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*Article*

# Predictors of Stress, Anxiety, Depression and Quality of Life in Patients Diagnosed with Chronic Inflammatory Bowel Disease in Romania: A Prospective Observational Case-Report Study

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## Abstract

**Background&Aims:** Inflammatory bowel disease (IBD), encompassing Crohn's disease (CD) and ulcerative colitis (UC), is strongly linked to psychological comorbidities such as depression, anxiety, and stress. These mental health factors negatively impact disease progression, healthcare utilization, and quality of life (QoL). **Methods:** We conducted a cross-sectional case-control study (Nov 2023–Feb 2025) involving 355 participants: 55 with CD, 90 with UC, and 210 healthy controls. Participants completed the Depression Anxiety Stress Scales 21 (DASS-21) and EuroQol (EQ-5D-5L) questionnaires. Statistical analyses included multivariate linear regressions to identify predictors of psychological distress. **Results:** IBD patients reported significantly higher levels of stress ($p< 0.01$), anxiety ($p=0.016$), and depression ($p< 0.01$) compared to controls. Severe or very severe symptoms were more prevalent in CD and UC. Relative risk for stress was high (RR=2.1) and risk for depression was significantly elevated (RR=1.54) in IBD population. QoL analysis revealed lower EQ-VAS scores and increased difficulties across all EQ-5D-5L domains, particularly in emotional well-being and pain. Multivariate analysis showed UC diagnosis, female sex, and corticosteroid use as predictors of higher stress and depression scores, while self-reported rest was consistently protective. **Conclusions:** This study confirms the psychological burden of IBD and underscores the importance of regular screening for stress, anxiety, and depression in clinical care. Self-reported rest emerged as a key protective factor, suggesting potential benefits from interventions targeting sleep quality and emotional support. Future research should explore longitudinal outcomes and personalized psychological interventions in IBD populations.

**Keywords:** anxiety; depression;quality of life; chronic inflammatory bowel disease; ulcerative colitis; Crohn's disease; anxiety

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## 1. Introduction

Inflammatory bowel diseases (IBD), primarily represented by Crohn's disease (CD) and ulcerative colitis (UC), are significantly associated with depression, suggesting a bidirectional relationship between these conditions. Studies indicate a prevalence of 15.2% for depressive disorders and 21.6% for depressive symptoms among IBD patients [1]. Genetically predicted depression increases the risk of developing IBD [2].. Conversely, IBD patients also have an elevated risk of depression [3]. Female gender, lack of social support, and active disease are independent predictors of depression in IBD patients [4]. Depression rates are higher during active disease compared to remission [1,5]. Depression adversely affects disease outcomes, increasing the risk of relapse, medical costs, and emergency department visits [4,5]. Immunosuppressive therapies, particularly anti-TNF treatments, can reduce depressive symptoms [6].

Anxiety is also significantly associated with IBD, with studies reporting a prevalence of 20.9%, higher than the 15% seen in the general population [7]. A bidirectional relationship exists between anxiety and IBD, with active disease strongly correlated with higher anxiety rates compared to remission [8]. Female gender, smoking, extraintestinal manifestations, and a history of surgical interventions independently predict anxiety in IBD patients [9]. Anti-TNF and immunomodulator therapies have shown significant reductions in anxiety symptoms over periods of up to five years [10].

Stress significantly influences the onset and progression of IBD. Extended stressful events are linked to higher relapse rates (90% vs. 40% in low-stress individuals) [11]. Recent research highlights elevated stress rates among IBD patients [11,12]. A survey on patients during the COVID-19 pandemic found that 63.7% reported increased stress, with 21.1% experiencing worsened gastrointestinal symptoms [13]. Early life stressors are more common among IBD patients, suggesting childhood stress may contribute to disease development [14].

Given their high prevalence and impact in IBD, routine screening and management of psychological conditions are recommended as part of comprehensive patient care [8].

