

Psychological Comorbidities in Inflammatory Bowel Disease: Assessing the Link between Anxiety, Depression, Disease Severity, and Duration

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Abstract

Background: Inflammatory Bowel Disease (IBD), which includes ulcerative colitis (UC) and Crohn's disease (CD), is a long-lasting gastrointestinal condition that often brings along psychological challenges. This study set out to assess how common anxiety and depression are among Indian patients with IBD, while also looking into how these issues relate to the type of disease, its severity, how widespread it is, how long it's been present, and the treatments being used.

Methods: We conducted a cross-sectional study involving 100 IBD patients (87 with UC and 13 with CD) at a specialized care center. To evaluate their mental health, we used the Hamilton Anxiety Rating Scale (HAM-A) and the Hamilton Depression Rating Scale (HAM-D). We also examined various clinical factors, such as disease type, extent, severity, duration, and the use of steroids, to see how they correlated with mental health issues.

Results: In our study group (with a male-to-female ratio of 1.3:1), we found that 30% of participants showed signs of depression, while 15% exhibited symptoms of anxiety. Interestingly, we didn't find a significant link between mental health issues and the type of IBD, the extent of the disease in UC, its severity, or how long it had been present. However, patients with stricturing CD had notably higher rates of depression and anxiety compared to those with non-stricturing, non-penetrating CD, although this finding is somewhat limited due to the small number of CD patients (n=13). We also noted that patients on corticosteroids reported higher levels of psychiatric symptoms, but this wasn't statistically significant.

Conclusion: Depression and anxiety are prevalent among Indian IBD patients, highlighting the psychological toll that chronic inflammatory diseases can take. It's crucial to incorporate routine mental health screenings at the time of diagnosis and to consider early psychiatric referrals as part of the overall management of IBD.

Keywords: Inflammatory Bowel Disease, Ulcerative Colitis, Crohn's Disease, Depression, Anxiety, Psychiatric Comorbidity.

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Introduction

Inflammatory bowel disease (IBD), which includes ulcerative colitis (UC) and Crohn's disease (CD), is a collection of chronic gastrointestinal disorders that tend to come and go. These conditions are getting more attention worldwide, not just because more people are being diagnosed, but also due to the significant impact they have on patients' mental health. While IBD has traditionally been more common in Western countries, we're now seeing a rise in cases in newly industrialized areas like Asia, Africa, and Latin America, including India, where the rates of UC and CD are reported to be between

4.98–7.71 and 3.77–6.38 per 100,000 person-years, respectively [1,2]. Living with chronic illnesses like IBD, which require ongoing management and currently have no cure, can take a heavy toll on mental health. The unpredictability of flare-ups, frequent relapses, and a declining quality of life can lead to feelings of helplessness and a sense of losing control—key signs of depression as outlined in Seligman's theory of learned helplessness. The connection between IBD and mental health issues is becoming more recognized, with increasing evidence pointing to the gut-brain axis as a key

player in this relationship. Disruptions in the hypothalamic-pituitary-adrenal (HPA) axis, the autonomic nervous system, and the gut microbiome are thought to contribute to both gastrointestinal inflammation and psychological symptoms like anxiety and depression [3,4].

Psychiatric comorbidities are often seen in individuals with inflammatory bowel disease (IBD), with anxiety and depression being the most frequently reported issues. Research, including meta-analyses and cohort studies from various parts of the world, consistently indicates that people with IBD are much more likely to face mood and anxiety disorders compared to the general population.

Some studies even suggest that those with IBD are three to five times more prone to developing anxiety disorders and two to four times more likely to experience depression throughout their lives [5]. It's estimated that anxiety symptoms can affect up to one-third of IBD patients, while depressive symptoms may impact around a quarter of them. These figures tend to be higher during active disease phases, hinting at a possible link between disease activity and psychological distress. Additionally, factors like disease severity, frequent flare-ups, and socio-economic challenges have been identified as significant risk factors for psychiatric complications [6,7].

Despite the wealth of international data, there's still a noticeable lack of research on the psychological impact of IBD in India. A study conducted in Mumbai, which included both IBD patients and healthy controls, found a notable prevalence of depression (34.2%) and anxiety (18.6%) among the patient group [8]. Given these findings and the rising incidence of IBD in India, there's a clear need for further research to better understand the relationship between psychological comorbidities and factors like disease severity and duration.

