

Diagnosis and Psychotherapeutic Needs by Freiburg Personality Inventory in Inflammatory Bowel Disease

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Abstract

Background Despite recent discoveries in pharmacotherapy and psychotherapy, patients with inflammatory bowel disease (IBD) still face challenges with improvement, remission, and healing. The objectives of the study were to identify the characteristics of patients with IBD with the Freiburg Personality Inventory and the intensity of the colonic disease, comorbidities, and other factors that could be related to the personality of the subjects.

Methods Data were collected in the period 2019–2020 from 46 patients from records at two hospitals. This study used nonparametric methods, such as the Wilcoxon-Mann–Whitney, Kolmogorov–Smirnov, Mann–Whitney U test, and BOOTSTRAP method. The control group was considered the national normative sample based on the average raw scores on the 12 personality assessment scales using the t test (one sample t test).

Results Compared to the control group, the Inhibitedness, Health Concerns, and Emotionality scales had significantly higher raw scores. Additionally, the Social Orientation, Frankness, and Extraversion scales had significantly lower raw scores. Health status was a medical factor that influenced personality scales. On the Somatic Complaints scale, patients who had lesions or comorbidities had significantly higher raw scores. Patients who had comorbidities in addition to IBD had considerably higher raw scores on the Excitability scale.

Conclusions Positive affective and cognitive adjustment interventions may aid people with IBD in managing life problems in a balanced manner while interpreting treatment outcomes with confidence. Psychotherapeutic change interventions regarding life perception are required to tackle the description of subjective suffering related to physical inconveniences (Somatic Complaints scale), a strong orientation toward performance (Strain scale), mood swings, anxiety, and pessimism (Emotionality scale). Another intervention is reconsidering values and (re)prioritization, such as family, intimate relationships, friends, health, growth, development, balanced work, all of which can promote a feeling of well-being and balance.

Background

Despite recent discoveries in pharmacotherapy, inflammatory bowel disease (IBD), which encompasses two major conditions, ulcerative colitis (UC) and Crohn's disease (CD), still poses challenges in terms of improvement, remission, and healing. The main classes of drugs used in CD and UC are aminosalicylates, corticosteroids, antibiotics, immunomodulators, and biological agents (infliximab, adalimumab, vedolizumab, ustekinumab). Unique to UC, new nonbiological small molecules, whether approved or under study, represented by Janus kinase (JAK) inhibitors and sphingosine 1-phosphate receptor modulators, are included [1, 2].

IBD has no identified etiology because it is driven by multiple environmental variables, genetic predispositions, and faulty immunological responses. The unusually strong immunological response to

an invading virus or bacteria that targets the digestive tract is thought to play a role. IBD is exacerbated by noncausal aggravating factors such as diet and stress [3–5]. UC and CD are two conditions with a wide range of symptoms, including diarrhea, fatigue, abdominal pain and cramping, blood in the stool, decreased appetite, and unintended weight loss [6].

Diarrhea, which can become uncontrollable in some severe episodes, can render the patient's everyday life ineffective from a professional and relational standpoint, with moving from one place to another posing a difficulty for any sufferer. Studies on patients with IBD concerning drug treatment methods and required surgery have revealed more information about efficacy, side effects, complications, and other issues [7, 8].

The difficulty in achieving substantial improvements, frequent recurrences, the risk of complications (including fecal incontinence), and the necessity of surgery generate unpleasant feelings. Some researchers have focused on psychological factors, beliefs, and stress as causes and potential triggers [9, 10]. Others have been curious about the efficacy of psychotherapeutic interventions for health amelioration, improved disease management, and even healing [11–13]. The outcomes of the research on the psychological issues prompted by this condition has not achieved unanimous agreement. The following are a few examples.

Until the 1990s, it was believed that certain psychological traits, such as the tension between the need to perform duties and the lack of motivation or capacity to do so, contributed to the development of UC. The classification of IBD has transitioned from a psychosomatic disease to a condition with multicausal pathology, thus growing beyond the biomedical paradigm to invite research on the social, psychological, and behavioral dimensions of the disease [14].

Helzer et al. [15] examined 50 patients with CD and 50 control group participants with chronic medical diseases from a university clinic and a private clinic. Compared to the control group, a significantly higher number of patients with CD met the criteria for various psychiatric disorders at some point in their lives and were diagnosed with depression. However, there was no indication of a link between mental disorders and CD, according to the researchers.

Andrews et al. [16] evaluated depression and anxiety in 162 patients with CD using the Hospital Anxiety and Depression Scale and conducted an even more thorough assessment based on the Diagnostic and Statistical Manual of Mental Disorders, Third Edition. Again, there was no evidence of a connection between CD and mental illness. Furthermore, psychiatric illness was present to a lesser extent in patients in remission who were feeling well. Physical recovery was more difficult for psychiatric patients.

