College of Health Science

School of Medicine

Department of Internal Medicine

Prevalence of Anxiety and Depression symptoms among patients with Inflammatory Bowel Disease: A Multicenter Study

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Abstract

Background: Global evidences have observed that individuals with Inflammatory Bowel Disease (IBD) are at a heightened risk of experiencing psychiatric disorders, which often coincide with a decrease in their quality of life

Objective: To assess the prevalence of anxiety and depression symptoms and associated factors among patients with Inflammatory Bowel Disease at Tikur Anbessa Specialized Hospital and Adera Medical Center, Addis Ababa, Ethiopia from June to September, 2023

Methods: Institutional based cross-sectional study was conducted at Tikur Anbesa Specialized Hospital and Adera Medical Center. Simple random sampling was used to select 118 patients. The categorical variables in the study were presented using frequency and percentage, and compared between groups using the chi-square test. The normal distribution of the continuous variables was assessed using Shapiro-ilk test. The mean and standard deviation was calculated for normality distributed data while median and interquartile range calculated for skewed data. A univariate and multivariate binary logistic regression analysis was performed to examine the factors associated with Depression and Anxiety symptoms in IBD patients. The results of logistic regression were reported as adjusted odds rations (OR) with 95% confidence intervals and p-value < 0.05 considered statistically significant.

Results: An analysis of 118 patients was conducted, revealing a median age of 33 years with an interquartile range of 12.5 years. Among the participants, 67.8% were female, and 53.4% were employed. The study revealed a 5.1% prevalence of anxiety symptoms and 7.1% prevalence of depressive symptoms among individuals with IBD. After adjusting for multiple variables in the multivariate analysis, it was found that moderate disease activity (AOR=16.1(1.7,156.7), p=0.015) and severe disease activity (AOR=49.8(2.1,1144.02), p=0.014) had a statistically significant association with increased rates of depressive symptoms in IBD patients. However, smokers (AOR=1.6(0.15,17.22), p=0.053) and those with a disease duration of less than 4 years (AOR=1.6(0.49, 17.2), p=0.07) also showed a positive association with the development of significant depressive symptoms, though these associations did not reach statistical significance. In addition, the study ascertained that moderate disease activity (AOR=9.9, 95% CI: 0.9, 106.2, p=0.058) had positive association while severe disease activity (AOR=45.3, 95%CI: 2.0, 1018.0, p=0.016) emerged as a statistically significant associated factor with having anxiety symptoms.

Conclusion: The prevalence of anxiety and depressive symptoms in this study were generally low, but can increase due to important factors such as disease activity, smoking, unemployment, a short duration after diagnosis, and having ulcerative IBD

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Table and Figure list

ACRONYMS

AAU	Addis Ababa University
IBD	Inflammatory bowel disease
UC	Ulcerative colitis
CD	Crohn's disease
PHQ-9	Patient health quessionairre-9
GAD-7	Generalized anxiety disorder-7
TASH	Tikur Anbesa Specialized Hospital
GI unit	Gastroenterology unit
HADS	Hospital anxiety and depression scale
MOH	Ministry of Health
EFY	Ethiopian fiscal year
ISSEO cohort	Impact de la Situation Socio Économique sur l'Observance cohort
PI	Principal investigator

CHAPTER ONE: INTRODUCTION

1.1. Background

Inflammatory bowel disease (IBD) is a chronic medical illness which has contributed to a significant burden on global mortality, morbidity, and disability worldwide(1). The pathogenesis of inflammatory bowel disease (IBD), which includes ulcerative colitis (UC) and Crohn's disease (CD), is complex and multifactorial. Genetic susceptibility, environmental triggers, alterations in the gut microbiome, and dysregulated immune responses all play a role in the development and progression of these chronic inflammatory conditions(2, 3). The primary treatment approaches for inflammatory bowel disease (IBD) consist of immunomodulators, biologics, and monoclonal antibodies like anti-integrins and anti-interleukins. Starting treatment early can prevent relapses and complications, reduce the risk of malignancy and infections, enhance quality of life, and lessen the occurrence of psychiatric disorders associated with IBD(4). Inflammatory bowel disease (IBD) profoundly affects individuals' quality of life through increased rates of psychiatric disorders(5-7), medical related complaints, and medical cost. Research from around the world indicates that individuals with inflammatory bowel disease (IBD) experience notably higher rates of depression and anxiety compared to the general population(6-9). These psychiatric disorders linked to IBD have been shown to diminish quality of life, complicate the treatment of the disease, reduce medication adherence, and heighten the occurrence of active disease(9). Screening and monitoring the psychological disorders in patients with IBD play significant role in both primary care and specialist settings. Unfortunately, no IBD specific instruments to measure anxiety or depression disorders have been validated to date. One approach to determine anxiety and depression is to use existing screening measures that have established reliability and effectiveness, which are easy to score and can be coded into electronic medical records. One of these tools are the Generalized Anxiety Disorder Scale (GAD-7)(10) and Patient Health Questionnaire (PHQ-9)(11); which are multipurpose, self-reported screening tools; validated and found reliable for use in screening, monitoring, and measuring the severity of anxiety and depressive symptoms.

