

Assessment of Health-Related Quality of Life in Patients with Inflammatory Bowel Disease at Tikur Anbessa Specialized Hospital, Ethiopia

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Table of contents

Contents

List of figures 1

List of tables 1

Abstract 2

Acknowledgment 3

Abbreviations 4

1. Introduction 1

1.1 Background 1

1.2 Statement of the problem 3

1.3 Significance of the study 6

2. Literature Review 7

2.1 Burden of IBD 7

2.2 Over view of HRQOL in IBD 7

2.3 Level of QOL in IBD 8

2.4 Determinants of HRQoL in IBD 8

2.5 Solutions for the poor QOL in IBD 10

2.6 Measurement tools for HRQoL in IBD? 11

3. Objectives 13

2.1 General Objectives 13

3.2 Specific objectives 13

4. Methodology 13

4.1 Study setting 13

4.2 Study period 13

4.3 Study design 13
4.4 Source and study population 13
4.5 Sample size and sampling technique 14
4.6 Measuring Instruments 14
4.7 Inclusion and exclusion criteria for patients 15
4.8.1 Study Variables 15
4.8.1 Dependent variables 15
4.8.2 Independent variables 15
4.9 Definition of terms 16
4.10 Operational definitions 17
4.10 Data collection procedures 17
4.11 Data collection instruments 17
4.12 Data analysis and presentation 18
4.13 Data quality assurance and quality control ..... **Error! Bookmark not defined.**
4.14 Ethical consideration 18
Dissemination of the results 18
5. Results 19
6. Discussion and recommendation 29
6.1 Discussion 29
6.2 Conclusion 31
7 Recommendations 31
References 32
Annexes 42

List of figures

Figure 1: Factors related to HRQOL in IBD patients at TASH, 2024..... 12

List of tables

Table 1 Sociodemographic characteristics of IBD patients at Tikur Anbessa Specialized Hospital, TASH, Ethiopia, Feb 2024..... 19

Table 2: : Clinical characteristics of IBD patients at Tikur Anbessa Specialized Hospital, Ethiopia, February 2024 21

Table 3: SIBDQ domains of IBD patients at Tikur Anbessa Specialized Hospital, Ethiopia 2024 24

Table 4:Univariate and multivariate analysis of predictors of HRQOL in IBD patients at Tikur Anbessa specialized Hospital, Ethiopia 2024 25

Table 5:Predictors of HRQOL among CD patients at Tikur Anbessa specialized Hospital, Ethiopia February 2024 26

Table 6: Predictors of HRQOL among UC patients at Tikur Anbessa specialized Hospital, Ethiopia 2024..... 28

Abstract

Introduction: Inflammatory bowel diseases are chronic progressive/relapsing conditions that affect the younger population and have been associated with reduced health-related quality of life. HRQOL is an important outcome measure in IBD and helps to understand impact of the disease on the patient and the effect of treatment on the disease.

Aim: To assess health-related quality of life in IBD patients and associated socio-demographic and clinical factors.

Methods: A hospital-based cross-sectional study using the "Short Inflammatory Bowel Disease Questionnaire" (SIBDQ) was conducted in Tikur Anbessa Special Hospital from September 1, 2023 to December 30, 2023. Data were entered and analyzed using SPSS version 27. Descriptive statistics were used to show frequencies and percentages. A binary logistic regression model was used to assess predictors of impaired HRQOL in patients with IBD. Strength of association is measured by AOR and 95% CI. Variables with a P-value < 0.05 have a statistically significant association.

Results: Thirty-one percent of IBD patients in our study had impaired HRQOL (SIBDQ<50) with no statistically significant difference between IBD types, gender, marital status, residence, surgical treatment and duration of IBD. Unemployment (AOR= 4.36; CI 95%:1.34-14.18; p=0.014), not being in remission (AOR= 14.62; CI 95%: 2.31-92.53; p= 0.004), comorbidity (AOR= 9.18 ;CI 95%: 2.24-37.69, p=0.002), admission (AOR= 5.08; CI 95%: 1.45-17.76, p=0.011) and symptom duration > 6 months before diagnosis (AOR= 4.679; CI 95%: 1.31-16.74; P=0.018) were significantly associated with impaired HRQOL.

Conclusion: In our study, about one in three of IBD patients had impaired HRQOL. HRQOL was better with controlled disease activity; no hospitalization, no EIMs, and no comorbidity; early diagnosis, employment, and higher educational level.