Nevertheless, according to Tarter et al. [17], people with CD exhibit significant levels of anxiety, sadness, and panic disorder throughout their lifetimes. Before the onset of the disease, patients with CD manifested a higher prevalence of panic disorder than the general population. No psychiatric disorders were observed in patients with UC before or after the onset of the disease.

Küchenhoff and Manz [18] found a connection between defense and coping, which they described as a dynamic interaction that evolves as the disease progresses. Küchenhoff et al. [19] discovered that coping resources in CD patients in remission are major indicators of disease progression. Personality traits were linked to the coping mechanisms of depressed people. Over the course of three years at the Heidelberg University Hospital, Küchenhoff [20] studied the biological, psychological, and social attributes of CD patients and emphasized the role of a multidisciplinary approach. Although the researcher did not believe that patients with CD possess distinct personality patterns, Küchenhoff [20] did consider that personality traits and the ability to cope with psychological issues were substantial factors in the evolution of the disease.

Enck and Schäfer [21] noted that personality traits and psychopathologies had no significant influence on the onset of the condition and that the effects of psychosocial stress on symptoms had not been confirmed. According to scholars, poor psychological test results should be considered a consequence of the condition rather than a cause. Nonetheless, they noticed that patients with CD might have a reduced ability to cope with daily struggles, which is why psychotherapy would be beneficial but would have no effect on the advancement of the disease.

In his dissertation defense held at Justus Liebig University in Giessen (Faculty of Human Medicine), Osborn [22] reviewed the literature on the psychological characteristics of patients with CD since 1932, the same year that Crohn et al. [23] reported a novel disease entity known as regional ileitis, which was subsequently renamed Crohn's disease. From a psychological point of view, Osborn [22] argues that research that addresses patients with CD as a homogeneous group is of questionable value.

In a review of the literature, Kessler and Von Wietersheim [24] concluded that there was no specific personality profile of patients with IBD and that psychotherapy did not affect the disease but that psychotherapy could improve the psychological state of patients who experienced high levels of stress, depression, and frequent recurrences. Furthermore, only 11 articles focused on the influence of psychological stress on IBD, according to a literature review by Keefer et al. [25], and only half of these demonstrated that stress impacted IBD.

Other researchers, however, recognize stressors as having a detrimental impact on IBD patients. Rada et al. [26] conducted a study on 33 patients with IBD who were evaluated between 2013 and 2015. The patients completed one omnibus type and seven psychological questionnaires, although deep psychosocial anamnesis, semistructured interviews, and observation were also used to reconstruct key episodes for some participants. The authors reported a case study of a patient who was diagnosed with UC in 2008 and underwent treatment. Existential family events were viewed as catastrophic, causing the patient to become frustrated and exhausted. Instability, emotion, and hypertension were all detectable in psychological surveys. According to the authors, a thorough psychosocial anamnesis was required to uncover the emotional stress experienced by patients with UC, as well as to identify the ways in which psychotherapy could be used in addition to pharmacological treatment. Additionally, as part of this research, Rada et al. [27] provided a case study of a patient diagnosed with CD in 2005, in which it was

documented that the patient faced events that they experienced along with intense negative emotions that might have triggered the disease and subsequent short-term remissions, not only prior to the diagnosis but also in the years that followed. Another example from the same research was that of a patient diagnosed with CD in 1978 who experienced five negative stressors that were devastating and humiliating during the observation period. Perfectionism was evident in the patient's life story, and the Jenkins questionnaire revealed that the patient was punctual, overly active, and reacted immediately under stress [28].

Given the foregoing, the purpose of this article is to provide additional information regarding specific psychological factors and personality traits that may be involved in IBD and in the management of this condition.

Materials And Methods

Procedure

The Patient Assessment Sheet (individual and disease parameters) was completed by the physician at the end of this set of questionnaires and mainly included the following: treatment history, comorbidities, medication, disease extension, pattern of evolution, surgical history, status of biological activity, and related questions. Between January 2019 and December 2020, the participants were selected randomly from hospital records in Romania, Bucharest and Craiova. A total of 28 patients in the hospital answered the questionnaires with the help of the physician whose records they were in or a resident physician. A total of 18 patients chose to complete the questionnaires at home and then bring them to the hospital on their first appointment, which had to be sooner than a month away. The physician in charge of the patient records or a resident physician double-checked the answers for accuracy and completeness. Subsequently, between January and March 2021, when ambiguities were discovered during data entry in the computerized system, the person responsible for collecting the questionnaires, in collaboration with the expert psychologist, discussed these concerns with the patient via e-mail or telephone.

The research was approved by the ethics committee, all patients signed written consent for participation and to publish results before enrolment in the study. The study followed the Declaration of Helsinki to grant respect for human rights among all study participants during all phases of the study.