1.2. Statement of the problem

Inflammatory Bowel Disease (IBD) has emerged as a substantial contributor to global mortality, morbidity, disability, and diminished quality of life. It's a prevalent disease, affecting an estimated 4.9 million individuals globally in 2019(1, 2). Although traditional belief suggested that inflammatory bowel disease (IBD) primarily affected Western populations, recent evidence indicates a projected exponential rise in the number of IBD cases in low- and middle-income countries, potentially reaching levels seen in the Western world by 2025 as a result of population growth (12). (4). Inflammatory bowel disease (IBD) profoundly affects individuals' quality of life through increased rates of psychiatric disorders(5-7), medical related complaints, and medical cost. Global evidences have observed that individuals with Inflammatory Bowel Disease (IBD) are at a heightened risk of experiencing psychiatric disorders, which often coincide with a decrease in their quality of life(13). It has been observed that psychiatric disorders are 1.5–2 times more common in individuals with Inflammatory Bowel Disease (IBD) compared to the general population. Evidences from a meta-analysis of 171 studies total of 158,371 participants, it was found that approximately 35% of IBD patients experienced symptoms of anxiety while 22 % reported symptoms of depression(6, 9). Another extensive global evidence, in a meta-analysis of 58 observational studies, it was discovered that the pooled prevalence of anxiety symptoms was roughly 32%, and in a meta-analysis of 75 observational studies, the combined prevalence of depression symptoms was 25%(8, 9). These psychiatric disorders linked to IBD have been shown to diminish quality of life, complicate the treatment of the disease, reduce medication adherence, and heighten the occurrence of active disease(9). Global evidence also indicates that IBD is a costly medical condition, with annual medical costs estimated to exceed $6 billion in the USA and over 5.6 billion euros in Europe(12). The epidemiological statistics for Inflammatory Bowel Disease (IBD) highlight the need of collaborative efforts of global, regional, and national level on healthcare access, equitable distribution of medication, advancements in treatment, and initiatives to improve quality of life.

1.3. Significance of the study

The findings of this study are important for health care providers to understand the significance of inflammatory bowel disease (IBD) in terms of its impact on mental health. It helps in providing better care, timely interventions, and personalized treatment plans for IBD patients, thereby enhancing patient outcomes and satisfaction. This study also provides an input for policy makers to recognize the burden of depression and anxiety symptoms among IBD patients and hence shape the healthcare policies and allocate resources accordingly. By understanding the burden of these psychiatric symptoms among IBD patients; policy makers can develop strategies to improve access to care, enhance healthcare infrastructure, fund research initiatives, and implement measures to promote early detection and effective management of these symptoms among IBD patients within healthcare systems. The study also provides evidences for health equity care advocators to advocate on addressing disparities in healthcare access and outcomes among different populations. Recognizing the impact of IBD on mental health is essential in advocating for equitable access to care for all individuals affected by IBD. The finding of this study will allow clinicians to understand the burden of mental health problems in IBD patients; their substantial contribution to morbidity, disability, and diminished quality of life. Lastly, it will also help researchers to focus on exploring novel treatment approaches, identifying risk factors, and developing interventions that can improve outcomes in this group of population. This broader perspective can guide research efforts towards addressing key challenges and advancing holistic knowledge in the field of IBD management and care.

CHPTER TWO: LITERATURE REVIEW

2.1. Burden of Inflammatory Bowel Disease (IBD)

Inflammatory Bowel Disease (IBD) has emerged as a substantial contributor to global mortality, morbidity, disability, and diminished quality of life. It's a prevalent disease; affecting an estimated 4.9 million individuals globally in 2019(1, 2). The distribution and occurrence of IBD have shown diversity based on geographical and other influencing factors. While IBD was historically associated with Western countries, recent researches has revealed a significant rise in incidence rates in newly industrialized regions such as the Middle East, Asia, and South America over the past three decades (14). In contrast, the incidence of IBD in Western nations seems to have