Key words: IBD, QoL, HRQOL, health related quality of life, quality of life, inflammatory bowel disease, CD, Crohn's disease, Ulcerative colitis

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Abbreviations

6-MP: 6-Mercapto purine

AAU: Addis Ababa University

ASA: Acetylsalicylic Acid

ASUC: acute severe UC

AZA: Azathioprine

CAI: Clinical activity index

CD: Crohn's disease

CDAI Crohn's Disease Activity Index

CDAI Crohn's Disease Activity Index

CHS: College of Health Sciences

DAI: Disease activity index

EIM: Extra intestinal manifestations

GI: Gastrointestinal

HR-QoL Health-related quality of life

IBD: Inflammatory bowel disease

IBDQ: Inflammatory Bowel Disease Questionnaire

IBS: Irritable bowel syndrome

MMAS-8: Modified Morisky Adherence Scale

MTX: Methotrexate

OPD: Outpatient Department

PROs Patient-reported outcomes

SCCAI: Simple Clinical Colitis Activity Index

SF-36 Short For -36 Health Survey Questionnaire

SIBDQ: Short Inflammatory Bowel Disease Questionnaire

SPSS: Statistical Package for Social Science

TASH: Tikur Anbessa Specialized Hospital

UC: Ulcerative colitis

1. Introduction

1.1 Background

Inflammatory bowel diseases (IBDs) are chronic disabling conditions, usually affects young people and is marked by an unpredictable course with flare-ups and intervals of remission and requires lifetime medical follow-up and treatment (1, 2).

The chronic inflammatory bowel diseases include ulcerative colitis (UC) and Crohn's disease (CD), although there is a small group of patients with an intermediate form (3).

Ulcerative colitis is an inflammatory process that is always limited to the colon and manifests clinically as weight loss, mucus in the stools, bloody diarrhea, and abdominal pain (4).

CD can affect any part of the digestive tract from the mouth to the anus, although the terminal ileum is the commonest site and clinically manifests with abdominal pain, diarrhea and weight loss. On rare occasions, it can present with an abdominal mass, intestinal obstruction, or fistula(5).

There are large regional variations in the incidence of IBD worldwide. North America and North-West Europe have a high incidence. Even though its uncommon in Asia and Africa the incidence in Africa is rising, likely due to multiple factors, including shifting trends in diet and exposure to environmental pathogens (1, 6).

For many years, clinical remission and response, followed by normalization of biomarkers and mucosal healing, were the main outcomes of IBD treatment. Given that multiple studies have demonstrated that IBD negatively affects HRQoL on both a physical and psychological level, it has been suggested in recent decades that HRQoL is a key outcome of IBD treatment. Since HRQoL has been measured in many research assessing various IBD treatments, including real-world studies and clinical trials, an increase in QOL will also benefit IBD patients' prognosis. HRQoL has been shown to improve with the majority of therapies utilized in clinical practice (2).

Quality of life is defined by the WHO as "individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns". It is a comprehensive notion that intricately integrates a person's level of independence, social ties, psychological condition, physical health, and personal views, as well as how those aspects relate to prominent environmental factors (7)

Improving quality of life (QOL) should be a primary goal of therapy for inflammatory bowel diseases (IBDs), as these are chronic conditions that affect patients for the rest of their lives. Important aspects of quality of life are not fully addressed by scores employed in clinical daily practice, which primarily focus on somatic variables. Most importantly, extra intestinal manifestations show a previously underestimated impact on QUOL (8).

IBD negatively affects life quality because it affects the physical, emotional, social and psychosocial status of these patients. Patients with IBD generally have higher levels of daily stress and lower QOL when compared with healthy persons (9, 10). The chronic and unrelenting nature of these diseases, the often early age of onset, and the impact on social and sexual aspects of life significantly change patient's perception, body image and quality of life (11)

Quality of life in IBD can be affected by patient related, disease related and treatment related factors(12). IBD-related problems at work negatively influence quality of working life. Fatigue, decreased HRQL and work loss independently predicted decreased work life quality in IBD (13).

Those with IBD who disclose having higher levels of stress, less perceived social support, more frequent illnesses, or who are female may be at greater risk for decreased HRQOL(14).

Health-related quality of life (HRQOL) can measured using questionaries in research and patient care to extend the clinical assessment of patients with IBD(15)

1.2 Statement of the problem

According to the Global Burden of Disease, Injury and Risk Factors Study (GBD) 2017, the prevalence of IBD rose dramatically between 1990 and 2017 in many regions; 79.5 (75.9-83.5) per 100,000 population - 84.3 (79.2-89.9) per 100,000 population; which could place a significant social and economic burden in the upcoming years on governments and healthcare systems. Nationally, the United States had the highest age-adjusted prevalence (464.5 [438.6–490.9] per 100,000), followed by the United Kingdom (449.6 [420.6–481.6] per 100,000). The total number of YLDs attributed to IBD nearly doubled during the study period from 0.56 million (0.39–0.77) in 1990 to 1.02 million (0.71–1.38) in 2017. Age-standardized DALYs were reduced by 26.5 (21.0–313.0) per 100,000 people, in 1990 to 23.2 (19.1-27.8) per 100,000 inhabitants in 2017(16).