Measures

The following areas were covered by an omnibus questionnaire based on sociodemographic data: stressors (family of origin and reproduction), situational life factors (tension-generating stressors), relationships, gender, sex, sexuality, and health (diagnosis, weight, sleep, alcohol consumption, smoking, use of complementary treatments, and other factors). Additionally, patients were asked to answer a set of psychological questionnaires, namely, Freiburg Personality Inventory - Revised (FPI-R) (Fahrenberg, Hampel & Selg, 2001) a tool validated with the Romanian population and used under license, The Depression, Anxiety, and Stress Scale with 21 items (DASS-21) (Lovibond & Lovibond, 1995) adapted,

standardized, and validated with the Romanian population; and The Young Schema Questionnaire - Short form (YSQ-S3), validated with the Romanian population (Trip, 2006). Additionally, 53 items from the COPE Inventory (Carver, Scheier & Weintraub 1989) validated on the Romanian population (Craşovan & Sava, 2013).

This study will analyze the results from the Freiburg Personality Inventory - Revised (FPI-R), some data from the Omnibus questionnaire and medical files. The objectives of the study were to identify the characteristics of patients with IBD by FPI-R and medical factors such as the intensity of the colonic disease, treatment, comorbidities, and other factors that could be related to the personality of the subjects using the raw scores observed on the 12 FPI-R scales.

The Freiburg Personality Inventory - Revised (FPI-R) (Freiburger Persönlichkeits Inventar), an omnibus assessment tool developed by Fahrenberg, Hampel & Selg (2001) according to the multiphase model, was used to assess adult personality dimensions. The FPI-R test was adapted and validated for Romania in 2007. Based on the answers to 138 items, the test evaluates personality on 12 assessment scales: Life Satisfaction (LEB), Social Orientation (SOZ), Achievement Orientation (LEI), Inhibitedness (GEH), Excitability (ERR), Aggressiveness (AGGR), Strain (BEAN), Somatic Complaints (KORP), Health Concerns (GES), Frankness (OFF), Extraversion (E), and Emotionality (N). The national normative reference sample for Romania included 2,400 participants, 1,200 women and 1,200 men.

Statistical analyses

In this research, the control group was considered the national normative sample in terms of the average raw scores on the 12 personality assessment scales using the t test (one sample t test). SPSS Statistics (IBM Corp, 2019) and Cytel StatXact version 12 (Cytel Inc, 2020) were used for data analysis.

When the sample size is small, with strongly related or asymmetric data, as was the case in this research with N=46 participants, the asymptotic results given by some traditional methods may not be valid. In such situations, the p asymptotic values may differ substantially from the exact p values. Consequently, erroneous inferences can be drawn from asymptotic and other approximate data. To overcome these constraints, StatXact was utilized, as well as Monte Carlo, which allows for reliable inferences. StatXact uses highly efficient numerical algorithms to calculate exact p values and confidence intervals (Mehta & Patel, 1996).

A fundamental characteristic of exact methods is that statistical tests and confidence intervals are based on actual probability calculations, applicable to any sample size, to eliminate some of the unreasonable assumptions of traditional statistical methods, particularly for small samples.

This research used nonparametric methods, such as the Wilcoxon-Mann-Whitney test, a type of exact method, which does not make distribution assumptions. The test has the advantage that it can be used when the hypothesis of a normal distribution of variables of interest is not reasonable.

The analysis of the raw scores on the 12 scales indicated that only on three scales, ERR, E and N, was the distribution statistically normal ($p > 0.05$) according to the Kolmogorov–Smirnov asymptotic nonparametric test for normality. After including the exact method or the Monte Carlo method in the Kolmogorov–Smirnov test with 10,000 samples, it was concluded that on all 12 scales, the distribution of raw scores was statistically close to normal ($p > 0.05$).

The aim of the first analysis was to identify any significant differences between the studied sample and the national normative sample in terms of the average raw scores on the 12 scales of personality assessment using the t test (one sample t test). For this purpose, the averages observed in the studied sample were compared with the corresponding averages from the national sample published by the authors of the FPI-R validation in Romania. Significant differences were identified on six scales. For reevaluation, the BOOTSTRAP method from SPSS featuring 10,000 samples was used.

To identify possible relationships between FPI-R personality factors and medical factors, the Mann–Whitney U test (the asymptotic method), the exact Wilcoxon–Mann–Whitney test (performed in Cytel Studio with the Monte Carlo method), and the Kendall Statistics tau-b for nonparametric correlations were deployed. To estimate the effect size for the t test used (called d or d Cohen), the mean difference, taken as the absolute value, at the standard deviation reported in SPSS was divided. Thus, the magnitude of the IBD effect on personality was assessed.

Results

Demographic features and the status of IBD

The 46 participants were aged 16 to 76 (mean 41.80; median 37.00, std. deviation 14.95). Between 1978 and 2019, the participants were diagnosed with UC and CD. Table 1 shows the basic structure of the sample, which includes a higher share of men, urban residents, married people, active workers, and UC patients.