## 2. Materials and Methods

To assess the impact of IBD on mental health, we conducted a prospective cross-sectional case-control study (Nov 2023 – Feb 2025) in Cluj-Napoca, involving several clinical hopsitals. Medical staff distributed anonymous questionnaires to patients with confirmed IBD diagnoses during routine follow-up visits. The IBD group included adults (≥18 years) with confirmed diagnoses of CD or UC who consented to participate. The control group consisted of adults without IBD who also provided informed consent.

Participants completed a demographic and disease-specific section (for IBD patients), followed by Depression-Anxiety-Stress Scale (DASS-21), which includes 21 items divided into 3 subscales, depression, anxiety, and stress, each with 7 items scored from 0 to 3; final scores are multiplied by 2 and the EQ-5D-5L (which evaluates five dimensions: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression, each with 5 severity levels).

*Statistic Analysis*

Data were analyzed using IBM SPSS v26. For normally distributed continuous variables, mean and standard deviation were reported; for non-normal distributions, median and interquartile range (IQR) were used. Categorical variables were presented as counts and percentages. Group comparisons were performed using independent t-tests for continuous variables and Chi-square or Fisher's exact test for categorical data (significance threshold $p<0.05$). For non-normally distributed variables across three groups, the Kruskal-Wallis test with nonparametric post-hoc tests was applied. Multivariate linear models were used to assess associations between disease group (CD, UC, Control) and psychological scores (depression, anxiety, stress). When residuals were non-normally distributed, the square root transformation was applied. Models were adjusted for confounders

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based on clinical relevance and literature. Multicollinearity was assessed using correlation matrices and variance inflation factor. Heteroscedasticity was tested with the Breusch-Pagan test and QQ plots. Linearity was checked using component-plus-residual plots.

## 3. Results

### *3.1. Demographic Characteristics of Groups*

The study included 355 participants, stratified in 3 groups, 55 with CD, 90 with UC and 210 in Control Group. There were no significant differences in gender, age, residence environment, proffesional activity, BMI and sleep hours between groups. Demographic data can be consulted in Table 1.

**Table 1.** Demographic data of included patients.

| | CD (n=55) | UC (n=90) | Control (n=210) | P |
|---|---|---|---|---|
| Age | 37,40 (33,99 - 40,81) | 41,20(37,80 - 44,60) | 40,86(38,82 - 42,90) | 0,586 |
| Female gender | 33 (60%) | 55 (61,1%) | 130 (61,9%) | 0,96 |
| Civil status | | | | **<0,01** |
| Single | 17 (30,9%) | 21 (23,4%) | 31 (14,7%) | |
| Stable relationship | 10 (18,2%) | 15 (16,7%) | 18 (8,6%) | |
| Married | 24 (43,6%) | 45 (50%) | 154 (73,3%) | |
| Divorced | 2 (3,6%) | 6 (6,6%) | 2 (1%) | |
| Widowed | 2 (3,6%) | 3 (3,3%) | 5 (2,4%) | |
| Urban living area | 51 (92,7%) | 75 (83,3%) | 180 (85,7%) | 0,26 |
| Proffesional activity | | | | 0,44 |
| Employee | 41 (74,5%) | 55 (61,1%) | 155 (69%) | |
| Retired | 6 (12,7%) | 16 (17,8%) | 40 (19%) | |
| Unemployed | 1 (1,8%) | 5 (5,6%) | 2 (1%) | |
| Student, trainee | 6 (10,9%) | 12 (13,3%) | 18 (8,6%) | |
| Education (years) | 13,91(13,05 - 14,77) | 15,42(14,71 - 16,13) | 15,51(15,03 - 15,99) | **0,006** |
| BMI (kg/m$^2$) | 24,72(23,64 - 25,81) | 24,12(23,12 - 25,12) | 25,77(25,02 - 26,52) | 0,097 |
| Hours of sleep | 6,79(6,58 - 7) | 6,70(6,51 - 6,89) | 6,73(6,61 - 6,85) | 0,975 |

### *3.2. Characteristics of the IBD Groups*

Table 2 summarizes key clinical features of CD and UC patients. Most patients did not follow a specific diet. Complications, such as fistulas, abscesses, and extraintestinal manifestations (uveitis, arthralgia, sacroiliitis) were reported more frequently in CD.

