality of life, coping and defenses.

	t	p	Δ mean	95% CI	
				Lower	Upper
BDI	0.229	0.820	0.399	-3.089	3.887
HAM-TOTAL	1.245	0.219	3.299	-2.015	8,614
HAM-PSI	0.807	0.423	1.057	-1.567	3.681
HAM-SOM	1.542	0.129	2.242	-0.671	5.156
PCS	-0.739	0.463	-1.574	-5.830	2.681
MCS	-0.729	0.469	-1.798	-6.724	3.126
TAS-TOTAL	-0.265	0.792	-0.877	-7.481	5.727
TAS-DIF	-0.626	0.533	-0.991	-4.150	2.168
TAS-DDF	-0.607	0.546	-0.695	-2.977	1.587
TAS-EOT	-0.627	0.533	0.809	-1.769	3.388
DMI-TAO	2.276	*0.026*	6.069	0.736	11.402
DMI-PRO	2.455	*0.016*	4.588	0.864	8.312
DMI-PRN	-1.145	0.256	-2.438	-6.686	1.809
DMI-TAS	-1.401	0.165	-3162	-7.653	1.328
DMI-REV	-2.057	*0.044*	-6.306	-12.454	-0.177
COPE-POS	-0.376	0.233	-0.431	-2.720	1.857
COPE-SOC	0.056	0.708	0.073	-2.525	2.671
COPE-PROBL	-1.456	0.955	-1.563	-3.715	0.588
COPE-TRASC	0.278	0.782	0.450	-2.792	3.694
COPE-AVOID	1.798	0.078	2.338	-0.268	4.945

BDI-II, Beck Depression Inventory II version; HAM-A, Hamilton Anxiety Rating Scale; HAM-PSY, psychic anxiety; HAM-SOM, somatic anxiety; PCS, physical component summary; MCS, mental component summary; TAS-20, Toronto Alexithymia Scale 20-item version; DIF, difficulty identifying feelings; DDF, difficulty describing feelings; EOT, externally oriented thinking; DMI, defense mechanism inventory; DMI-TAO, Turning Against Object; DMI-PRO, Projection; DMI-PRN, Principalization; DMI-TAS, Turning Against Self; DMI-REV, Reversal; COPE-NVI-25, Coping Orientation to Problems Experienced; COPE-POS, Positive Aptitude; COPE-SOC, Social support; COPE-PROBL, Problem solving; COPE-TRASC, Trascendental; COPE-AVOID, Avoidance strategies. Values in italics are significatively.

in dealing with disease-related distress, whereas alexithymia and maladaptive coping and defense style could negative influence the course of the illness. Moreover, alexithymia, and clinical psychological symptoms may compromise patient's compliance and adherence, leading to frequent relapses and to a worse clinical course of IBD (Viola *et al*., 2023). Even though IBD affects both genders equally, our study confirmed women with IBD showed higher prevalence of anxiety and depressive symptoms, together with lower HR-QoL (Hardy *et al*., 2022). Age was also associated with higher anxiety and alexithymia, suggesting a possible explanatory role of chronic fatigue, levels of stress, and persistent abdominal pain even in the remission phase (Villoria *et al*., 2019). It is also known that less abdominal pain is associated with some coping strategies (Sweeney *et al*., 2018) underlining the significant potential role of adaptive styles. Moreover, it has been suggested the positive role of psychological intervention, involving coping, problem solving or emotion-oriented, as main complementary strategy application to improve the course of IBD (Triantafillidis *et al*., 2013).

Finally, some considerations about the limitations of the study are due. The cross-sectional design limits the interpretation of the results beyond the associations between QoL, symptoms, coping and defense styles, and alexithymia. Since the conducted analyses do not imply causality, future research should replicate these findings in longitudinal studies. Moreover, the relatively small sample did not represent equally CD and UC diagnoses. Studies on larger paired samples could add significant information to present findings. Furthermore, although the use of self-report measures may limit external validity and introduce limitations associated with the type of assessment methodology (Perry & Ianni, 1998), the gold standard diagnostic interview represented a strength (Fava *et al*., 2012). Further research should improve the exploration of coping and defense mechanisms by recurring also to gold-standard measures for assessing such controversial constructs (Silvermann & Aafjes-van Doorn, 2023; Di Giuseppe *et al*., 2021).