This study aims to delve into the prevalence of anxiety and depression among IBD patients and examine how these issues correlate with clinical characteristics, ultimately contributing to a deeper understanding of the connection between mental health and chronic gastrointestinal diseases.

Methodology

Study Design and Setting

This study was a descriptive cross-sectional analysis carried out over two years, from August 2022 to July 2024, in the Department of Gastroenterology at SCB Medical College and Hospital in Cuttack.

The aim was to explore how common anxiety and depression are among patients with inflammatory bowel disease (IBD) and to look into how these

psychological issues relate to the severity and duration of the disease.

Study Population

We recruited 100 consecutive patients diagnosed with IBD, which included both ulcerative colitis (UC) and Crohn's disease (CD), from the hospital's outpatient and inpatient departments. Each diagnosis was confirmed through endoscopic evaluations and histopathological findings. Participants were between 18 and 60 years old and had at least a fifth-grade education to ensure they could understand and complete the study questionnaires. We excluded patients with pre-existing psychiatric disorders or other health issues that could impact mental health, to avoid any potential confounding factors.

Sampling and Sample Size Calculation

To determine the sample size, we used the formula $n = z^2P(1-P)/d^2$, based on a previous study in Mumbai that found a 53% prevalence of anxiety and depression in IBD patients. With this estimate, a 10% margin of error, a 95% confidence interval, and 90% power, we calculated the final sample size to be 100. We enrolled patients who met the inclusion criteria consecutively until we reached the required number.

Assessment Tools and Data Collection

We assessed all participants for signs of depression and anxiety using standardized tools. The Patient Health Questionnaire-9 (PHQ-9) served as our main screening method for depression. If someone scored 10 or higher on the PHQ-9, it indicated a positive screen, leading us to conduct a more detailed evaluation with the Hamilton Depression Rating Scale (HAM-D) to determine the severity. The HAM-D categorizes depression severity into four levels: no depression (0–7), mild (8–16), moderate (17–23), and severe (≥ 24).

For anxiety, we used the Symptom Checklist Anxiety Scale (SCL-A20), which is a shorter version of the Symptom Checklist-90-R. A score of 29 or above was set as the threshold for diagnosing anxiety, especially considering the potential for mixed anxiety and depression in this group.

Patients who scored above this threshold were further assessed using the Hamilton Anxiety Rating Scale (HAM-A), which classifies anxiety severity as no anxiety (0–5), mild (6–14), moderate (15–28), and severe (≥ 29). These assessments were carried out through self-administered questionnaires in the language preferred by the patient, with appropriate guidance provided.

Disease Severity Assessment

To measure the clinical severity of Inflammatory Bowel Disease (IBD), we used disease-specific

activity indices. For patients with Ulcerative Colitis (UC), we applied the Mayo scoring system, which ranges from mildly active (3–5) to moderately active (6–10) and severely active disease (11–12). For those with Crohn's Disease (CD), we utilized the Crohn's Disease Activity Index (CDAI). CDAI scores are interpreted as follows: 0–149 indicates remission, 150–220 suggests mild to moderate activity, 221–450 points to moderate to severe activity, and scores above 450 indicate severely active to fulminant disease.

Clinical and Laboratory Evaluation

In the Clinical and Laboratory Evaluation phase, we gathered baseline clinical data, which included details like disease duration, symptoms, current treatment plans, and any previous surgeries. We also collected laboratory parameters, such as complete blood counts and C-reactive protein (CRP) levels, following standard lab procedures. If necessary, we carried out additional tests like stool examinations, abdominal X-rays, or colonoscopies. To assess the extent of the disease in ulcerative colitis (UC) and the location and behavior of the disease in Crohn's disease (CD), we utilized the Montreal classification system.

Statistical Analysis

For the Statistical Analysis, we entered all the data into Microsoft Excel and analyzed it using SPSS version 27.0 and GraphPad Prism version 5. Continuous variables were summarized with means and standard deviations, while categorical variables were shown as counts and percentages. We compared groups using independent t-tests for continuous variables and Chi-square or Fisher's exact tests for categorical variables, depending on what was appropriate. A p-value of 0.05 or less was deemed statistically significant. T-tests were conducted under standard assumptions, and we interpreted p-values based on the t-distribution, using the relevant degrees of freedom to assess significance.

Ethical Considerations

Regarding Ethical Considerations, we secured ethical clearance from the Institutional Ethics Committee of SCB Medical College and Hospital in Cuttack, with application number 1517/23.11.2023, before starting the study. We made sure to obtain informed consent from all participants prior to their enrollment, and all procedures adhered to the ethical standards set by both institutional and national research committees.