stabilized in the 21st century(12, 15). The highest prevalence rates were reported in Europe, with ulcerative colitis at 505 per 100,000 in Norway and Crohn's disease at 322 per 100,000 in Germany. In North America, the prevalence rates were also high, with ulcerative colitis at 286 per 100,000 in the USA and Crohn's disease at 319 per 100,000 in Canada(14). In 2019, IBD was accountable for 41,000 deaths globally, marking a 69% increase(1). There was notable variation across regions, with Western Europe recording the highest number of deaths and the highest age-standardized death rate at 1.11 per 100,000 people(1). In 2019, IBD accounted for 1.62 million DALYs globally, with 0.73 million YLD and 0.90 million YLL, with significant variability among regions and countries(1). Global evidence indicates that IBD is a costly medical condition, with annual medical costs estimated to exceed $6 billion in the USA and over 5.6 billion euros in Europe(12). The epidemiological statistics for Inflammatory Bowel Disease (IBD) highlight the need of collaborative efforts of global, regional, and national level on healthcare access, equitable distribution of medication, advancements in treatment, and initiatives to improve quality of life. The global burden of Inflammatory Bowel Disease (IBD) is on the rise(1), with a projected exponential increase in the number of IBD patients in the Western world over the next decade(12). Newly industrialized countries are also expected to see a significant rise in IBD prevalence, potentially reaching levels similar to those in the Western world by 2025 due to population growth(12). By 2025, challenges related to accessibility, affordability, disparities in healthcare resources, and the cost of biologic agents may strain healthcare systems and worsen disparities in care worldwide(12).

Information regarding the impact of inflammatory bowel disease (IBD) in Africa stays largely unknown within sub-Saharan Africa due to limited awareness, deficiencies in diagnostic and clinical capabilities, and a significant rate of misdiagnosis attributed to the extensive prevalence of infectious diseases(16). According to the analysis of the global burden of disease, the age-standardized prevalence rates for the year 2017 were observed at 11.2 cases per 100,000 individuals in western sub-Saharan Africa, 9.9 cases per 100,000 individuals in eastern sub-Saharan Africa, and 10.2 cases per 100,000 individuals in central sub-Saharan Africa(17). Just like many other African nations and low- to middle-income countries, information on the prevalence, risk factors, policies, and clinical outcomes of inflammatory bowel disease (IBD) in Ethiopia is scarce.

2.2. Prevalence of Depression and Anxiety in in IBD patients

Global evidences have observed that individuals with Inflammatory Bowel Disease (IBD) are at a heightened risk of experiencing psychiatric disorders, which often coincide with a decrease in their quality of life(13). It has been observed that psychiatric disorders are 1.5–2 times more common in individuals with Inflammatory Bowel Disease (IBD) compared to the general population. (13). A retrospective cohort study conducted using the United States national inpatient sample between the year 2016 to 2018, incorporated a total of 963,619 patient encounters with diagnosis of IBD, to reveal that approximately 17% of them had depression and 21% had anxiety(5). A meta-analysis of five observational and population-based studies with a total of 767 patients found that the pooled mean rate of depressive symptoms across all IBD samples was approximately 21%. In a similar vein, the mean percentage of anxiety symptoms in all IBD cases was 19%(9, 18). In another meta-analysis of 171 studies with a total of 158,371 participants, it was found that approximately 35% of IBD patients experienced symptoms of anxiety, while 22 % reported symptoms of depression(6, 9). In addition to this a meta-analysis of 58 observational studies, reported a pooled prevalence of anxiety symptoms to be 32% and the combined prevalence of depressive symptoms to be 25%(8, 9). Various factors have been linked to the heightened psychiatric disorders in individuals with Inflammatory Bowel Disease (IBD)(19). A study involving 1663 IBD patients revealed that severe disease, flare-ups, noncompliance with treatment, being disabled or unemployed, and experiencing socioeconomic deprivation were all correlated with increased rates of depression and anxiety(19). In research conducted in Korea, 369 patients suffering from inflammatory bowel disease were examined. The study revealed that factors like marital status, the use of anti-tumor necrosis factor-α (TNF-α) agents, age, body mass index, disease activity, alcohol consumption, and employment status were linked to increased levels of depression and anxiety in individuals with IBD(20).

CHAPTER THREE: OBJECTIVES

3.1. General objective

- To assess the prevalence of anxiety and depression symptoms and associated factors among patients with Inflammatory Bowel Disease at Tikur Anbessa Specialized Hospital and Adera Medical Center, Addis Ababa, Ethiopia from June to September, 2023

3.2. Specific objectives

- To determine the magnitude of anxiety symptoms among patients with Inflammatory Bowel Disease at Tikur Anbessa Specialized Hospital and Adera Medical Center
- To identify associated factors with increased rates of anxiety symptoms
- To determine the magnitude of depression symptoms among patients with Inflammatory Bowel Disease at Tikur Anbessa Specialized Hospital and Adera Medical Center
- To identify associated factors with increased rates of depression symptoms

CHAPTER FOUR: METHODOLOGY

4.1. Study area and Period

The study was conducted at Tikur Anbessa Specialized Hospital (TASH), College of Health Science, Addis Ababa University and Adera Medical center, Addis Ababa, Ethiopia. Tikur Anbessa Specialized Hospital is one of the largest Tertiary care institutions in Ethiopia serving patients referred from across the country for more than five decades. It was established in 1972 G.C. with the aim of training medical doctors and other health professionals. Currently the hospital has more than 850 beds and serves about 500,000 patients as an outpatient and around 50,000 patients as an inpatient per year. Adera Medical Center is a private medical center located in Addis Ababa, Ethiopia. It was established with the aim of providing a wide range of medical specialty service for patients referred from Addis Ababa and various regions of the country. Among the services, is the gastroenterology and hepatology unit, given both as an outpatient and inpatient. The study was done by collecting data from IBD patients seen at Tikur Anbessa Specialized Hospital GI clinic and Adera Medical Center's outpatient clinic from June to September, 2023.