In a large cohort of 5,576 European patients with response rate, three quarters were either very (40.0%) or somewhat (36.0%) satisfied with the results obtained from their current treatment medication and 75.6% reported that symptoms affect their ability to engage in leisure activities, although more than two thirds (68.9%, n = 3841) said their symptoms interfered with their capacity to work. But 47.8% of respondents said their doctor never inquiries about how their ailments affect their quality of life. Better QoL was achieved with biologics therapy than immunomodulators and steroids (75%, 72.7% and 72.8% respectively)(17).

In Ethiopia, the age-standardized IBD prevalence rose from 8.8/100,000 in 1990 to 9.7/100,000 in 2017. IBD-caused mortality was 0.6, with -2.5 percent change from 1990 to 2017(16).

A previous survey on 102 IBD patients (29 UC, 73 CD and a ratio of 2.5:1) at TASH showed the mean age at diagnosis was 26.4 years for CD and 33 years for UC. About 16.6% of cases reported EIM symptoms. The most prevalent disease behavior in CD patients was the inflammatory type (49.3%), whereas the most common disease phenotype was the ileo-colon type (38%); 18.6% of these individuals underwent bowel resection. None of them were on biologic therapy(18).

IBD has a high social burden and there is a strong correlation between patient-reported disease symptoms and disability, impairment of daily functioning, disability pensions and out-of-pocket costs(19).

Patients with IBD have a lower health-related quality of life than the healthy controls. In multi center Spanish study, UC and CD impair patients' HRQOL, and the degree of impairment depends

on disease activity, female sex, time since diagnosis but is independent of the type of disease and place of residence (20, 21).

In a study with Greek IBD patients; patients with disease activity were more impaired than patients in remission. In this survey; bowel and systemic domains had a predominant value in patients quality of life (22).

In another study in Brazil, patients with Crohn's disease are more commonly submitted to surgeries and hospitalizations. The quality of life is compromised in patients with both types of inflammatory bowel disease.; moderate to severe activity, female gender, being unemployed, a lower educational level and lower income were associated with lower QoL ($P < 0.05$). The mean decrease in work productivity was 20% among CD and 5% among UC patients, and the decrease in activity was 30%, the latter being higher in individuals with moderate to severe disease activity compared to patients with mild or no disease. (75.0). % vs. 10.0%, $P < 0.001$). Among patients with CD/UC, 25.4% and 2.8% underwent one or more surgeries, 38.3% and 19.6% were hospitalized, and 70.7% and 77.6% had at least one change in their IBD treatment in the previous three years (23, 24).

Anxiety, depression, and disease activity are risk factors for relapse and have a negative impact on disease history and HRQoL. There is continuing negative impact on QOL by the disease, even when it is inactive. The combination of medications, pain, and anemia can reduce performance in school and social settings. Reactions to pain and uncomfortable examinations lead to a state of fear. Women with IBD may experience dyspareunia and lack of libido as Crohn's disease worsens and medications reduce fertility (25-27).

In a study to assess restoration of quality of life with IBD after receiving anti-TNFα therapy; normalization of HRQOL (IBDQ-36) was achieved in all UC patients and in 67% among patients with CD with Adalimumab and infliximab therapy for one year. Early recovery of HRQoL with anti-TNF medications is linked to long-term remission. Restoration of health was significantly more frequent in UC than in CD ($p<0.05$) (28, 29).

In a population-based cohort study that sought to determine clinical and demographic factors influencing HRQOL 5-, 10-, and 20-years following diagnosis in individuals suffering from Crohn's disease (CD) or ulcerative colitis (UC) since 1990 (IBSEN Study); after five years, patients' HRQOL as determined by the IBDQ is highly impacted by IBD symptoms, rheumatic

symptoms, and female gender. Current symptoms, corticosteroid use, unemployment, female gender and smoking had a negative effect on HRQL at 10 years. After 20 years, factors linked to reduced HRQL were occupational disability, elevated disease activity, and present symptoms (30-32).

Inflammatory bowel diseases are increasing in developing countries, including Africa. Most of these patients present in late stages and they get sub optimal treatment, due to low access to biologics. Quality of life assessment in IBD can aid in reducing the disease burden and help address the factors affecting it.

The fact that the relatively younger patients with IBD, late presentation and diagnosis and little or no access to biologics therapy results in higher disease activity and more common complications which will have effect on QOL. Assessment of HRQoL in IBD patients improves understanding of disease impact and treatment effect on disease and should be acknowledged by patients and their providers as a crucial outcome measure.

1.3 Significance of the study

Since most HRQOL studies were conducted in Western countries, their results may not be representative of the Ethiopian IBD population due to cultural differences and different coping strategies. HRQOL among IBD patients in Ethiopia has not been investigated so far.