**Table 2.** IBD Patients characteristics.

| | CD (n=55) | UC (n=90) | P |
|---|---|---|---|
| Time since IBD diagnosis | | | 0,69 |
| Less than 1 year | 3 (5,4%) | 9 (10%) | |
| 1-5 years | 24 (43,6%) | 41 (45,5%) | |
| 6-10 years | 15 (27,2%) | 19 (21,1%) | |
| Over 10 years | 13 (23,6%) | 21 (23,3%) | |
| Specific dietary regimen | 10 (18,1%) | 19 (21,1%) | 0,66 |
| IBD complications | 29 (52,7%) | 24 (26,6%) | **<0,01** |
| Surgical treatment of complications | 13 (23,6%) | 4 (4,4%) | **<0,01** |
| Corticodependence | 10 (18,1%) | 9 (10%) | 0,15 |
| Disease modifying therapy | | | 0,43 |
| 5ASA | 12 (21,6%) | 43 (47,7%) | |
| Biologic | 32 (59%) | 32 (35,4%) | |

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| | | |
|---|---|---|
| Imnunosupresor | 4 (7,2%) | 4 (4,4%) |
| Homeopatic or probiotic | 0 (0%) | 4 (4,4%) |
| None | 7 (12,7%) | 7 (7,7%) |

*3.3. Risk Factors Associated with CD, UC, and the Control Group*

Risk factor analysis revealed some statistically significant differences between groups. Weight category was similar across groups. Smoking status showed no significant difference. Reported standard of living differed significantly, with CD and UC patients more likely to report poor or average living conditions, while the control group reported better living standards (Table 3).

**Table 3.** Risk factors among the three groups.

| | CD (n=55) | UC (n=90) | Control (n=210) | P |
|---|---|---|---|---|
| Smoking status | | | | 0,18 |
| Yes | 17 (30,9%) | 21 (23,3%) | 57 (27,1%) | |
| No | 29 (52,7%) | 62 (68,8%) | 140 (66,6%) | |
| Abstinent | 8 (14,5) | 7 (7,7%) | 13 (6,1%) | |
| Standard of living | | | | **<0,0001** |
| Difficult | 12 (21,8%) | 13 (14,4%) | 6 (2,8%) | |
| Decent | 18 (32,7%) | 31 (34,4%) | 83 (39,5%) | |
| Good | 24 (43,6%) | 43 (47,7%) | 100 (47,6%) | |
| Very good | 1 (1,8%) | 3 (3,3%) | 21 (10%) | |
| Reported rest (Yes) | 30 (54,5%) | 52 (57,7%) | 141 (67,1%) | 0,11 |
| Physical activity (Yes) | 19 (34,5%) | 48 (53,3%) | 111 (52,8%) | **0,04** |
| Alcohol consumption | 21 (38,2%) | 39 (56,7%) | 142 (32,4%) | **<0,01** |

*3.4. DASS-21 Score Distribution and Risk of Psychological Disorders.*

DASS-21 analysis showed worse psychological symptoms in IBD patients (Table 4).

**Table 4.** Stress, anxiety and depression scores among the three groups. (a) No significant differences between two groups; (b) No significant differences between two groups.