Result

Table 1: Prevalence of Psychological Comorbidities and Key Associations

Variable	Category	Anxiety (n=15)	Depression (n=30)	p-value
Overall Prevalence	—	15 (15.0%)	30 (30.0%)	—
By Disease Type	Ulcerative Colitis (UC)	13 (14.9%)	27 (31.0%)	0.61
	Crohn's Disease (CD)	2 (15.4%)	3 (23.1%)	
CD Behavior	Non-stricturing (B1)	0 (0.0%)	1 (12.5%)	0.014
	Stricturing (B2)	2 (40.0%)	4 (80.0%)	
UC Severity (Mayo)	Mild/Moderate	8 (10.7%)	20 (26.7%)	0.238
	Severe	5 (41.7%)	7 (58.3%)	
Steroid Use	Users	5 (38.5%)	4 (30.8%)	0.051*
	Non-users	10 (11.5%)	26 (29.9%)	

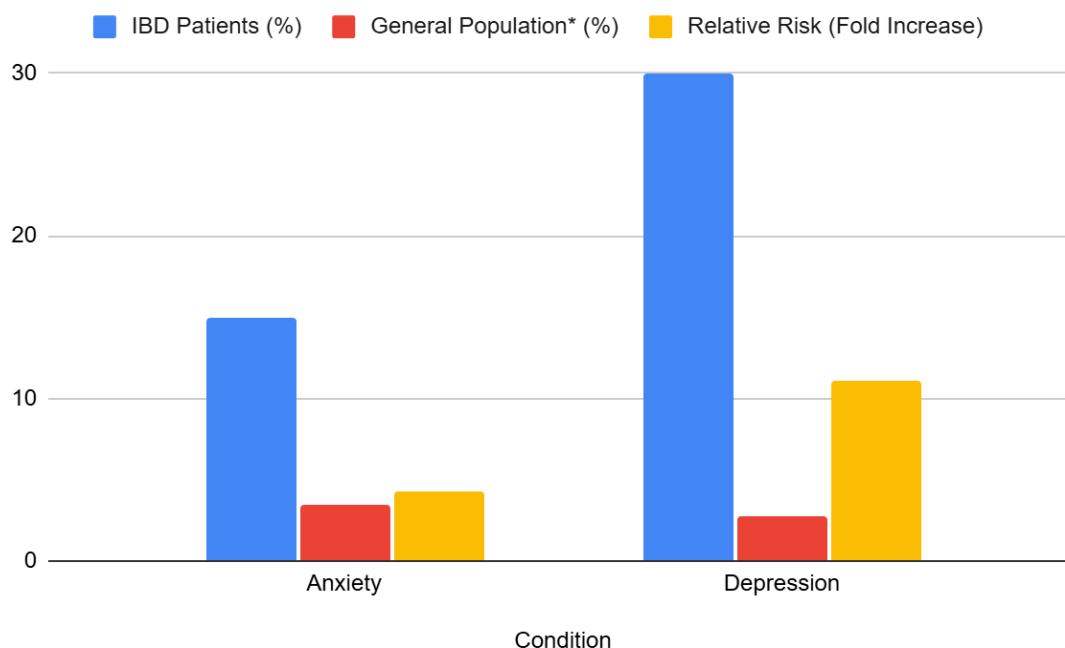
HAM-A comparison (steroid users: 42.4 ± 6.4 vs. non-users: 21.5 ± 15.0).

Table 2: Demographic and Clinical Correlates of Psychological Symptoms

Parameter	Anxiety (HAM-A)	Depression (HAM-D)
Disease Duration	$r = 0.624$ ($p=0.063$)	$r = 0.101$ ($p=0.594$)
UC Extent (Montreal)	$r = 0.239$ ($p=0.432$)	$r = -0.332$ ($p=0.091$)
UC Severity (Mayo)	$r = 0.413$ ($p=0.161$)	$r = -0.208$ ($p=0.298$)
Age	NS ($p=0.187$) [†]	NS ($p=0.187$) [†]
Gender	NS ($p=0.112$)	NS ($p=0.112$)

Psychiatric illness prevalence highest in 31–40 years (60.7%, $n=17/28$) but not statistically significant.