The aim of the study is to assess and compare HRQOL in Ethiopian patients with IBD and to identify sociodemographic and clinical variables that influence their HRQOL. The study will be used for officials and clinicians in designing optimal treatment IBD patients. IBD HRQOL used as a treatment endpoint improves treatment efficacy and patient prognosis, which is low and worse in most Ethiopian IBD patients.

2 Literature Review

2.1 Burden of IBD

A systematic review published in 2012, including studies from Europe (1930–2008), Asia as well as the Middle East (1950–2008), and North America (1920–2004), reported that 75% of CD studies and 60% of UC studies showed significant rise in incidence ($P < 0.05$) (33).

Crohn's disease incidence in South America is increasing and reached an average of 1–3 per 100,000 to 3–4/100,000 in urban areas of Brazil. In 2035, a 2.5-fold rise for Iran, a 2.3-fold increment for North Africa and the Middle East, 4-fold rise for India, a 1.5-fold increase for East Asia region, and a 1.6-fold elevation in prevalence for high-income Asia-Pacific and Southeast Asia regions is expected based on illness-death model, 2017-2035. Although there are few epidemiologic data from developing countries, IBD prevalence and incidence is increasing over time and in different regions around the world. In a population-based study of IBD published in Australia in 2010, annual incidence rates ranged from 23.5 to 36.7 cases for every 100,000 persons per year (34-36).

There is little published information describing the actual IBD burden in sub-Saharan Africa and its natural history this disease is unknown. IBD incidence is increasing in Africa, and if it follows similar epidemiological trends in the West and Asia, it may become a public health problem soon after (1, 37).

In Ethiopia, according to the previous GBD 2017 report; there is 10.1 % change in age standardized IBD prevalence rate from 1990-2017; which in 1990 was 8.8 per 100,000 inhabitants, then 9.7 per 100,000 population 2017 (16).

2.2 Over view of IBD HRQOL

Meta-analysis and systematic review to assess indicators of Crohn's disease patients' health-related quality of life showed HRQOL of adult CD patients is consistently determined by work disability, increased disease activity, relapse rate, biological therapy, and hospitalization rate. Illness activity affected only 37% of HRQOL, therefore other additional determinants may possibly be modifiable and improve HRQO(38).

2.3 Level of QOL in IBD

HRQOL is lower in IBD than general reference population as shown from population cohort and systematic review studies (39, 40).

A study from Germany demonstrated that large patient numbers in both UC and CD revealed a QUOL impairment (87.34% in UC and 91.08% in CD) using SIBDQ. Active extraintestinal features, smoking, a strong fear of the condition getting worse, and a strong desire for psychotherapy were linked to decreased QOL (8).

A cross-sectional survey done on 52 Crohn's disease patients using IBDQ showed that 32.7% had regular QoL, 30.8% had good QoL, 26.9% had excellent QoL, and 9.6% had a poor QoL (41).

In another survey from Portugal; IBD patients considered their life quality moderate (45.80%) and higher (49.50 in the dimension of systemic symptoms %) and weaker in the social function dimension (36.50%) (42).

2.4 Determinants of IBD HRQOL

1. ***Disease-related factors***

As the severity of IBD increases, the HRQOL burden of IBD patients increases, and reducing the severity of IBD even to a mild level can potentially improve HRQOL in IBD patients (43, 44).

In a study to evaluate clinical and pharmacological factors associated with impaired quality of life and disability in a large cohort of IBD patients during IBD treatment in Italy, Padua; showed disability and quality of life are both associated with active disease, anemia, presence of extra intestinal features, and phenotype of Crohn’s disease while current therapy and quality of life throughout treatment were unrelated (IBD-DI and IBDQ ($r = 0\ 84$, $p < 0\ 001$)) (45).

Patients with active disease had a lower health-related life quality as opposed to patients with inactive disease (5.8 (4.5–7.5) vs. 2 (0.8–3.3)) (46).

In CD and UC, the quality of life was not significantly different and patients with longer disease duration experienced a better quality of life than patients with short disease duration. CD patients and short disease duration have poor health-related quality of life (47).

In a study to elucidate which health status variables are related with HRQOL in IBD patients; lower recurrence/year index, longer disease duration, symptom activity, non-necessity of

hospitalization all predict a better HRQOL ($p < 0.05$). In another study; recurrence and long duration were correlated with a low standard of living (12, 48, 49).

2. ***Patient-related factors***

Higher levels of perceived stress are a powerful indicator of worse HRQOL and worse adherence to physician advice in IBD patients. In addition, women with CD and more often patients with IBD relapses may have a decreased chance of HRQOL (50).

Health-related quality of life was impaired in both sexes for all symptoms: frequency of stools during the day (0.37–0.86 and 0.46–0.84), urgency of defecation (0.54–0.79 and 0.49–0.65) and blood in feces (0.50–0.75 and 0.36–0.54) for men and women respectively. Women were more often affected by nocturnal negative bowel density and arthritis (46).