| | CD (n=55) | UC (n=90) | Control (n=210) | P |
|---|---|---|---|---|
| Stress level | | | | **< 0,01** |
| Normal | 31 (56,4%) (a) | 47 (52,2%) (a) | 164 (78,1%) (b) | |
| Mild | 8 (14,5%) (a) | 11 (12,2%) (a) | 19 (9%) (a) | |
| Moderate | 7 (12,7%) (a) | 8 (8,9%) (a) | 17 (8,1%) (a) | |
| Severe | 3 (5,5%) (a) (b) | 11 (12,2%) (b) | 4 (1,9%) (a) | |
| Very severe | 6 (10,9%) (a) | 13 (14,4%) (a) | 6 (2,9%) (b) | |
| Anxiety level | | | | 0,016 |
| Normal | 24 (43,6%) (a) | 35 (38,9%) (a) | 104 (49,5%) (a) | |
| Mild | 5 (9,1%) (a) | 11 (12,2%) (a) | 46 (21,9%) (a) | |
| Moderate | 9 (16,4%) (a) | 16 (17,8%) (a) | 27 (12,9%) (a) | |
| Severe | 6 (10,9%) (a) | 8 (8,9%) (a) | 13 (6,2%) (a) | |
| Very severe | 11 (20%) (a) (b) | 20 (22,2%) (a) | 20 (9,5%) (a) | |
| Depression level | | | | **<0,01** |
| Normal | 31 (56,4%) (a) (b) | 48 (53,3%) (b) | 148 (70,5%) (a) | |
| Mild | 6 (10,9%) (a) | 5 (5,6%) (a) | 23 (11%) (a) | |
| Moderate | 6 (10,9%) (a) | 14 (15,6%) (a) | 25 (11,9%) (a) | |
| Severe | 4 (7,3%) (a) | 7 (7,8%) (a) | 5 (2,4%) (a) | |
| Very severe | 8 (14,5%) (a) | 16 (17,8%) (a) | 9 (4,3%) (b) | |

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Three separate analyses were conducted to assess the relative risk (RR) of depression, stress, and anxiety in CD and UC patients versus controls.

- Depression: Significantly increased risk (RR=1.54, 95% CI:1.17–2.02, p<0.01), indicating a 54% higher likelihood of depression in IBD patients. Both CD (RR = 1.47, 95% CI: 1.02–2.13, p=0.03) and UC (RR=1.58, 95% CI: 1.16–2.14, p<0.01) groups showed significantly higher risk compared to controls.
- Stress: Even more pronounced risk (RR=2.1, 95% CI: 1.54–2.87, p < 0.01), suggesting IBD patients are over twice as likely to experience severe stress. This pattern was consistent for both CD vs. control (RR = 1.99, p<0.01) and UC vs. control (RR=2.18, p<0.01).
- Anxiety: The overall increased risk did not reach statistical significance (RR=1.17, 95% CI: 0.97–1.42, p=0.1). CD patients (RR=1.11, p=0.42) showed no significant difference, while UC patients had a borderline increase (RR =1.21, 95% CI: 0.97–1.49, p = 0.07), not statistically significant.

### *3.5. Quality of Life (QOL) Analysis*

QOL scores (Table 5) revealed significant differences between CD, UC, and control groups, highlighting the burden of IBD on general well-being. Overall health, assessed via the EQ-VAS, was significantly lower in CD and UC patients compared to controls, with no difference between CD and UC groups. Anxiety/depression symptoms were absent in 49.1% of CD and 54.4% of UC patients, vs. 81.4% in controls (Table 5). Usual activities were unaffected in 56.4% (CD), 66.7% (UC), and 84.3% (controls), with significant differences between IBD groups and controls. Self-care was less impacted, but still showed significant group differences: 74.5% (CD), 77.8% (UC), and 89.5% (controls) reported no difficulties. Pain/discomfort was reported by 47.8% (CD), 52.2% (UC), and 21.4% (controls). Mobility was impaired in 21.8% (CD), 17.8% (UC), and 9.5% (controls), with significant differences overall, though UC vs. control was not statistically significant.

**Table 5.** Quality of Life Assessment in the Three Groups. (a) No significant difference between groups; (b) No significant difference between groups.