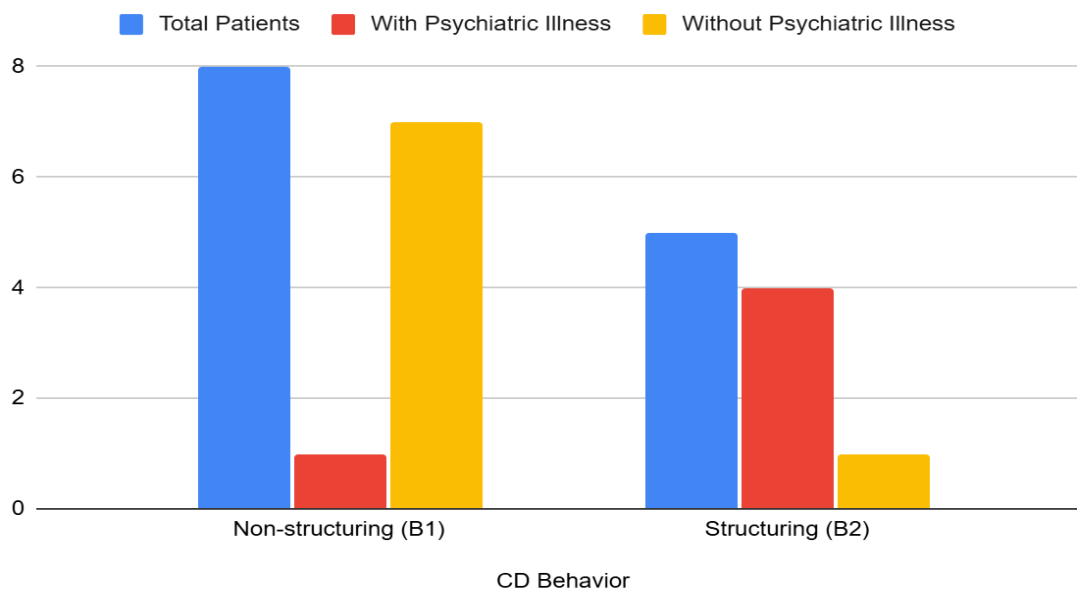
NS: Not significant ($p>0.05$); r: Pearson correlation coefficient.



Graph 1: Prevalence of Anxiety and Depression in IBD vs. General Population

Patients with IBD showed significantly higher rates of psychological issues compared to those in the general population. For instance, anxiety impacted 15.0% of IBD patients, while only 3.5% of the general population experienced it. Similarly, the

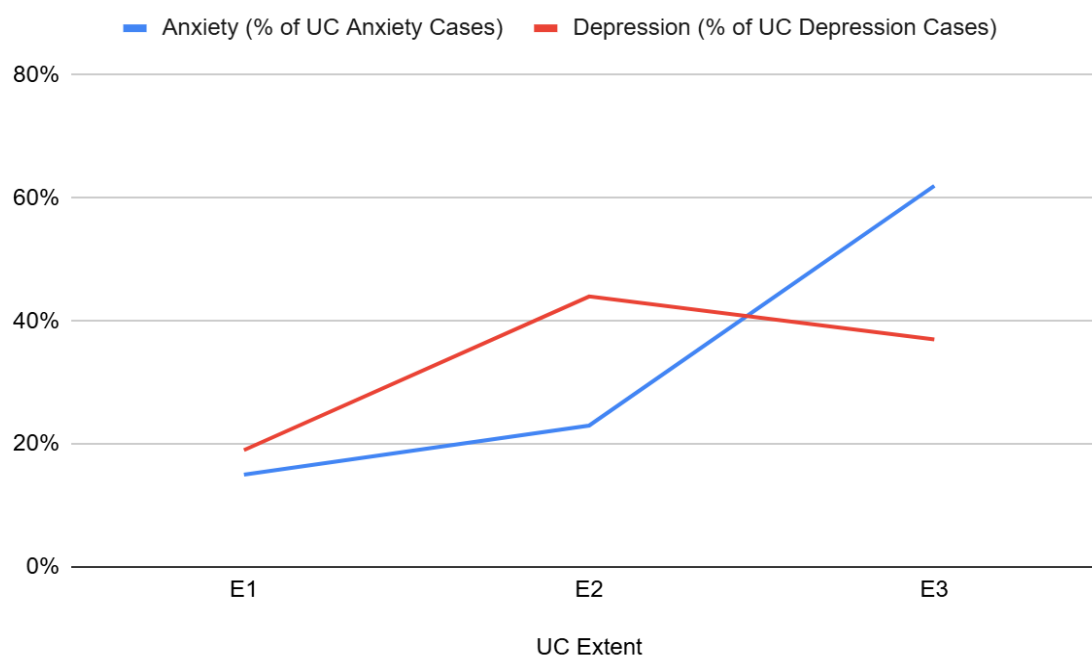
prevalence of depression was 30.0% among IBD patients, compared to just 2.7% in the general population. This highlights a staggering 4.3-fold increase for anxiety and an 11.1-fold increase for depression [Graph 1].