Table 1
Basic Structure of the Sample

Sociodemographic data and diagnostic	N	%
Gender		
Female	19	41.3
Male	27	58.7
Place of residence		
Urban	40	87
Rural	6	13
Marital status		
Married	27	58.7
Unmarried (single)	9	19.6
Consensual union over 1 year	6	13.0
Divorced	4	8.7
Employment Status		
Active (employee)	28	60.9
Retired	9	19.6
Unemployed	6	13
Student	3	6.5
Diagnostic		
Ulcerative Colitis	27	58.7
Crohn's disease	19	41.3

According to the biological criteria C Reactive Protein (CRP), Erythrocytes Sedimentation Rate (ESR), and Fecal Calprotectin, the disease was active at 39%; according to the Clinical Disease Activity Index (CDAI) and the Mayo Score (UCDAI, Ulcerative Colitis Disease Activity Index), the status of clinical activity was mild or moderate, 39.2%; and according to the results of colonoscopy (lower digestive endoscopy), 71.7% had mild and severe lesions. A total of 32.6% had comorbidities. Two patients who were diagnosed with UC in 2019 and had a biologically active disease with minor lesions under home treatment died at the end of the data collection period. A 31-year-old unemployed female patient, rural resident, presenting various comorbidities, died in intensive care with sepsis because of a severe form of colitis after being operated

on twice. In the case of a 48-year-old man, urban resident, active worker, the causes of death remain unknown.

Personality traits according to the Freiburg Personality Inventory

For the 12 FPI-R personality measurement scales, Life Satisfaction (LEB), Social Orientation (SOZ), Achievement Orientation (LEI), Inhibitedness (GEH), Excitability (ERR), Aggressiveness (AGGR), Strain (BEAN), Somatic Complaints (KORP), Health Concerns (GES), Frankness (OFF), Extraversion (E), and Emotionality (N), raw scores were calculated using (in accordance with each scale) the sum scores (0=false or 1=true), obtained from groups of 12 or 14 items, from the 138 items indicated in the Freiburg Inventory methodology. The means and standard deviations for the raw scores are shown in Table 2.

Table 2

Averages and Standard Deviations for the Raw Scores on the Freiburg Personality Inventory Scales

Scale No.	FPI-R Scales	N	Average	Standard Deviation	Minimum	Maximum
1	Life satisfaction (LEB)	46	6.87	2.13	1	11
2	Social Orientation (SOZ)	46	6.07	2.16	0	10
3	Achievement Orientation (LEI)	46	7.72	2.44	2	12
4	Inhibitedness (GEH)	46	5.96	2.80	1	11
5	Excitability (ERR)	46	4.57	2.78	0	12
6	Aggressiveness (AGGR)	46	3.83	2.51	0	10
7	Strain (BEAN)	46	6.54	2.97	0	12
8	Somatic Complaints (KORP)	46	4.67	3.33	0	12
9	Health Concerns (GES)	46	8.13	2.47	1	12
10	Frankness (OFF)	46	6.22	2.06	1	10
11	Extraversion (E)	46	7.13	2.80	0	14
12	Emotionality (N)	46	6.85	3.97	0	14

There was no significant difference between the normative sample (considered control) and the group of patients with IBD on scales 1, 3, 5, 6, 7, and 8. The t test (one sample t test) revealed significant

differences on six evaluation scales, which were revalidated using the BOOTSTRAP method, as shown in Table 3.

Table 3
Significant Results on the Freiburg Personality Inventory Scales

Scale	Significant raw score in samples		Bootstrap comparable level of significance
	IBD patients	normative	
<i>Social Orientation</i> (SOZ, scale 2)	6.07; -0.71 lower , 95% CI [0.07 to 1.36]	6.78; t(45)=-2.24, p=0.030	p=0.049
They tend to be sterner, masculine, confrontational, and aloof, as they value individual responsibility for living conditions over societal duty.			
<i>Inhibitedness</i> (GEH, scale 4)	5.96; +0.84 higher , 95% CI [0.0 to 1.67]	5.12; t(45)=-2.23, p=0.049	p=0.049
They appear cautious, insecure, and favor solitary occupations to social interactions. They prefer to remain in the background, find it unsettling to stand out in front of others, and have difficulty forming deep bonds with their peers.			
<i>Health Concerns</i> (GES, scale 9)	8.13; +0.98 higher , 95% CI [0.25 to 1.71]	7.15; t(45)=2.69, p=0.010	p=0.009
They frequently turn to medicine, as well as tight food and lifestyle restrictions. They are exceedingly cautious in regard to washing produce, avoiding crowded areas, and other decisions, whether for legitimate or fictitious reasons.			
<i>Frankness</i> (OFF, scale 10)	6.22; -0.72 lower , 95% CI [0.11 to 1.34]	6.94; t(45) =-2.37, p=0.022	p=0.023
They tend to hardly admit that they have minor shortcomings that can occur in anyone's life (e.g., being late for school, making minor exaggerations of facts) in order to render a favorable impression. It may be a low level of self-criticism, or self-idealization.			
<i>Extraversion</i> (E, scale 11)	7.13; -1.20 lower , 95% CI [0.37 to 2.03]	8.33; t(45)=-2.904, p=0.006	p=0.006
They tend to be private individuals, less communicative, self-controlled, serious, and introverted. They are not prepared for competitive behavior. They would rather be alone than in the company of others, and they tend to be dominated in social circumstances.			
<i>Emotionality</i> (N, scale 12)	6.85; +1.35 higher , 95% CI [0.17 to 2.53]	5.50; t(45)=2.301, p=0.026	An average difference of -2.36 in the confidence interval