| | **CD (n=55)** | **UC (n=90)** | **Control (n=210)** | **P** |
|---|---|---|---|---|
| General Health Status | 76,16 (70,49 - 81,84) (a) | 79,72 (76,22 - 83,22) (a) | 90,31 (88,18 - 92,44) (b) | **<0,01** |
| Anxiety and Depression | | | | **<0.01** |
| I am not anxious or depressed | 28 (50,9%) (a) | 41 (45,6%) (a) | 141 (81,4%) (b) | |
| I am slightly anxious or depressed | 14 (25,5%) (a) | 25 (27,8%) (a) | 22 (10,5%) (b) | |
| I am moderately anxious or depressed | 8 (14,5%) (a) (b) | 14 (15,6%) (b) | 11 (5,2%) (a) | |
| I am severely anxious or depressed | 4 (7,3%) (a) | 6 (6,7%) (a) | 6 (2,9%) (a) | |
| I am extremely anxious or depressed | 1 (1,8%) (a) (b) | 4 (4,4%) (b) | 0 (0%) (a) | |
| Usual Activities | | | | **<0,01** |
| I have no problems doing my usual activities | 31 (56,4%) (a) | 60 (66,7%) (a) | 177 (84,3%) (b) | |
| I have slight problems doing my usual activities | 18 (32,7%) (a) | 21 (23,7%) (a), (b) | 27 (12,9%) (b) | |
| I have moderate problems doing my usual activities | 6 (10,9%) (a) | 8 (8,9%) (a) | 4 (1,9%) (b) | |
| I have severe problems doing my usual activities | 0 (0%) (a) | 1 (1,1%) (a) | 1 (0,5%) (a) | |
| I am unable to do my usual activities | 0 (0%) (a) | 0 (0%) (a) | 1 (0,5%) (a) | |
| Self-Care | | | | **0,02** |
| I have no problems washing or dressing myself | 41 (74,5%) (a) | 70 (77,8%) (a) | 188 (89,5%) (b) | |
| I have slight problems washing or dressing myself | 11 (20%) (a) | 16 (17,8%) (a) | 20 (9,5%) (a) | |

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| | | | | |
|---|---|---|---|---|
| I have moderate problems washing or dressing myself | 1 (1,8%) (a) | 1 (1,1%) (a) | 2 (1%) (a) | |
| I have severe problems washing or dressing myself | 2 (3,6%) (a) | 3 (3,3%) (a) | 0 (0%) (b) | |
| Pain and Discomfort | | | | **<0,01** |
| I have no pain or discomfort | 29 (52,7%) (a) | 43 *(47,8%) (a) | 165 (78,6%) (b) | |
| I have slight pain or discomfort | 13 (23,6%) (a), (b) | 31 (34,4%) (b) | 34 (16,2%) (a) | |
| I have moderate pain or discomfort | 11 (20%) (a) | 15 (16,7%) (a) | 7 (3,3%) (b) | |
| I have severe pain or discomfort | 2 (3,6%) (a) | 1 (1,1%) (a) | 4 (1,9%) (a) | |
| Mobility | | | | **0,015** |
| I have no problems walking | 43 (78,2%) (a) | 74 (82,2%) (a), (b) | 190 (90,5%) (b) | |
| I have slight problems walking | 9 (16,4%) (a) | 12 (13,3%) (a) | 16 (7,6%) (a) | |
| I have moderate problems walking | 3 (5,5%) (a) | 4 (4,4%) (a) | 3 (1,4%) (a) | |
| I have severe problems walking | 0 (0%) (a) | 0 (0%) (a) | 1 (0,5%) (a) | |

*3.6. Multivariate Analysis of Stress, Anxiety, and Depression Scores*

To confirm the robustness of univariate results, multiple linear regression models were developed to predict depression, anxiety, and stress scores based on disease group, adjusted for demographic, behavioral, and biological predictors. The Durbin-Watson statistic ranged from 1.7–1.8 across models, indicating no significant autocorrelation. All variance inflation factors were near 1, suggesting no multicollinearity.

For stress, the model explained 21.0% of score variability ($R^2$=0.210, adjusted $R^2$=0.160, p<0.01). Significant predictors of higher stress included UC, CD, female gender, younger age, corticosteroid use, and better reported standard of living. Self-reported rest was associated with lower stress levels (Table 6).