In a study that evaluated the correlation between patients' quality of life (QoL) and psychological aspects in Greek IBD patients; levels of depression, anxiety and stress were associated with decreased quality of life with $p<0.001$, $p=0.013$ and $p=0.002$ respectively (51).

In another study to assess sociodemographic and health-related factors linked to HRQOL in IBD patients using the IBDQ-36 questionnaire; presence of symptoms and socio-demographic elements such as gender (female) and education (the higher the better) are the main factors contributing to the deterioration of HRQOL among patients with IBD ($p < 0.05$) (48).

In another similar study at Saudi Arabia; low education and young age at disease onset were associated with low quality of life (49).

Among US with IBD patients, higher levels of perceived stress strongly predict decreases in HRQOL and in compliance with clinician advice. In addition, ladies with CD and more often patients with IBD relapses may possess a decreased chance of HRQOL (50).

During a year- long prospective observational study of HRQOL among individuals with moderate to severe Crohn's disease (CD) in Iran showed unemployment and presence of “other chronic conditions” had the greatest detrimental effect on their HRQOL (52).

3. **Impact of individual IBD symptoms on HRQOL**

In a study to investigate correlation of symptoms of UC with health-related quality of life in moderate-to-severe active ulcerative colitis getting biologic therapy; HRQOL was most clearly related to frequency of defecation during the day, urgency of defecation and bloody stool (46).

From a cohort of Canadian IBD patients; anxiety (P<0.001), depression (p=0.004), fatigue (p=0.018) and IBS symptoms (p<0.001) are all independently associated with lower QoL (12).

4. **Impact of therapy on HRQoL**

Significant improvements were observed in all assessed categories of HRQoL and work-related outcomes in patients with UC undergoing daily multimatrix mesalamine therapy. After receiving daily treatment for a year, patients who experienced partial or complete clinical and endoscopic remission continued to show improvements in the majority of these domains. HRQOL changes and work-related outcomes and disease activity were inversely related (54).

A prospective cohort study, 1994-1997, to measure the effect of surgical resection on quality of life in patients with IBD; showed HRQL scores are low in many patients with IBD referred for operation and HRQL scores improve postoperatively to levels comparable to the general population(55).

In prospective cohort of IBD patients from Eastern and Western Europe to assess pattern of HRQOL; medical and surgical treatment improved HRQOL during the first year of disease. Most patients with IBD reported a positive impression of disease-specific but not general HRQOL. Patients with CD experienced an improvement in HRQOL with biological treatment, whereas patients with UC requiring surgical or biological therapy had worse perceived HRQOL than others (56).

In long-term QoL assessment of ASUC (acute severe UC) patients enrolled in the CONSTRUCT trial following treatment of UC with infliximab or cyclosporine showed; both infliximab and cyclosporine improve QoL following initial treatment for ASUC. The QoL score remains higher than at admission seven years after treatment (57).

2.5 Solutions for the poor QOL in IBD

Psychological interventions for patients who suffer from IBD should address body appreciation and meaning in life (58).

In a study designed to determine the variables linked to a low quality of life in Canadian patients during clinical remission from IBD; anxiety, depression, fatigue, and IBS symptoms are independently associated with lower quality of life. Clinicians are encouraged to examine these important factors because they may adversely affect the life quality of patients with IBD even during remission (12).

All measured HRQOL domains and work-related outcomes improved in UC patients receiving daily multi-matrix mesalamine therapy. Individuals who attained either full or partial endoscopic and clinical remission continued to benefit from these improvements in most of these areas for twelve months with ongoing treatment (54).

A cross-sectional study conducted among 1176 IBD patients in Italy for examining the effect of patient adherence on HRQOL found that patients participating in IBD treatment were more likely to report higher levels of HRQOL. Screening the patient's level of health compliance with appropriate interventions can improve treatment and eventually enhance the outcomes of HRQOL for IBD patients to investigate the effect of patient adherence on HRQOL. This showed that patients who adhere to IBD treatment are more prone to report higher levels. From HRQOL. Examining patients' health levels with appropriate interventions can improve treatment and ultimately improve HRQOL outcomes in IBD patients (59).

2.6 Measurement tools for HRQOL in individuals with IBD

HRQOL instruments for evaluating IBD patients mostly fall into two categories: general and disease specific. Diagnostic tools that assess symptoms and evaluate the efficacy of various therapies are general tools that allow comparisons between different populations and diseases (60).

With strong validity and reliability, the IBDQ-32 was the most commonly utilized tool among adults, followed by the SIBDQ and the IMPACT-III (for pediatric patients). This systematic study compared and evaluated the assessment characteristics of IBD-specific health-related quality-of-life instruments (61).