4.2 Study design

The study is a cross-sectional analytical study that assessed the hospital-based prevalence of anxiety and depression symptoms among patients with inflammatory bowel disease using data collected from patient

4.3. Population

4.3.1. Source of Population

The source population includes patients with gastrointestinal disorders who are on follow up at Tikur Anbessa Specialized Hospital and Adera Medical center

4.3.2 Study population

The study population was selected patients with inflammatory bowel disease who have follow up at Tikur Anbessa Specialized Hospital and Adera Medical center during the study period and fulfill the inclusion criteria

4.4 Inclusion and Exclusion criteria

4.4.1. Inclusion criteria

- IBD patients, including Crohn's disease and or Ulcerative colitis whose diagnosis is well established and have follow-up at Tikur Anbessa Specialized Hospital and Adera Medical center
- Those patients who are above the age of 18

4.4.2. Exclusion Criteria

- Those with co-morbid chronic medical illness like Diabetes, Heart failure, chronic kidney disease (CKD), Asthma and or Chronic Obstructive Pulmonary Disease (COPD), Malignancy and Retroviral infection (RVI)
- Those with prior known Psychiatric Illnesses

4.5. Sample size and Sampling technique

The sample size is calculated using 50% as the prevalence of anxiety and depression; since we don't have prior study done in the same area. 95 % level of certainty and a maximum discrepancy of 5% was considered.

$$n = \frac{Z^2 P(1-P)}{d^2}$$

Where n= sample size

Z= Standard proportion population at 95% confidence interval (1.96)

P= Estimated proportion of anxiety and depression (50%)

d= Margin of error (5%)

Sample size, n = 384. But Since our sample population is less than 10,000; Our required minimum sample will be calculated as 384/(1+(384/150))= 108. Then we will add 10% non-response rate to get final sample size=118

4.6. Data collection procedure and methods

Data was collected using a standardized questionnaires used to screen for Anxiety and Depression symptoms. They were adapted from previously published studies on the same topic and are also valid in our locality too. One of these tools is the Generalized Anxiety Disorder Scale (GAD-7); an anxiety screening tool; which has sensitivity and specificity of 89% and 82% respectively to pick generalized anxiety disorder. The Patient Health Questionnaire (PHQ-9) is another multipurpose, self-reported screening tool that has been validated and found reliable for use in screening, monitoring, and measuring the severity of depressive symptoms. It has shown sensitivity and specificity of 88% for major depression. Data was collected by trained data collectors under the supervision of the Investigator. Data collectors were selected from among the hospitals' GI unit nursing staff in both centers. Data collectors got one-day training by the principal investigator on how to obtain the required information from patients who are attending the GI clinic at both centers.

4.7. Study Variables

4.7.1. Dependent Variables

- Prevalence of Anxiety and depression

4.7.2. Independent variable

- Socio-demographic factors (Age, Sex, marital status, employment status, educational level and smoking status)
- Type of IBD (UC or CD), Disease activity, IBD treatment exposure (Steroid use, immunomodulator and or biologic use)
- Duration of IBD since diagnosis
- Previous IBD-related surgery

4.8. Operational Definitions

- Patients were labeled as having significant anxiety symptoms based on the GAD-7 screening tool for anxiety (Score≥10)
- Patients were labeled as having significant depressive symptoms based on the PHQ-9 screening tool for depression (Score≥10)
- Those patients on follow up who met standard criteria for CD and/or UC based on a combination of investigations (including clinical, biochemical, stool, endoscopic, imaging, and histopathology reports) were labeled as having IBD

4.9. Data quality control

Data collection tool was well validated which contain all information. It was pretested with 5% of the sample before data collection. Filled questionnaires were checked for completeness and consistency of information by the data collector and the Investigator once weekly during data collection. The template had internal consistency checks and any inconsistency or ambiguity were addressed in time.

4.10. Data analysis techniques

The categorical variables in the study were presented using frequency, percentage, and compared between groups using the chi-square test. The normal distribution of continuous variables was assessed using Shapiro-ilk test. The mean and standard deviation calculated for normality distributed data while median and interquartile range calculated for skewed data. Multicollinearity test performed for categorical, continuous and binary variables. Multicollinearity measured by variance inflation factor (VIF) and tolerance. When a VIF was below five and tolerance was above 0.1, variables were forwarded to multivariable binary logistic regression analysis. Variables with a VIF score of ≥ 5 to 10 and tolerance below 0.1 were excluded from the final model. A univariate binary logistic regression analysis was performed to examine the factors associated with Depression and Anxiety in IBD patients. Variables with p-value 0.25 or less in the bivariate analysis were entered into the multivariable binary logistic model. A multiple binary logistic regression model was performed to assess independent association between factors and Depression and Anxiety symptoms in IBD patients. The results of logistic regression reported as adjusted odds rations (OR) with 95% confidence intervals and p-value < 0.05 were considered statistically significant.