Scale	Significant raw score in samples	Bootstrap comparable level of significance
	IBD patients	normative

They tend to have a sensitive, nervous, gloomy, addicted, and suspicious personality. They are in serious need of emotional support from people who do not think they are being heard. Interpersonal interactions are often avoided. They suffer from psychosomatic symptoms and are overwhelmed by events that cause anxiety

Variability of scores on the Freiburg Personality Inventory scales according to medical factors

The raw scores observed on the 12 FPI-R scales showed no statistically significant difference between the normative sample (considered control) and the patient sample with IBD on nine scales (Life Satisfaction, Social Orientation, Achievement Orientation, Inhibitedness, Aggressiveness, Health Concerns, Frankness, Extraversion, and Emotionality) in the data analysis on the severity of colonic disease, comorbidities, and treatment, which could potentially be related to the personality of the participants.

Table 4 presents the three scales for which associations were identified between higher scores (Somatic Complaints, Strain, and Excitability) and the status of endoscopic activity and comorbidities.

Table 4
Analysis of Significant Medical Factors and Their Effect.

Scale	Medical factors Statistical differences based on the Mann– Whitney U Test, asymptotic method	Wilcoxon-Mann– Whitney test results, exact, performed in Cytel Studio with the Monte Carlo method	Kendall tau-b statistical association results for nonparametric correlations (effects)
Somatic Complaints scale (KORP) Higher scores among those with lesions	Presence/absence of lesions U=296, p=0.044	p=0.046 95% CI [0.040 to 0.051]	$\tau_b=0.259$, p=0.044
Somatic Complaints scale (KORP) Higher scores among those with comorbidities	Presence/absence of comorbidities U=340, p=0.011	p=0.012 95% CI [0.004 to 0.009]	$\tau_b=0.327$, p=0.011. A strong and significant association (over 0.3) between the status of comorbidities and the raw score.
Those with lesions and comorbidities may suffer from insomnia, weather sensitivity, and asthenia or depression because of meteorological fluctuations. Headaches, abnormal heart function (arrhythmias), hot flashes, sensitive stomach, nervous tics, suffocation, shaky hands, and other symptoms are common.			
Strain (BEAN) Higher scores among those with disease in remission	Active/remission U=164, p=0.046	p=0.042 95% CI [0.036 to 0,046]	$\tau_b=-0,257$, p=0.046
Strain (BEAN) Higher scores among those with CD	UC/IBD U=164.5, p=0.041	p=0.042 95% CI [0.037 to 0.047]	$\tau_b=-0,263$, p=0.041
Both individuals in remission and those with CD reported feeling overwhelmed, anxious, overworked, and stressed. They were experiencing psychological stress, which might manifest as nervousness, a lack of energy, and fatigue. They are typically hard workers who want to save money so that they may spend more time with their families on weekends.			
Excitability (ERR) Higher scores among those with comorbidities	Presence/absence of comorbidities U=339, p=0.012	p=0.010 95% CI [0.008 to 0.013].	$\tau_b = 0,323$, p = 0.012 A strong and significant association (over 0.3) between the status of comorbidities and the raw score.
Participants with comorbidities were more likely to be impulsive, agitated, and uncontrollable.			

Discussion

What the Freiburg Personality Inventory indicates about patients with IBD

The scores obtained with a sample of IBD patients were compared to the Romanian national reference standard, and a series of statistically significant differences were discovered. Other findings, both similar and dissimilar, are discussed below. It was assumed that the score level would exhibit some correlation. Consequently, Extraversion and Social Orientation scores were lower, whereas the Emotionality score was higher.

Higher scores on the Inhibitedness scale suggest a predisposition toward repressed feelings, insecurity, and avoidance of social engagement in the investigated group. Probst et al. [37] reported similar results in that patients were described as more tense, more inhibited, more reserved, less aggressive, and less friendly compared to the control group. These traits indicate a type D personality, often known as the "distressed" personality, which is characterized by negative affectivity and social inhibition. These individuals are at risk for a variety of health issues, including burnout, poor living standards, cardiovascular disease, and gastrointestinal dysfunction [38].

The Extraversion scale, which Eysenck conceptualized as a continuum from extraversion to introversion, was used to examine another important aspect of personality. Patients with IBD in this group had lower scores, which was expected, given that the Inhibitedness scale score was higher. They were introverted, reserved, distant, self-controlled, and noncommittal. In a study conducted by Sajadinejad et al. [39], 58 patients with UC and 59 healthy control participants (selected from their family members) were assessed using the NEO Personality Inventory in Five Factors, the type D personality questionnaire, and the WHO quality of life questionnaire. Patients with UC scored lower on extraversion and higher on neuroticism and had a higher share of type D personality traits than the control group. Patients with UC who had a type D personality reported considerably lower average ratings on the Quality of Life Questionnaire than patients without a type D personality.