The IBDQ-32 was created at McMaster University in Hamilton, Canada, in the late 1980s. Item was selected based on interviews with UC or CD patients and clinical specialists, then cognitive review between IBD patients and healthcare providers, leading to 32 targets. All items use a 7-point Likert-type scale to record symptom experience in the past 2 weeks, where 1 represents the most frequency/severity of symptoms and 7 represents the lowest frequency/severity of symptoms. The final IBDQ contains ten questions regarding bowel symptoms, five pertaining to systemic symptoms, five questions related to social functioning and twelve questions related to emotional functioning (62).

The Short Inflammatory Bowel Disease Questionnaire (SIBDQ) is a condensed form of the IBDQ-32, also includes bowel, systemic symptoms, social and emotional components. The SIBDQ was

proved to be valid, reliable, and capable of detecting clinically significant changes in HRQOL that can occur in an office setting after being assessed in 150 different patients with Crohn's disease and 45 those suffering from ulcerative colitis. Ten items were chosen (stepwise regression) from 149 Crohn's disease patients' clinical trial data that best explained variance in IBDQ or dimensions (intestinal, systemic, social, emotional). All scores were presented on a 7-point rating system (1 = low HRQOL, 7 = optimal HRQOL). For ulcerative colitis and Crohn's disease, respectively, SIBDQ explained 90% and 92% of the variation in IBDQ. With regard to stable Crohn's disease patients, good reliability was shown by a test-retest reliability coefficient of 0.65 and a Crohnbach alpha of 0.78. Crohn's disease patients who, when followed up, relapsed had a mean SIBDQ reduction of -0.93 + 0.55 ($p = 0.001$) (63).

There are also other valid and reliable HRQOL assessment tools in IBD; such as IBDQ-36, and its short form IBDQ-9 (64, 65).

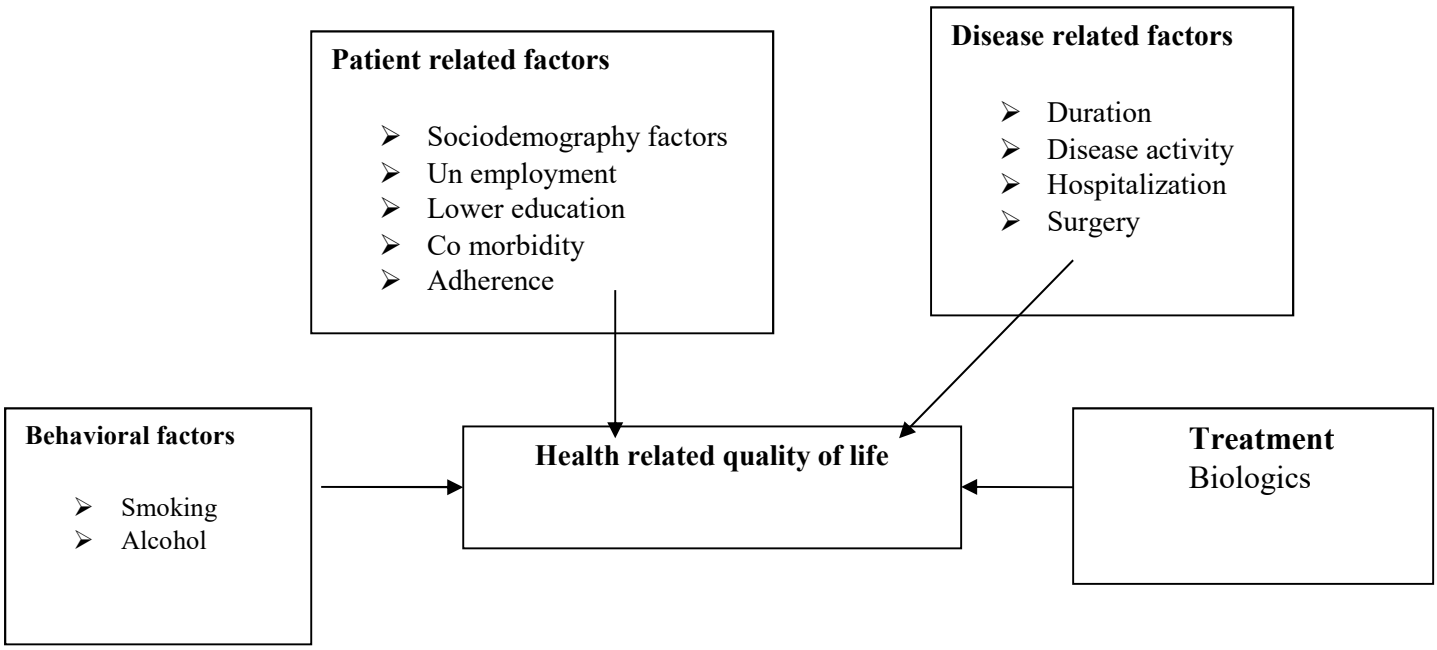


Figure 1: Factors related to HRQOL in IBD patients at TASH, 2023

3 Objectives

2.1 General Objectives

To assess health related quality of life of IBD patients and associated factors at Tikur Anbessa Specialized Hospital, Ethiopia