4.11. Ethical clearance

Ethical approval was obtained before the beginning of data collection from the Research and Publication Committee (RPC) of the Department of Internal medicine, Tikur Anbessa Specialized Hospital, College Health Sciences. All information obtained from the study subjects was kept confidential and used solely for the study purpose. Personal Identifier Information (PII), including names of patients were not included in the questionnaire. Codes were used instead and completed questionnaires were stored safely by the Investigator. Study participants who are identified as having significant depressive or anxiety symptoms based on the standardized screening tools will be linked to the psychiatry department for diagnosis and management.

CHAPTER FIVE: RESULT

5.1. Results

An analysis of 118 patients was conducted, revealing a median age of 33 years with an interquartile range of 12.5 years. Among the participants, 67.8% were female, and 53.4% were employed. The majority of patients (79.7%) were diagnosed with Crohn's disease, and 92.4% exhibited mild disease activity. Approximately 35.6% of the patients had undergone previous surgery. In terms of mental health, the prevalence of symptoms of depression and anxiety was found to be 7.6% and 5.1% respectively. These findings provide valuable insights into the demographics, disease characteristics, and mental health status of the patient population under study.

Table 1:Sociodemography characteristics and clinical profile of IBD patients at Tikur Anbessa Specialized Hospital (TASH) and Adera Medical Center, Ethiopia, 2024

Variable	Response	Frequency	Percentage
Age	Median ±IQR	33±12.5years	
Sex	Female	80	67.8
	Male	38	32.2
Education level	Highschool or below	60	50.8
	Undergraduate or postgraduate	58	49.2
Marital status	Divorced/widowed/single	68	57.6
	Married	50	42.4
Job	Employed	63	53.4
	Unemployed	55	46.6
Type of IBD	Crohn’s disease	94	79.7
	Ulcerative colitis	24	20.3
Smoking status	Smoker	9	7.6
	Non-smoker	109	92.4
Disease activity	Mild	87	73.7
	Moderate	28	23.7
	Severe	3	2.5
Previous IBD surgery	No	76	64.4
	Yes	42	35.6
Medication	Biologics	1	.8
	steroid and/ immunomodulator	117	99.2%
Depression	No	109	92.4
	Yes	9	7.6
GAD	No	112	94.9
	Yes	6	5.1

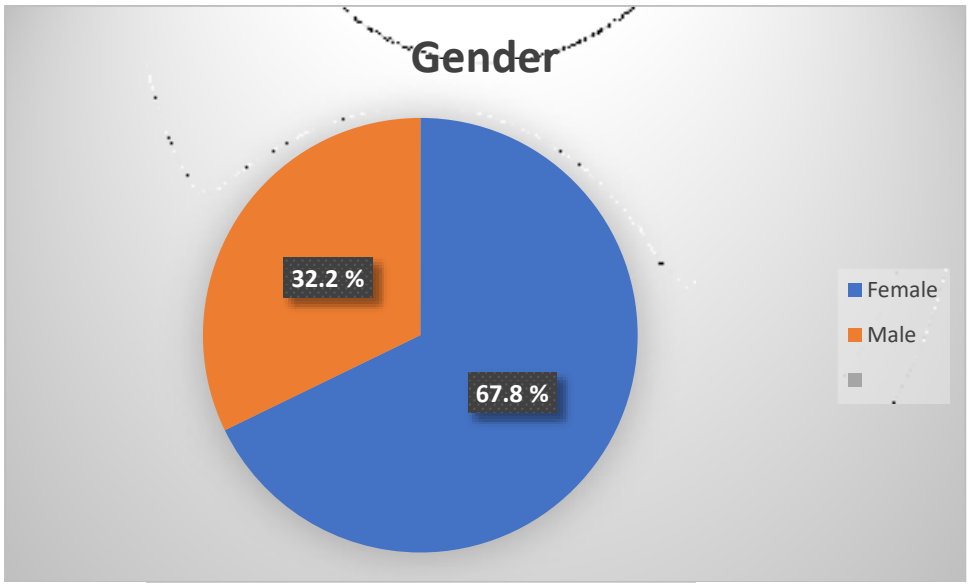

Figure 1: Gender distribution of IBD patients at TASH and Adera medical Center 2024