In summary, these findings suggest that particular attention should be paid to adaptation strategies such as coping and defense mechanisms, which play a key role in promoting therapeutic compliance and psychological well-being (Conversano *et al*., 2023). Tailoring therapeutic intervention based on improving individual's adaptive responses to stressful disease-related consequences could effectively enhances patient's mental health and overall higher QoL.

Conclusions

This study found low quality of life in patients with IBD without significant differences between CD and UC. Maladaptive coping and defense styles were related to mental distress, symptoms of depression and anxiety, as well as with higher level of alexithymia. Conversely, adaptive coping and defenses were related to mental health and higher HR-QoL. CD participants used significantly more maladaptive defenses as turning against objects and projections compared to UC participants, which instead tended to use significantly more reversal defense style.

Our research suggests that a multi-integrated clinical strategy is appropriate to realize a global intervention on IBD. A deep investigation of psychological features of IDB is fundamental to better understand patient's vulnerability and may lead to tailored interventions improving patients' psychological resources and perceived HR-QoL.

References

American Psychiatric Association, (2013). *Diagnostic and Statistical Manual of Mental Disorders, 5th edn*. Washington, DC: American Psychiatric Association.

Bagby, R.M., Taylor, G.J., & Parker, J.D., (1994). The Twenty-item Toronto Alexithymia Scale--II. Convergent, discriminant, and concurrent validity. *Journal of Psychosomatic Research*, *38*(1), 33-40. doi: 10.1016/0022-3999(94)90006-x.

Barberio, B., Zamani, M., Black, C.J., Savarino, E.V., & Ford, A.C., (2021). Prevalence of symptoms of anxiety and depression in patients with inflammatory bowel disease: a systematic review and meta-analysis. *The Lancet Gastroenterology and Hepatology, 6*(5), 359-370. doi: 10.1016/S2468-1253(21)00014-5.

Beck, A.T., Steer, R.A., & Brown, G.K., (1996). *Manual for the Beck Depression Inventory–II.* San Antonio, TX: Psychological Corporation.

Boggatz, T., (2020). *Person-centred care and quality of life.* In: Quality of Life and Person-Centered Care for Older People. Springer, Cham.

Boldrini, T., Pontillo, M., Tanzilli, A., Giovanardi, G., Di Cicilia, G., Salcuni, S., Vicari, S., & Lingiardi, V., (2020). An attachment perspective on the risk for psychosis: clinical correlates and the predictive value of attachment patterns and mentalization. *Schizophrenia research*, *222*, 209-217. doi: 10.1016/j.schres.2020.05.052.

Bouwman, W., Verhaegh, W. & van de Stolpe, A., (2022). Improved diagnosis of inflammatory bowel disease and prediction and monitoring of response to anti-TNF alpha treatment based on measurement of signal transduction pathway activity. *Frontiers in Pharmacology, 13*, 1008976. doi: 10.3389/fphar.2022.1008976.

Bressi, C., Taylor, G., Parker, J., Bressi, S., Brambilla, V., Aguglia, E., Allegranti, I., Bongiorno, A., Giberti, F., Bucca, M., Todarello, O., Callegari, C., Vender, S., Gala, C., & Invernizzi, G., (1996). Cross validation of the factor structure of the 20-item Toronto Alexithymia Scale: an Italian multicenter study. *Journal of Psychosomatic Research, 41*(6), 551-559. doi: 10.1016/s0022-3999(96)00228-0.

Cai, Z., Wang, S., & Li, J., (2021). Treatment of inflammatory bowel disease: a comprehensive review. *Frontiers in Medicine*, *8*, 765474. doi: 10.3389/fmed.2021.765474

Carrozzino, D., & Porcelli, P., (2018). Alexithymia in gastroenterology and hepatology: a systematic review. *Frontiers in Psychology*, *9*, 470. doi: 10.3389/fpsyg.2018.00470.

Ciccocioppo, R., Klersy, C., Russo, M.L., Valli, M., Boccaccio, V., Imbesi, V., Ardizzone, S., Porro, G.B., & Corazza, G.R., (2011). Validation of the Italian translation of the Inflammatory Bowel Disease questionnaire. *Digestive and liver disease: official journal of the Italian Society of Gastroenterology and the Italian Association for the Study of the Liver, 43*(7), 535-541. doi: 10.1016/j.dld.2010.12.014.