Within the group of patients with IBD, the highest scores on the Emotionality scale, defined as neuroticism by Eysenck and Eysenck [40] and McCrae and Costa [41] in the Big Five questionnaire, highlight the fact that they tend to be emotionally unstable and experience more internal conflicts. Their psychological condition was frequently unbalanced, with the patients acting excitable and easily provoked at times and asthenic, low energy, or uncommitted at other times. In terms of neuroticism, the findings were similar not only to those of the aforementioned study but also to those obtained by La Barbera et al. [42], who evaluated 100 people with IBD and a control group of 66 healthy people at a hospital in Palermo, Italy. Neuroticism, alexithymia (particularly external thinking), impulsive behaviors, and possibly traits perceived as feminine were discovered in a group predisposed to the development of IBD. The Romanian sample, unlike the Italian sample, showed no violent tendencies.

The low extraversion and strong emotionality revealed in the Romanian sample were likewise found in other groups who answered various questionnaires to measure similar characteristics. In addition, Tkalčić

et al. [43] studied 34 patients with UC, 30 with CD, and 86 with IBD, as well as 122 healthy people and discovered that neuroticism was a strong predictor of both physical and mental aspects of quality of life.

The lower scores on the Social Orientation scale imply that patients with IBD from this study are less eager to care for sick people, are less warm and affective in interpersonal connections and are less supportive of others when compared to the national normative sample. Although no paper that referred to this scale was found, it is possible that patients' lack of social and emotional involvement stemmed from their own need for care and emotional support. That is, this lack could be a protective or energy-saving mechanism.

Higher ratings on the Health Concerns scale suggest a fear of illness (infections, accidents), cautious conduct, and even hypochondria in the tested respondents. These people seek medical advice but are dubious of it, frequently seeking a second opinion. They examine medical treatments, alternatives, and other therapies in depth. This finding is similar to what Witges et al. [44] found. The researchers employed the Health Anxiety Inventory, which evaluates difficulties related to the magnitude of health problems and discovered that individuals with IBD had high scores when their symptoms were more severe. Health anxiety can range from mild to severe, and it can be a reaction to a chronic illness. Any symptom that was prevalent in people without digestive issues, such as bloating, abdominal embarrassment, or soft stools, could be perceived as a symptom of recurrence in patients with IBD and thus be associated with concern and distress. Health anxiety has been studied in patients with cancer who have shown fear of recurrence [45], as well as those with various chronic diseases [46]. Lebel et al. [47] discuss health anxiety in the context of the removal of the diagnosis of hypochondria from the Diagnostic and Statistical Manual of Mental Disorders (DSM – 5) and the occurrence of the diagnosis. Somatic symptom disorder is frequently linked to medical conditions and according to the DSM-5, encompasses roughly three-quarters of people previously diagnosed with hypochondria. In the absence of somatic symptoms, a quarter of persons diagnosed with hypochondria had higher levels of health anxiety [48]. Health concerns in the absence of disease are distinct from health concerns in the presence of disease, particularly chronic diseases such as IBD. Additional research is required in this area, as it is essential to determine how many of these patients with IBD develop *anxiety disorder due to a medical condition* [48] .

Patients with IBD in this sample were firmly oriented in their conduct according to social norms and conventional rules of behavior and coexistence, as evidenced by their low score on the Frankness scale. They were interested in actively managing their impact on individuals around them to make a positive impression. This scale, which was not designed as a binary truth-lie mechanism, does not examine the willingness to notice modest behavioral flaws at the edge of social desirability, such as being late for school, making awful remarks about others, finding joy in other people's misery, and expressing opinions having the necessary expertise. The low scores in this sample show that the respondents were not open people, that they were unable to identify such minor social deviations and that they were also conformists, rigid in their approach to breaking certain social conventions.

Presenting a positive self-image to the public to make a positive impression is a common human phenomenon with both positive consequences (e.g., growth, modeling, self-identity, relationships, personal branding) and negative consequences (e.g., manipulation) [49, 50]. To cope, people with IBD may exhibit sensitivity to how they are regarded by others and a fixation on value aspects, such as the need to fit into desirable groups. Additional research is required to fully understand this issue.

The Freiburg Personality Inventory based on medical factors in patients with IBD

The current study found that the activity of the disease and comorbidities influenced several psychological aspects, including the patient's quality of life, an aspect that has also been confirmed by other studies.