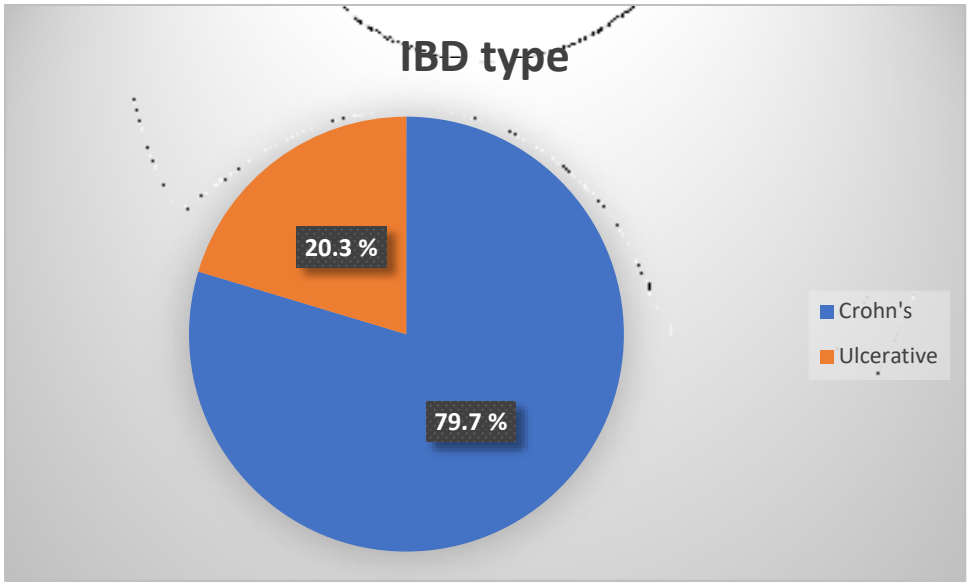

Figure 2: IBD types at TASH and Adera medical center 2024

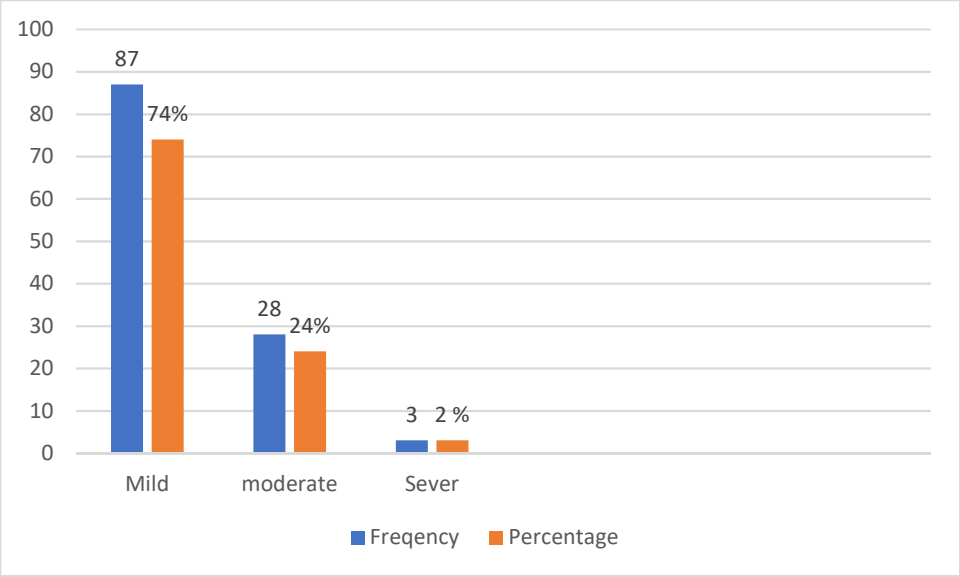

Figure 3: IBD disease activity at TASH and Adera medical Center 2024

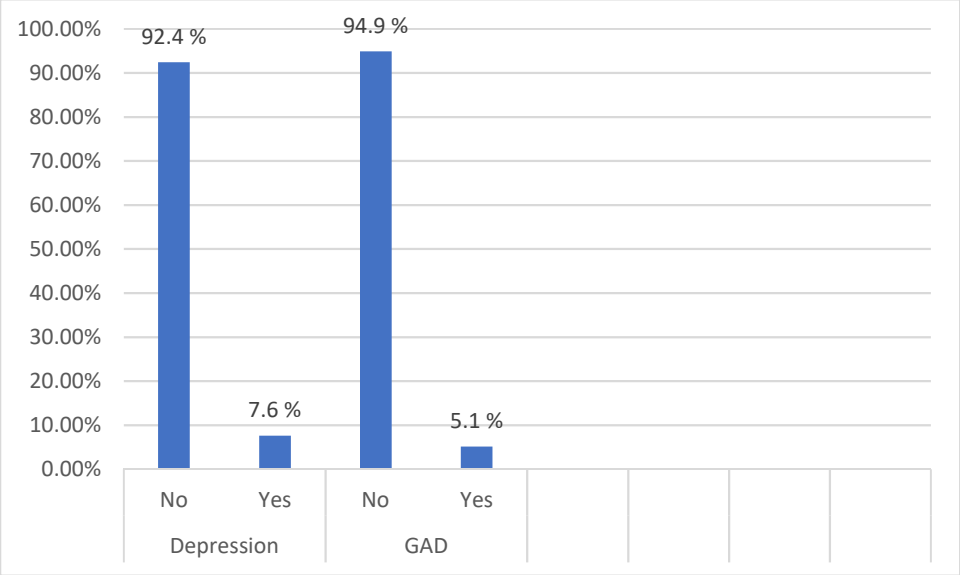

Figure 4: Prevalence of symptoms of depression and Anxiety among IBD patients at TASH and Adera medical Center 2024