Graph 2: Psychiatric Illness by Crohn's Disease Behavior

Stricturing Crohn's Disease (B2) has been linked to a notable increase in psychiatric issues, with a p-value of 0.014. A striking 80% of patients with B2 reported experiencing depression, while 40%

mentioned feelings of anxiety. On the other hand, those with non-stricturing Crohn's Disease (B1) seemed to face much less psychological distress [Graph 2].



Graph 3: Anxiety and Depression Distribution by UC Extent

Anxiety was found to be most common in those with extensive ulcerative colitis (E3: 62.0%), while depression was highest in patients with left-sided disease (E2: 44.0%). Interestingly, the links between the extent of the disease and the severity of symptoms (measured by HAM-A/HAM-D) didn't show any significant correlation [Graph 3].

The study uncovered some important trends regarding psychological comorbidities in patients with inflammatory bowel disease (IBD). It found that those using steroids had significantly higher anxiety scores (mean HAM-A: 42.4 compared to 21.5, $p=0.051$), but there wasn't a notable effect on depression scores. Disease behavior played a key role, with patients suffering from stricturing Crohn's disease (B2) facing a psychiatric illness risk that was 6.4 times greater than those with non-structuring disease (B1, $p=0.014$).

Interestingly, no significant links were found between psychiatric comorbidities and demographic factors like age, gender, or the type of IBD (ulcerative colitis vs. Crohn's disease).

When looking at symptom relationships, a positive correlation was noted between the severity of anxiety and longer disease duration ($r=0.624$, $p=0.063$), while depression appeared to have an inverse relationship with the extent of ulcerative colitis ($r=-0.332$, $p=0.091$). Overall, these findings highlight the urgent need for integrated psychological screening in managing IBD, especially for patients with stricturing Crohn's disease or those on steroid treatment.

Discussion

Inflammatory Bowel Disease (IBD) is a chronic condition that often flares up and then subsides, and it has been linked to various psychiatric issues for quite some time. The current study, carried out at SCB Medical College in Cuttack from June 2022 to July 2024, is one of the first to take a close look at how common anxiety and depression are among IBD patients in India, using structured assessments like the HAM-A and HAM-D. Out of the 100 patients involved in the study, 15% were found to have anxiety, while 30% were dealing with depression, highlighting a significant psychological toll.

These results are particularly striking when you consider the general Indian population, where the National Mental Health Survey (NMHS, 2016) found that only 3.5% experience anxiety and 2.7% face depression. This means that IBD patients are experiencing anxiety at a rate 4.3 times higher and depression at an astonishing 11.1 times higher than the general population, shining a light on the severe psychological impact of living with IBD.

Our findings are in line with what previous studies have shown. For example, Bhamre et al. [9] (2018) found that 18.6% of a similar Indian IBD cohort experienced anxiety, while 34.2% dealt with depression. On a global scale, both Bernstein et al. [10] and Häuser et al. [11] have reported higher rates of psychiatric disorders in IBD patients compared to the general population, highlighting that this is a widespread concern.

That said, the prevalence of these issues can differ depending on the type of disease. In our research, we discovered that patients with stricturing Crohn's Disease (B2) had a notable link to both anxiety and depression ($p=0.014$), with a staggering 80% of B2 patients reporting feelings of depression—this is a 6.4-fold increase compared to those with non-stricturing CD. This backs up earlier findings that suggest it's the behavior of the disease, rather than just its type (like UC vs. CD), that plays a significant role in psychological risk.

Interestingly, unlike some previous studies, we didn't find a significant connection between demographic factors such as age and gender with anxiety or depression in our group ($p>0.05$). While the 31–40 age group showed the highest prevalence of psychiatric illness at 60.7%, it didn't reach statistical significance.

We also noticed a positive correlation between the duration of the disease and the severity of anxiety ($r=0.624$, $p=0.063$), hinting at a trend where psychological distress may increase over time. This aligns with findings from Kurina et al. [12] and Bhamre et al. [9], although our study didn't find a significant link between depression and disease duration ($r=0.101$, $p=0.594$). These details underscore the ongoing stress and cumulative challenges of living with IBD.