Patients with lesions and comorbidities scored higher on the Somatic Complaints scale, as expected. Patients with comorbidities also had higher scores on the Excitability scale. Patients with IBD who had lesions and comorbidities exhibited physical symptoms and were asthenic, anxious about how they would cope with problems and generally pessimistic. Roy et al. [51] examined data from the Multi-Ethnic Study of Atherosclerosis (MESA), which included 6,814 people aged 45 to 84 with no history of clinical cardiovascular disease. The researchers wanted to see how optimism and pessimism were linked to a variety of medical markers, such as interleukin-6, C-reactive protein, fibrinogen, and homocysteine, and discovered that pessimism was associated with greater levels of inflammatory markers. The high scores on the Somatic Complaints scale indicated pessimism in Romanian patients with IBD who participated in this study, suggesting the need for psychotherapy, personal development (for a more positive outlook), and trust that the generated chemical processes could reduce inflammation.

Many studies have focused on fatigue in individuals with IBD, a disease that has been shown to have severe effects on the quality of life and professional activity [52]. Additionally, the role of bidirectional communication between the intestine and the central nervous system was explored (the bowel-brain axis) in mediating fatigue [53]. High scores on the Somatic Complaints scale revealed asthenia, or fatigue, in patients with IBD in this study, reflecting both the need for enhanced attention to treat anemia, monitoring of how they feed, and the utility of psychological interventions to manage fatigue. Furthermore, psychological and antidepressant therapy could help IBD patients with disrupted brain-intestinal activity. Additional research is required in this area [54].

The Excitability scale scores were higher in patients with IBD who also had comorbidities, indicating that they had reactive behavior, poor self-control, prolonged bouts of anger, and overly emotional reactions to life situations. It should be highlighted that the scores were greater only in patients with comorbidities, not in the control group. However, Rada et al. [26], Rada et al. [27], Rada and Andrei [28], in addition to using questionnaires and anamneses, employed in-depth interviews in the form of a "life story" or "personal biography notes" and found that patients with IBD tend to hyperbolize unpleasant life events.

Given that no higher score was detected on the *Aggressiveness* scale compared to the control group (normative sample), which would have suggested aggressive imposition of one's own beliefs and a level of hostility toward others, it is plausible that this feature was rather internal. Certainly, in addition to the features specific to IBD, the presence of comorbidities that include suffering and therapies could explain this loss of patience and emotional self-control. In the present study, there were inconsistencies between patients in remission and those in relapse on some psychological parameters. The findings are comparable to those of Küchenhoff [20], who studied 119 CD patients and 89 patients in remission; life satisfaction was much higher in those in remission, i.e., in relatively good health than in those in the acute phase. However, Mancina et al. [55], in a cross-sectional study on 109 IBD patients in clinical and endoscopic remission, found that the patient's quality of life was influenced by gastrointestinal symptoms.

Over the course of two years, Osborn [22] separated CD patients into several categories based on standardized questionnaires, clinical interviews, and thorough disease progression data. The variability of the factors of gender, education level, and marital status was found to be minimal, whereas the activity status of the disease showed fairly large variability depending on the duration and severity of the disease. Similarly, in this study of Romanian patients, no significant difference was detected based on sociodemographic variables, but the disease activity status revealed disparities on the Somatic Complaints and Excitability scales. This finding must be considered because Regev et al. [56] found that somatization was the only predictor of disease activity beyond depression and anxiety.

Surprisingly, patients in remission scored higher on the Strain scale. Being in remission and thus in reasonable health, it was expected that they would not feel overworked, tense, or as if they were being burdened by demanding requests. It is likely that people in remission seek to reclaim the time when they were in the midst of an active disease and could not keep up with the responsibilities of work or family life. To understand this issue, additional research, particularly qualitative research, is required.

In this study with a Romanian sample, patients with CD scored higher on the Strain scale than those with UC. This finding suggests that although the two conditions have similar symptoms and require similar pharmacological treatment, they should also be treated psychologically to some extent because, in contrast to patients with UC, social adjustment in patients with CD was more dependent on disease activity and was lower when stools and abdominal pain were more common. These results are consistent with those of Probst et al. [37], who used the FPI-R questionnaire and a semistandardized interview to examine the activity evolution and symptoms of 63 patients with CD and 58 patients with UC. FPI-R scores in CD patients were found to be more impacted by disease activity and somatic signs than in patients with UC. Differences between patients with CD and UC in a state of active disease regarding the impact of psychosocial variables were also found by Sarid et al. [57], which suggests the need for a relatively specific psychotherapeutic approach to the two conditions.

Conclusions

In terms of the scores observed on the FPI-R scales of Social Orientation, Inhibitedness, Health Concerns, Frankness, Extraversion, and Emotionality the personality of the subjects from the analyzed sample, individuals diagnosed with CD and UC was significantly influenced, compared to the national reference standard.

Raw scores on the Inhibitedness, Health Concerns, and Emotionality scales were all significantly higher in the IBD sample than the normative sample. Raw scores on the Social Orientation, Frankness, and Extraversion scales were all significantly lower in the IBD sample than the normative sample.