The study revealed a 5.1% prevalence of generalized anxiety symptoms among individuals with IBD, underscoring the psychological complexities that coexist with the physical manifestations of the disease. Following the univariate analysis, variables identified as relevant, including smoking status and disease activity, were subjected to a multivariate analysis. This comprehensive approach

aimed to elucidate the intricate relationship between these factors and anxiety levels in IBD patients. Interestingly, the multivariate logistic regression revealed that smoking did not demonstrate a statistically significant association with anxiety in IBD patients (AOR=3.4, 95%CI: 0.42, 28.5, p=0.25), emphasizing the need for further investigation into the nuanced interplay between smoking habits and anxiety in IBD patients. The study unearthed compelling insights regarding disease activity levels and their correlation with anxiety in IBD patients. Moderate disease activity (AOR=9.9, 95%CI: 0.9, 106.2, p=0.058) showed positive association while severe disease activity (AOR=45.3, 95%CI: 2.0, 1018.0, p=0.016) emerged as statistically significant associated factor with heightened anxiety levels, underlining the clinical importance of disease management strategies aimed at alleviating these symptoms.

Table 2:Univarite and multivariate binary logistic regression to identify factors associated with significant symptoms of generalized anxiety disorder (GAD)among IBD patients in TASH and Adera Medical center, Ethiopia, 2024

Item	Variables	**GAD**		COR (95%CI)	P-value	AOR (95%CI)	P-value
		Yes	No				
Smoking status	Smoker	2	7	7.5 (1.17, 48.27)	0.034	3.4(0.42, 28.5)	0.25
	Non-smoker	4	105	1		1	
Gender	Female	4	76	0.95 (0.17, 5.41)	0.952		
	Male	2	36	1			
Marital status	Divorced/widowed/single	4	64	1.5 (0.26,8.53)	0.648		
	Married	2	48	1			
Educational level	Highschool or below	3	57	.965 (0.19, 4.99)	0.966		
	Undergraduate or postgraduate	3	55	1			
Job	Employed	2	61	0.42 (0,07, 2.38)	0.325		
	Unemployed	4	51	1			
Type of Inflammatory bowel disease	Crohn's disease	5	89	1.29 (0.44, 11.06)	0.819		
	Ulcerative colitis	1	23	1			
Year since the onset of disease	<4	5	74	2.57 (0.29, 22.76)	0.397		
	>/= 4	1	38	1			
Disease activity	Mild	1	86	1			
	Moderate	4	24	14.333 (1.53, 134.06)	.020	9.9(0.9,106.2	0.058
	Severe	1	2	43.0 (1.93,960.2)	.018	45.3(2.0 1018.0)	0.016*
Previous IBD related surgery	No	5	71	2.887 (0.326, 25.57)	0.341		
	Yes	1	41	1			

The study also revealed that 7.6% of the patients had significant symptoms of depression. In order to identify the factors associated with depression in these patients, both univariate and multi-variate binary logistic regression analyses were performed. This analysis aimed to determine the various variables that may contribute to the prevalence of significant depressive symptoms in this particular patient population. During the univariate analysis, several factors showed a positive association with increased depression in IBD patients. These factors included smoking status (COR=16.64 (3.39, 81.75), p=0.001), being male (COR=1.8(0.45,6.9), p=0.41), having ulcerative colitis (COR=2.10 (0.48,9.07) p=0.323), having a disease duration of less than 4 years (COR=3.44 (0.68,17.29), P=0.132), and having severe disease activity (COR=43.0(1.9,960.4), p=0.018). After adjusting for multiple variables in the multivariate analysis, it was found that moderate disease activity (AOR=16.1(1.7,156.7), p=0.015) and severe disease activity (AOR=49.8(2.1,1144.02), p=0.014) had a statistically significant association with significant depressive symptoms in this population. However, smokers (AOR=1.6(0.15,17.22), p=0.053) and those with a disease duration of less than 4 years (AOR=1.6(0.49, 17.2), p=0.07) also showed a positive association with increased depression, though these associations did not reach statistical significance.