Conversano, C., Di Giuseppe, M., & Lingiardi, V., (2023) Case report: changes in defense mechanisms, personality functioning, and body mass index during psychotherapy with patients with anorexia nervosa. *Frontiers in Psychology*, *14*, 1081467. doi: 10.3389/fpsyg.2023.1081467.

Conversano, C., Di Giuseppe, M., Miccoli, M., Ciacchini, R., Di Silvestre, A., Lo Sterzo, R., Gemignani, A., & Orrù, G., (2020). Retrospective analyses of psychological distress and defense style among cancer patients. *Clinical Neu-*

ropsychiatry, 17(4), 217-224. doi: 10.36131/cnfioritieditore 20200403

Di Giuseppe, M., Orrù, G., Gemignani, A., Ciacchini, R., Miniati, M., & Conversano, C., (2022). Mindfulness and defense mechanisms as explicit and implicit emotion regulation strategies against psychological distress during massive catastrophic events. *International Journal of Environmental Research and Public Health, 19*, 12690. doi: 10.3390/ijerph 191912690

Di Giuseppe, M., Prout, T. A., Fabiani, M., & Kui, T., (2020). Defensive profile of parents of children with externalizing problems receiving Regulation-Focused Psychotherapy for Children (RFP-C): A pilot study. *Mediterranean Journal of Clinical Psychology, 8*(2). doi: 10.6092/2282-1619/mjcp-2515.

Di Giuseppe, M., Perry, J.C., Prout, T.A., & Conversano, C., (2021). Editorial: Recent empirical research and methodologies in defense mechanisms: Defenses as fundamental contributors to adaptation. *Frontiers in Psychology*, *12*, 802602. doi: 10.3389/fpsyg.2021.802602

Dorrian, A., Dempster, M., Adair, P., (2009). Adjustment to inflammatory bowel disease: the relative influence of illness perceptions and coping. *Inflammatory bowel disease, 15*(1), 47-55. doi: 10.1002/ibd.20583. PMID: 18626980.

Erkic, M., Bailer, J., Fenske, S. C., Schmidt, S. N. I., Trojan, J., & Schroder, A., (2018). Impaired emotion and a reduction in trust in patients with somatic symptom disorder. *Clinical Psychology & Psychotherapy, 25*, 163-172. doi: 10.1002/cpp.2151

Fava, G.A., Tomba, E., & Sonino, N., (2012). Clinimetrics: the science of clinical measurements. *International Journal of Clinical Practice, 66*, 11-15. doi: 10.1111/j.1742-1241.2011. 02825.

Foà, C., Tonarelli, A., Caricati, L., Fruggeri, L., (2015). COPE-NVI-25: validazione italiana della versione ridotta della Coping Orientation to the Problems Experienced (COPE-NVI). *Psicologia della salute*, *2*, 123-140. doi:10.3280/PDS2015-002007.

Galli, F., Tanzilli, A., Simonelli, A., Tassorelli, C., Sances, G., Parolin, M., Cristofalo, P., Gualco, I., & Lingiardi, V., (2019). Personality and personality disorders in medication-overuse headache: a controlled study by SWAP-200. *Pain Research & Management*, 2019, 1874078. doi: 10.1155/2019/1874078

Gandek, B., Ware, J.E., Aaronson, N.K., Apolone, G., Bjorner, J.B., Brazier, J.E., Bullinger, M., Kaasa, S., Leplege, A., Prieto, L., & Sullivan, M., (1998). Cross-validation of item selection and scoring for the SF-12 Health Survey in nine countries: results from the IQOLA Project. International Quality of Life Assessment. *Journal of Clinical Epidemiology*, *51*(11), 1171–1178. doi: 10.1016/s0895-4356(98)00109-7.

GBD 2017 Inflammatory Bowel Disease Collaborators, (2020). The global, regional, and national burden of inflammatory bowel disease in 195 countries and territories, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet Gastroenterology and Hepatology*, *5*(1):17-30. doi: 10.1016/S2468-1253(19)30333-4.