3.2 Specific objectives

To assess health related quality of life in IBD patients at Tikur Anbessa Specialized Hospital, Ethiopia

To determine socio demographic and clinical predictors of HRQOL of IBD patients at Tikur Anbessa Specialized Hospital, Ethiopia

4 Methodology

4.1 Study setting

The study was conducted in adult gastro-enterology (GI) referral clinic at Tikur Anbessa Specialized Hospital/TASH/. TASH is the main tertiary referral center in Ethiopia, located in the capital, Addis Ababa. TASH provides specialized and comprehensive medical care to the immediate community and beyond who are referred for specialty consultations and/or interventions. It is also a teaching hospital for the Addis Ababa University, College of Medicine and Health sciences and is involved in undergraduate, postgraduate and fellowship trainings in different fields of clinical medicine.

4.2 Study period

The research was carried out between September and December 2023

4.3 Study design

Institution based cross sectional survey study was done on IBD patients who has follow up at GI clinic, TASH

4.4 Source and study population

Source population were all patients seen at the GI outpatient clinic of TASH during the specified study period.

The study population of this study was sample IBD patients at TASH on follow up

4.5 Sample size and sampling technique

Single proportion sample size formula and non-probabilistic convenience sampling technique (Chochran, 1963) $\boldsymbol{n = z2 \times p(1-p) \div d2}$

Where n = Sample size,

Z = Z statistic for a level of confidence

P = Expected prevalence or proportion;

d = Precision.

Using 95% confidence level (Z score=1.96, 5% precision (d) and 50% proportion (p)

n= $(1.96)^2 0.5(1-0.5)/(0.05)^2$

n=385; since the total IBD population is less than 10,000 (~150-200); final (Yamane, 1967)

$$n = \frac{no}{1 + \frac{no - 1}{N}}$$

n= 121

Considering 10% non-response rate, final sample size was 133 (finally 131 patients were interviewed and were analyzed; 98.5% response rate)

4.6 Measuring Instruments

Population Characteristics: Socio-demographic information mainly age, sex, employment, residence, marital status, smoking status (smoker and nonsmoker/past-smoker)

Clinical Assessment (IBD-Related Variables): Clinical data collected from patients included duration and location phenotypes of intestinal disease (according to Montreal classification), disease activity assessment (using the Mayo Score and CDAI), duration of symptoms before diagnosis, EIMs, history of previous IBD-related surgery, hospitalization, and medical treatments. Current medical treatments and drug adverse effects will also be collected.

IBD Questionnaire (IBDQ) Score. The validated version of the SIBDQ was used to measure quality of life.

4.7 Inclusion and exclusion criteria for patients

Inclusion criteria

Age 18 years and above during the study period

Any patient with diagnosis of IBD (both new and follow up patients)

Patients who gave informed consent

Exclusion criteria

Individuals whose chart is lost/incomplete

Patients with neuropsychiatric conditions

Patients with stomas

4.8 Study Variables

4.8.1 Dependent variables

Health related quality of life (HRQOL)

4.8.2 Independent variables

The socio-demographic characteristics (age, gender, marital status, education level, employment, residence), behavioral factors (smoking)

The clinical variables: their diagnosis (UC or CD), family history of IBD, disease duration, disease location and behavior, duration of symptoms before diagnosis, presence of EIMs, number of hospitalizations and surgical procedures over the past 1 year, comorbidity and Charlson Comorbidity Index (CCI), treatment modality, adverse effects of treatments and medication adherence.

4.9 Definition of terms

Charlson Comorbidity Index: assesses co morbidity level by taking into account the number and severity of co morbid conditions. As per CCI, following co morbid classes will be given; Low= 0, medium=1-2 points; high=3-4 points; very high>= 5 points

Crohn's Disease Activity Index (CDAI): primarily a research tool to quantify symptoms of Crohn's and to measure improvement with treatment. Use of this instrument in a clinical environment is challenging due to its weighted combination of eight subjective and objective criteria and the requirement for a seven-day logbook. The CDAI thresholds are;0-149= asymptomatic remission; 150-220- Mildly to moderately -active CD; 221-450- Moderately to severely active CD; 451-1100= Severely active to fulminant disease

EIM: Extra intestinal manifestations of IBD include musculoskeletal, urinary tract, hepatic, ocular, and mucocutaneous involvements.