**Table 6.** Multiple Linear Regression for Predicting the Square Root of Stress Score, Adjusted for Multiple Covariates.

| Variable | B- | CI 95% | p |
|---|---|---|---|
| Stress Score | 2.841 | (1.14, 4.54) | **<0.01** |
| UC vs. Control | 1.040 | (0.59, 1.49) | **<0.01** |
| CD vs. Control | 0.725 | (0.14, 1.31) | **0.015** |
| Female sex | 0.718 | (0.39, 1.05) | **<0.01** |
| Corticosteroid treatment | 0.438 | (-0.28, 1.16) | **0.023** |
| Smoking | 0.329 | (-0.01, 0.67) | 0.06 |
| Standard of living | 0.253 | (-0.08, 0.58) | **0.013** |
| Physical activity | 0.237 | (-0.09, 0.56) | 0.15 |
| Alcohol consumption | 0.129 | (-0.21, 0.47) | 0.45 |
| Reported hours of sleep | 0.107 | (-0.07, 0.28) | 0.24 |
| BMI | 0.005 | (-0.03, 0.04) | 0.75 |
| Relationship status | -0.003 | (-0.38, 0.37) | 0.98 |
| Age | -0.016 | (-0.027, -0.005) | **<0.01** |
| Education (years) | -0.044 | (-0.09, 0.01) | 0.08 |
| Urban residence | -0.063 | (-0.54, 0.41) | 0.79 |
| Special diet | -0.149 | (-0.75, 0.45) | 0.62 |
| Biologic treatment | -0.408 | (-0.91, 0.10) | 0.11 |
| Self-reported rest | -0.509 | (-0.84, -0.18) | **<0.01** |

For anxiety, the model explained 14.6% of the variance ($R^2$=0.146, adjusted $R^2$=0.103, p<0.01). Significant predictors of higher anxiety included UC, female gender, smoking , and higher BMI. Self-reported rest was associated with lower anxiety levels (Table 7).

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**Table 7.** Multiple Linear Regression for Predicting the Square Root of Anxiety Score, Adjusted for Multiple Covariates.

| Variable | B- | CI 95% | p |
|---|---|---|---|
| Anxiety Score | 2.521 | (0,736 - 4,306) | **<0,01** |
| UC vs. Control | 0.686 | (0.22 - 1.15) | **<0.01** |
| CD vs. Control | 0.527 | (-0.09 - 1.14) | 0.09 |
| Female sex | 0.527 | (0.19 - 0.86) | **<0.01** |
| Smoking | 0.509 | (0.15 - 0.87) | **<0.01** |
| Corticosteroid treatment | 0.396 | (-0.36 - 1.16) | 0.3 |
| Alcohol consumption | 0.177 | (-0.18 - 0.54) | 0.32 |
| Special diet | 0.158 | (-0.48 - 0.79) | 0.62 |
| Reported hours of sleep | 0.128 | (-0.06 - 0.32) | 0.18 |
| Physical activity | 0.067 | (-0.28 - 0.41) | 0.7 |
| Relationship status | 0.048 | (-0.35 - 0.45) | 0.81 |
| Standard of living | 0.043 | (-0.31 - 0.40) | 0.8 |
| Age | -0.006 | (-0.02 - 0.01) | 0.34 |
| BMI | -0.009 | (-0.04 - 0.02) | 0.6 |
| Education (years) | -0.046 | (-0.10 - 0.01) | 0.08 |
| Urban residence | -0.076 | (-0.57 - 0.42) | 0.76 |
| Biologic treatment | -0.472 | (-1.00 - 0.06) | 0.08 |
| Self-reported rest | -0.629 | (-0.98 - -0.28) | **<0.01** |

For depression, the model explained 17.3% of score variability ($R^2$=0.173, adjusted $R^2$=0.132, p<0.02), indicating a moderate effect. Key predictors of higher depression included UC and female gender. Age was inversely associated with lower depression levels. Self-reported rest significantly reduced depression (Table 8).

**Table 8.** Multiple Linear Regression for Predicting the Square Root of Depression Score, Adjusted for Multiple Covariates.