When it comes to disease severity, patients with severe UC showed higher scores for anxiety and depression, but again, these findings didn't reach statistical significance (HAM-A: $p=0.161$; HAM-D: $p=0.298$). These patterns are consistent with Vanderminden [13], who found a relationship between Mayo scores and psychological distress, though often with limited statistical power in smaller groups.

Steroid use has been identified as a possible factor contributing to psychological symptoms. Patients taking steroids showed notably higher scores on the HAM-A scale (mean 42.4 compared to 21.5, $p=0.051$), indicating a strong link to anxiety, even though the comparisons in prevalence didn't quite reach statistical significance ($p=0.135$). This could be due to both the direct neuropsychiatric effects of corticosteroids and the indirect impact of active disease flares. Previous research, including that by Bhamre et al. [9], has observed similar patterns, highlighting the importance for clinicians to consider these psychological side effects when planning treatment.

Interestingly, extensive ulcerative colitis (E3) was linked to higher anxiety levels (62%), while left-sided ulcerative colitis (E2) was associated with increased depression (44%). However, no significant correlation was found between the extent of the disease and the severity of symptoms

(HAM-A: $r=0.239$, $p=0.432$; HAM-D: $r=-0.332$, $p=0.091$). These results echo the findings of Bhamre et al. [9], suggesting that while the extent of the disease may affect the overall burden, its influence on mental health is quite complex and multifaceted.

Among the three patients with a history of abdominal surgery, all were diagnosed with depression. Although the small sample size limits statistical analysis, this observation aligns with existing literature indicating that surgery—often seen as a sign of severe disease—can worsen psychiatric issues.

This study contributes to the growing evidence that underscores the necessity for regular psychological screening in the care of inflammatory bowel disease (IBD). Despite the evident impact of mental health on how patients perceive their disease, adhere to treatment, and maintain their quality of life, very few patients actually utilize psychological services, as highlighted in the UK IBD Audit (2014) and the Dutch KLC study. Incorporating psychiatric evaluations into standard IBD management, particularly for patients on steroids, those with stricturing Crohn's disease, or those with a longer disease duration, could lead to significantly better outcomes [14].

This study highlights several impressive strengths. For starters, it boasts a solid sample size ($n=100$), especially when it comes to ulcerative colitis (UC) patients, which really boosts the reliability of the findings for this particular group. The research employs validated psychiatric assessment tools, like the Hamilton Anxiety Rating Scale (HAM-A) and the Hamilton Depression Rating Scale (HAM-D), which adds a layer of methodological rigor and ensures that psychological comorbidities are measured accurately. Plus, the focus on an underrepresented Indian population helps fill a significant gap in the current literature on inflammatory bowel disease (IBD) within Asian contexts [15].

That said, the study does have its limitations. The small number of Crohn's disease (CD) patients ($n=13$) makes it tough to conduct meaningful subgroup analyses within this cohort. Additionally, since it's a single-center study carried out in a tertiary care setting, the findings may not be easily applicable to broader, community-based populations. Lastly, the cross-sectional design means we can't draw any conclusions about causality between IBD and psychiatric symptoms.

IBD significantly heightens the risk of anxiety and depression, regardless of demographic factors. Psychological distress is particularly severe in patients with stricturing Crohn's disease and those on corticosteroids. Given the chronic and relapsing

nature of IBD, integrating mental health services into routine care isn't just a suggestion—it's absolutely essential.

Conclusion

In conclusion, this study sheds light on the heavy toll that psychiatric comorbidities take on individuals with Inflammatory Bowel Disease (IBD). It turns out that about 30% of patients struggle with depression, while 15% deal with anxiety. Interestingly, these mental health challenges don't seem to be linked to the type of disease (whether it's ulcerative colitis or Crohn's disease), how extensive it is, how severe it gets, or how long it lasts. However, those with stricturing Crohn's disease do show a higher rate of anxiety and depression compared to patients with non-stricturing, non-penetrating forms, although the small number of participants makes it hard to draw broad conclusions. While more intense psychiatric symptoms were noted more often in patients receiving steroid treatment, the difference wasn't statistically significant. Given these insights, it's crucial to implement routine mental health screenings when diagnosing IBD and to make timely psychiatric referrals to provide well-rounded care for these patients.

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