Table 3:Univarite and multivariate binary logistic regression to identify factors associated with significant symptoms of Depression among IBD patients in TASH and Adera Medical center, Ethiopia, 2024

Item	Variables	**Depression**		COR (95%CI)	P-value	AOR (95%CI)	P-value
		Yes	No				
Smoking status	Smoker	4	5	16.64 (3.39, 81.75)	0.001	1.6(0.15,17.22)	0.053
	Non-smoker	5	104	1		1	
Gender	Female	5	75	1			
	Male	4	34	1.8(0.45, 6.9)	0.41		
Marital status	Divorced/widowed/single	5	63	1			
	Married	4	46	0.913 (0.22, 3.358)	0.896		
Educational level	Highschool or below	3	57	0.456 (0.11, 1.82)	0 .284		
	Undergraduate or postgraduate	6	52	1			
Job	Employed	4	59	0.578 (0.173, 2.66)	0.578		
	Unemployed	5	50	1			

Type of Inflammatory bowel disease	Crohn's disease	6	88	1			
	Ulcerative colitis	3	21	2.10 (0.48,9.07)	0.323		
Year since the onset of disease	<4	7	55	3.44 (0.68,17.29)	0.134	1.6(0.49 17.2)	0.07
	>/= 4	2	54	1			
Disease activity	Mild	1	86	1		1	
	Moderate	7	21	28.6(3.3, 245.8)	.002	16.1(1.7,156.7)	0.015*
	Severe	1	2	43.0(1.9,960.4)	.018	49.8(2.1,1144.02)	0.014*
Previous IBD related surgery	No	7	69	2.03 (0.41,10.24)	0.392		
	Yes	2	40	1			

CHAPTER SIX: DISCUSSION AND RECOMMENDATION

6.1. Discussion

This study offers valuable insights into the prevalence of mental health symptoms among individuals with Inflammatory Bowel Disease (IBD) within high-volume medical treatment sites. The research revealed symptoms of depression and anxiety to be 7.6% and 5.1% respectively Interestingly, these prevalence rates were notably lower when contrasted with findings from other observational studies and meta-analyses in the field. A retrospective cohort study utilizing the United States national inpatient sample from 2016 to 2018 revealed that out of 963,619 patient encounters diagnosed with IBD, around 17% exhibited signs of depression and 21% showed symptoms of anxiety (5). A meta-analysis of five observation and population-based studies including 767 patients found that the pooled mean rate of depressive symptoms across all IBD samples reporting percentages was approximately 21%. In a similar study, the mean percentage of anxiety symptoms in all IBD cases was 19%(9, 18). In another meta-analysis of 171 studies total of 158,371 participants, it was found that approximately 35% of IBD patients experienced symptoms of anxiety while 22% reported symptoms of depression(6, 9). Another extensive global evidence, in a meta-analysis of 58 observational studies, it was discovered that the pooled prevalence of anxiety symptoms was roughly 32%, and in a meta-analysis of 75 observational studies, the combined prevalence of depression symptoms was 25%(8, 9). Various factors have been linked to heightened psychiatric disorders in individuals with Inflammatory Bowel Disease (IBD)(19). In our study, we found that disease activity, smoking, unemployment, short duration

after diagnosis, ulcerative IBD, and being unmarried are positively associated with depression and anxiety in IBD patients. A study involving 1663 IBD patients revealed that severe disease, flare-ups, noncompliance with treatment, being disabled or unemployed, and experiencing socioeconomic deprivation were all correlated with increased rates of depression and anxiety(19). In research conducted in Korea, 369 patients suffering from inflammatory bowel disease were examined. The study revealed that factors like marital status, the use of anti-tumor necrosis factor agents, age, body mass index, disease activity, alcohol consumption, and employment status were linked to increased levels of depression and anxiety in individuals with IBD(20). Moreover, extensive longitudinal research has consistently indicated that individuals experiencing symptoms of anxiety and depression disorders tend to have more frequent flares of Inflammatory Bowel Disease (IBD) and experience worse disease activity(21). In summary, factors such as the emergence of a new disease, disease activity levels, medication side effects, stressful life events, hospitalization, and lower socioeconomic status can significantly impact the mental well-being of individuals with one or both types of IBD(22).

Conclusion: The likelihood of anxiety and depression in IBD patients is generally low, but can increase due to important factors such as disease activity, smoking, unemployment, a short duration after diagnosis, and having ulcerative IBD

6.2. Recommendation

Health care workers, policy makers, and researchers should prioritize screening for depression and anxiety in patients with Inflammatory Bowel Disease (IBD) as part of routine care. It is important to recognize that these mental health conditions can have a significant impact on the overall well-being and quality of life of IBD patients. Health care workers should be trained to identify symptoms of depression and anxiety in IBD patients, and provide appropriate referrals for mental health treatment. Additionally, they should work closely with mental health professionals to develop comprehensive treatment plans that address both the physical and emotional aspects of IBD. Policy makers should advocate for increased access to mental health services for IBD patients, as well as policies that promote integrated care for individuals with chronic illnesses. This can help ensure that patients receive the support they need to manage their physical and mental health effectively. Researchers should continue to study the relationship between depression,

anxiety, and IBD in order to better understand the underlying mechanisms and develop more effective interventions. By addressing the mental health needs of IBD patients, we can improve their overall health outcomes and quality of life.

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