| Variable | B- | CI 95% | p |
|---|---|---|---|
| Depression Score | 2,764 | (0,740 – 4,788) | **<0,01** |
| UC vs. Control | 0,812 | (-0,284 – 1,340) | **<0,01** |
| Female sex | 0,642 | (0,256 – 1,027) | **<0,01** |
| Corticosteroid treatment | 0,523 | (-0,331 -1,376) | 0,22 |
| Biologic treatment | 0,493 | (-0,109 – 1,096) | 0,1 |
| Physical activity | 0,350 | (-0,042 – 0,742) | 0,08 |
| CD vs. Control | 0,321 | (-0,374 – 1,016) | 0,36 |
| Smoking | 0,158 | (-0,253 – 0,569) | 0,44 |
| Reported hours of sleep | 0,112 | (-0,102 – 0,326) | 0,3 |
| Relationship status | 0,051 | (-0,394 – 0,496) | 0,82 |
| Urban residence | 0,019 | (-0,544 – 0,583) | 0,94 |
| Standard of living | 0,017 | (-0,378 – 0,413) | 0,93 |
| BMI | -0,005 | (-0,042 – 0,032) | 0,8 |
| Age | -0,016 | (-0,029 - -0,002) | **0,021** |
| Alcohol consumption | -0,035 | (-0,439 – 0,369) | 0,86 |
| Education (years) | -0,056 | (-0,116 – 0,004) | 0,06 |
| Special diet | -0,480 | (-1,202 – 0,242) | 0,19 |
| Self-reported rest | -0,817 | (-1,217 – -0,417) | **<0,01** |

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## 4. Discussion

The study successfully met its goal of collecting over 100 questionnaires per group. However, all groups showed suboptimal questionnaire completion, possibly reflecting limited participant engagement, perhaps due to the lack of incentives.

An interesting observation was that over half of UC patients reported alcohol consumption, with significant differences even compared to CD patients. This could influence mental health, warranting more detailed investigation in future studies. Complications were more frequent in CD patients, reflecting greater disease severity. Anxiety, depression, and stress scores from DASS-21 were significantly higher in both IBD groups compared to controls, but not between CD and UC, aligning with prior literature [11–16] and the study's aims.

DASS-21 findings confirmed a high prevalence of psychological symptoms in IBD, consistent with existing evidence. Stress scores showed a notably higher proportion of severe and very severe cases in IBD groups. This aligns with findings from Black et al. [15], who reported stress as a trigger for symptom exacerbation and lower quality of life in UC patients.

Regarding anxiety, while normal levels were comparable between groups, very severe anxiety was significantly more prevalent in IBD patients. Overall, findings highlight the psychological burden of IBD, supporting the need for early psychological interventions to improve disease management and quality of life. Moreover, stressful external situations such as the COVID-19 pandemic were associated with a significant decline on mental health and high levels of anxiety in individuals with IBD underscores the importance of healthcare strategies during global crises [17].

Quality of life analysis showed poorer general health in IBD patients, unsurprising given the disease burden and contributing factors like marital status and rest quality. IBD patients more frequently reported emotional issues, reduced ability to perform daily activities, impaired self-care and mobility, and more frequent pain/discomfort.

Multivariate analysis aimed to identify predictors of stress, depression, and anxiety. Self-reported rest was a protective factor across all outcomes. Biologic treatment was linked to lower stress and anxiety scores but had an inverse relationship with depression, potentially due to hidden medication effects or masking. Paradoxically, better standard of living was associated with higher stress and anxiety, though not significantly. A slightly increased depression risk was also observed. This might relate to higher responsibilities or expectations associated with affluence. Alcohol consumption was linked to lower stress and anxiety but higher depression scores, though not statistically significant. Smoking emerged as a risk factor for all psychological outcomes, consistent with literature noting its adverse effects on IBD progression [18,19]. Paradoxically, more reported sleep hours were associated with higher psychological scores. However, perceived rest was a strong protective factor, underscoring sleep quality over quantity, in line with previous studies [20].

Participant recruitment was challenging due to reluctance and incomplete questionnaires, limiting full engagement. A final limitation was the lack of disease activity data, preventing stratification of IBD patients into active vs. remission phases.

## 5. Conclusions

This study provides valuable insights into the prevalence of stress, depression, and anxiety in IBD patients, emphasizing the need for regular screening.

Psychological disorders are more frequent in IBD populations compared to controls. Sleep quality emerged as an important predictor, meriting focus in future interventional research.

Future studies should prioritize longitudinal designs, standardized assessment protocols for psychological distress, and deeper exploration of sleep quality to clarify affective patterns in IBD and guide targeted interventions.

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