Health status is a medical factor that can influence personality scales. On the Somatic Complaints scale, patients with lesions or comorbidities diagnosed by endoscopic investigation had significantly higher raw scores than the normative sample. Patients with comorbidities in addition to IBD had considerably higher raw scores on the Excitability scale. This problem is serious and requires further study because it is possible that these high scores are predictors of IBD onset or recurrence. Moreover, although patients in remission are more psychologically balanced, it is still necessary to assess gastrointestinal symptoms because they could highlight hidden psychological imbalances.

Patients in remission diagnosed with CD also had higher scores on the Strain scale. IBD is a disabling condition that can take the patient out of the normal rhythm of work. The feeling of overwork or even real stress identified in this study in patients in remission requires a double vision of the trend toward high performance. On the one hand, it can be a mediating factor, and on the other hand, it may highlight the tendency to try to recover time that they could allocate to professional goals. Additional attention should be given in this regard, for this perspective may mean that patients with CD raise more problems than those with UC in terms of the experience of demands.

The *d* Cohen coefficient was below the reference value of 0.5 for all scales exhibiting significant differences, with a maximum of 0.43 on the OFF scale. This result suggests that IBD has a minor impact on personality. This result lends credence to the hypothesis that personality traits remain stable in adulthood and are difficult to change, even in the face of adversity. La Barbera et al. [42], however, argued for the existence of a distinct psychological functional aspect as a potential predictor in IBD patients.

Disorders of vegetative functions (autonomic/sympathetic/parasympathetic/digestive nervous system) tend to be correlated with emotional states rather than personality traits. Pellissier et al. [58] compared patients with Crohn's disease (n=26), ulcerative colitis (n=22), and irritable bowel syndrome (n=27) to 21 healthy subjects on affective adjustments and possible links between these affective adjustments and autonomic nervous system reactivity. The problem-focused approach had a favorable effect in all diseases, whereas the emotion-focused approach and the external health control focus had a negative effect, but the autonomic nervous system adapted differently.

Additional research is required to determine whether a person's psychological traits or personality factors can influence how they adapt to the disease and whether these can act as mediators of disease onset or outbreaks.

Certainly, a patient's life may change as a result of being diagnosed with a chronic condition in general and inflammatory bowel disease in particular, and some studies have discovered specific needs as well. Küchenhoff [20] revealed that having a close relative had favorable impacts on the patient's mental state and physical complaints in both the acute and remission phases, a finding that can be understood with psychosomatic disease theory. Early in its existence, a child's emotional life revolves around the feeding process, with sentiments of joy, gratification, relaxation, and assistance provided by the mother, or the person who feeds them, to whom the infant develops attachment. Thus, gastrointestinal issues in IBD that disturb emotions cause the patient to crave support from a close friend, as well as the desire to receive affection and assistance. This finding is yet another reason to value doctor-patient and psychotherapist-patient (or client) relationships.

Positive affective and cognitive adjustment interventions may aid people with IBD in managing life problems in a balanced manner while interpreting treatment outcomes with confidence. Psychotherapeutic change interventions regarding life perception are required to tackle the description of subjective suffering related to physical inconveniences (Somatic Complaints scale), a strong orientation toward performance (Strain scale), and mood swings, anxiety, and pessimism (Emotionality scale).

Another area of intervention is the fear of illness, which leads patients to seek exaggerated answers on alternative medical treatments. It is vital to monitor patients with IBD to ensure that they do not develop anxiety disorder because of their medical condition. Additionally, modifying negative automatic beliefs, such as exaggerating when faced with minor digestive problems, is beneficial.

Personality is expressed through traits, as well as unique adaptations at the dynamic-energetic (temperament), relational-value, and self-regulation levels (character). Temperament is more biological, stable, and intrinsic. Consequently, it is indeed crucial to remember that structure and behaviors are guided by values or what a person considers to be significant in life, as these become goals. Consequently, in patients with IBD, another line of intervention is reconsidering values and (re)prioritization, such as family, intimate relationships, friends, health, growth, development, and balanced work, all of which can promote a feeling of well-being and balance.

The formation of a balanced emotional disposition and the maintenance of activity levels are essential in patients with chronic, difficult-to-control diseases. Both actions can generate pleasant emotions and defend against negative emotions, resulting in a sense of fulfillment and improved management of the barriers of this state or the existential events that occur in life.

Abbreviations

IBD: inflammatory bowel disease

UC: ulcerative colitis

CD: Crohn's disease

Declarations

Ethics Approval

Based on the submitted documentation, the Ethics Commission of “Francis I. Rainer” Anthropology Institute of the Romanian Academy, Bucharest, Romania issued the approval decision no. 55 / 23-01-2019.

Consent for Publication

Written consent to publish results and for participation, were obtained from all individual participants before enrolment in the study.

Availability of Data and Material

The dataset analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The research was based on volunteering, both the study participants and the work team did not receive money or other benefits

Authors' Contributions

The authors contributed equally to this study regarding data collection, conception, design, material preparation, draft of the manuscript. Statistical analysis were performed by the author of the correspondence. All authors read and approved the final manuscript.

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