Ge, Li., Liu, S., Li, S., Yang, J., Hu, G., Xu, C. & Song, W., (2022). Psychological stress in inflammatory bowel disease: Psychoneuroimmunological insights into bidirectional gut–brain communications. *Frontiers in Immunology, 13*: 1016578. doi: 10.3389/fimmu.2022.1016578

Hamilton, M.A., (1959). The assessment of anxiety states by rating. *British Journal of Medical Psychology, 32*(1), 50-55. doi: 10.1111/j.2044-8341.1959.tb00467.

Hardy, P.Y., Fikri, J., Libbrecht, D., Louis, E., & Joris, J., (2022). Pain characteristics in patients with inflammatory bowel disease: a monocentric cross-sectional study. *J Crohns Colitis*, *16*(9), 1363-1371. doi:10.1093/ecco-jcc/jjac051.

Ihilevich, D., & Gleser, G.C. (1994). D.M.I. – Defense Mechanisms Inventory. Firenze: *Organizzazioni Speciali.*

Jordan, C., Sin, J., Fear, N.T., & Chalder, T., (2016). A systematic review of the psychological correlates of adjustment outcomes in adults with inflammatory bowel disease. *Clinical Psychology Review, 47*, 28-40. doi: 10.1016/j.cpr.2016. 06.001.

Lazurus, R.S., & Folkman, S. (1984). *Stress, appraisal and coping*. New York: Springer.

Leone, D., Gilardi, D., Corrò, B.E., Menichetti, J., Vegni, E., Correale, C., Mariangela, A., Furfaro, F., Bonovas, S., Peyrin-Biroulet, L., Danese, S., & Fiorino, G. (2019). Psychological characteristics of inflammatory bowel disease patients: a comparison between active and nonactive patients. *Inflammatory Bowel Diseases*, *25*(8), 1399-1407. doi: 10.1093/ibd/izy400.

Lingiardi, V., Gazzillo, F., Colli, A., De Bei, F., Tanzilli, A., Di Giuseppe, M., Nardelli, N., Caristo, C., Condino, V., Gentile, D., & Dazzi, N. (2010). Diagnosis and assessment of personality, therapeutic alliance and clinical exchange in psychotherapy research. *Research in Psychotherapy: Psychopathology, Process and Outcome, 2*, 97-124. doi: 10.4081/ripppo. 2010.36.

Martino, G., Caputo, A., Schwarz, P., Bellone, F., Fries, W., Quattropani, M.C., & Vicario, C.M., (2020). Alexithymia and inflammatory bowel disease: a systematic review. *Frontiers in Psychology*, *11*, 1763. doi: 10.3389/fpsyg.2020.01763.

Mawdsley, J.E., & Rampton, D.S., (2005). Psychological stress in IBD: new insights into pathogenic and therapeutic implications. *Gut, 54*(10), 1481-1491. doi: 10.1136/gut.2005. 064261.

Mowat, C., Cole, A., Windsor, A., Ahmad, T., Arnott, I., Driscoll, R., Mitton, S., Orchard, T., Rutter, M., Younge, L., Lees, C., Ho, G. T., Satsangi, J., Bloom, S., & IBD Section of the British Society of Gastroenterology, (2011). Guidelines for the management of inflammatory bowel disease in adults. *Gut*, *60*(5), 571-607. doi: 10.1136/gut.2010.224154.

Mussell, M., Böcker, U., Nagel, N., & Singer, M.V., (2004). Predictors of disease-related concerns and other aspects of health-related quality of life in outpatients with inflammatory bowel disease. *European Journal of Gastroenterology and Hepatology*, *l16*(12), 1273-1280. doi: 10.1097/00042737-200412000-00007.

Perry, J.C., & Ianni, F.F. (1998). Observer-rated measures of defense mechanisms. *Journal of Personality, 66*(6), 993-1024. doi: 10.1111/1467-6494.00040.

Porcelli, P., De Carne, N., & Leandro, G. (2014). Alexithymia and gastrointestinal specific anxiety in moderate to severe irritable bowel syndrome. *Comprehensive Psychiatry, 55*, 1647-1653. doi: 10.1016/j.comppsych.2014.05.022.

Porcelli, P., Leoci, C., Guerra, V., Taylor, G.J., & Bagby, R.M., (1996). A longitudinal study of alexithymia and psychological distress in inflammatory bowel disease. *Journal of Psychosomatic Research, 41*, 569-573. doi: 10.1016/S0022-3999(96) 00221-8.

Porcelli, P., Zaka S., Leoci, C., Centonze, S., & Taylor, G.J., (1995). Alexithymia in inflammatory bowel disease. A case control study. *Psychotherapy and Psychosomatics, 64*, 49-53. doi: 10.1159/000288990.

Shafer, L.A., Walker, J.R., Restall, G., Chhibba, T., Ivekovic, M.,

Singh, H., Targownik, L.E., & Bernstein, C.N. (2019). Association between IBD disability and reduced work productivity (presenteeism): a population-based study in Manitoba, Canada. *Inflammatory Bowel Diseases*, *25*(2), 352-359. doi: 10.1093/ibd/izy236.

Silverman, J., & Aafjes-van Doorn, K., (2023). Coping and defense mechanims: a scoping review. *Clinical Psychology: Science and Practice,* in press.

Sweeney, L., Moss-Morris, R., Czuber-Dochan, W., Meade, L., Chumbley, G., & Norton, C. (2018). Systematic review: psychosocial factors associated with pain in inflammatory bowel disease. *Alimentary Pharmacology & Therapeutics*, *47*(6), 715-729. doi: 10.1111/apt.14493.

Szigethy, E.M., Allen, J.I., Reiss, M., Cohen, W., Perera, L.P., Brillstein, L., Cross, R.K., Schwartz, D.A., Kosinski, L.R., Colton, J.B., LaRusso, E., Atreja, A., & Regueiro, M.D., (2017). White paper AGA: the impact of mental and psychosocial factors on the care of patients with inflammatory bowel disease. *Clinical gastroenterology and hepatology: the official clinical practice journal of the American Gastroenterological Association*, *15*(7), 986-997. doi: 10.1016/j.cgh.2017.02.037.

Taylor, G.J., (2000). Recent developments in alexithymia theory and research. *Canadian Journal of Psychiatry,* 45, 134-142. doi: 10.1177/070674370004500203.

Taylor, G.J., Bagby, R.M., & Parker, J.D., (1999). Disorders of affect regulation: alexithymia in medical and psychiatric illness. Cambridge: *Cambridge University Press.*

Taylor, G.J., Bagby, R.M., & Parker, J.D., (2003). The 20-Item Toronto Alexithymia Scale: IV. reliability and factorial validity in different languages and cultures. *Journal of Psychosomatic Research, 55*, 277–283. doi: 10.1016/S0022-3999(02)00601-3.

Triantafillidis, J.K., Merikas, E., & Gikas, A. (2013). Psychological factors and stress in inflammatory bowel disease. *Expert Review of Gastroenterology & Hepatology*, 7(3), 225-238. doi: 10.1586/egh.13.4.

Vicario, C.M., Nitsche, M.A., Salehienjad, M.A., Avanzino, L., & Martino, G., (2020). Time processing, interoception and insula activation: a mini review on clinical disorders. *Frontiers in Psychology,* doi: 10.3389/fpsyg.2020.01893.

Viganò, C.A., Beltrami, M.M., Bosi, M.F., Zanello, R., Valtorta, M., & Maconi, G., (2018). Alexithymia and psychopathology in patients suffering from inflammatory bowel disease: arising differences and correlations to tailoring therapeutic strategies. *Frontiers in Psychiatry* 9:324. doi: 10.3389/fpsyt.2018.00324.

Villoria, A., García, V., Dosa, A., Moreno, L., Montserrat, A., & Figuerola A., (2017). Fatigue in out-patients with inflammatory bowel disease: prevalence and predictive factors. *PLoS ONE* 12:e0181435. doi: 10.1371/journal.pone.0181435.

Weber, R., Ehrenthal, J.C., Brock-Midding, E., Halbach, S., Würstlein, R., Kowalski, C., & Ernstmann, N. (2021). Defense mechanisms and repressive coping among male breast cancer patients. *Frontiers in psychiatry*, *12*, 718076. doi: 10.3389/fpsyt.2021.718076.

Viola, A., Demarzo, M.G., Abbruzzese, A., Muscianisi, M., Chiappetta, M.F., Costantino, G., Ksissa, O., Alibrandi A, Fries, W. (2023). Low adherence is associated with chronic active disease in Ulcerative Colitis: a retrospective study from a single referral center. *Patient Preference and Adherence,* in press.