Inflammatory bowel disease: For this study, IBD diagnosis will be considered when the diagnosis of CD and UC is made by based on the following criteria:

CD: Diagnosed when endoscopy reveals suggestive endoscopic features (like skip lesions, mucosal ulcerations, cobblestone appearance, aphthous ulcers,) with supportive histologic findings (including deep inflammation or chronic terminal ileal inflammation) in a patient with typical clinical symptoms.

UC: Diagnosed when endoscopy reveals suggestive endoscopic features (like a diffuse mucosal disease of colon with different proximal extensions from the rectum, superficial inflammation, and rectal involvement without any evidence of small bowel involvement other than backwash ileitis) with supportive histologic findings (vascular congestion, crypt abscesses, cryptitis, and crypt branching) in a patient with typical clinical symptoms.

Indeterminate colitis: Include any case that satisfies the requirements for neither UC nor CD but has endoscopic, radiographic, or histologic evidence of chronic inflammatory bowel disease limited to the colon.

Mayo score: Composite of clinical, endoscopic, quality of life and global assessment index, scores 0-12; 0-inactive disease; 1-2- Remission, 3-5-Mild disease; 6-10- Moderate disease; >=10-Severe disease activity

If recent colonoscopy is not available; the Simple Clinical Colitis Activity Index (SCCAI) was used; which uses day and night bowel frequency, urgency of defecation, blood in the stool, general well-being and extra colonic features. The SCCAI (0-19) thresholds are; <=2- Remission; 3-5- mild disease, 6-11- moderate disease and >=12-severe disease activity

Montreal Classification: Addresses aspects of clinical definition and classification for Crohn's disease and ulcerative colitis for use in clinical practice as well as for future genetic and serologic studies

4.10 Operational definitions

Good quality of life: SIBDQ score >=50; poor QOL- SIBDQ< 50

Modified Morisky Adherence Scale (MMAS-8)**:** An effective validated and reliable tool for assessing adherence in chronic illness, including IBD, with total score 0 to 8; higher score indicating better adherence. Those with MMAS8 score below 6 are classified as non-adherent/low adherent; score 6 and above are classified as medium and high adherers.

4.10 Data collection procedures

After informed consent taken 131 sequential IBD patients were interviewed in convenience manner and their clinical and socio demographic variables were collected from electronic records. Two experienced data collectors at TASH interviewed eligible patients and reviewed their charts/ electronic recordings and filled the questionnaire. The data collectors were supervised by one trained supervisor at data collection site.

4.11 Data collection instruments

Data was collected using semi structured questionnaire composed of two parts. The first part was composed of a set of questions on three dimensions: Sociodemographic, Behavioral, and Clinical. The socio demographic and behavioral data was filled with interview and patient charts. Charlson comorbidity index and MMAS8 were determined for comorbidity and medication adherence.

The second part was composed of the Short Inflammatory Bowel Disease Questionnaire (SIBDQ), which was translated in to Local Language. SIBDQ contains bowel, systemic symptom, social and emotional sections.

4.12 Data analysis and presentation

Collected data was verified, cleaned and checked for quality before the analysis. The IBM SPSS Statistics software package version 27 was used for entry of statistical data and analysis. Descriptive statistics was used to describe frequencies and numbers (percentages %). The results were summarized by using tables, and figures. Continuous variables will be represented as means, medians, standard deviations and minimum and maximum values, and categorical variables as frequencies. HRQOL and sociodemographic, clinical and behavioral factors association were assessed using model of univariate binary logistic regression. Factors which were statistically significant were then incorporated into a multivariate analysis from the univariate ones. binary logistic regression model with the SIBDQ class (as impaired HRQOL or good HRQOL, based on SIBDQ score) as the dependent variable. The strength of association is measured using AOR and the 95 %.CI. Variables that have association at P- value < 0.05 are declared that have statistically significant association.

4.13 Quality assurance and control of data

Data quality was assured through careful, design, translation and retranslation and pretest of the questionnaire, the data was collected by trained health professional who clearly understands data collection tools. The questioners were developed by the researcher by reviewing different standard tools related with this study. Data completeness was checked and daily communication with the data collectors was also held. After complete data collection the researcher and data collectors re checked the data-by-data cleaning and processing by doing simple frequency.

4.14 Ethical consideration

We received ethical approval from AAU, CHS and written consent was taken from participants. The data collectors clearly stated for the participants that they have the right of unwilling to participate in the study and they have also the right to quit their participation at any stage without any restriction. Moreover, the participants were aware of the study's objectives, methods, benefits, and drawbacks.

4.15 Dissemination of the results

This study finally is to be submitted and presented for department of internal medicine, GI unit. The paper will be submitted to reputable journal for publication

5 Results

Sociodemographic characteristics

One hundred thirty-one IBD (n=131) patients were interviewed for HRQOL. From this study female and male were 67.2% (n=88) and 32.8% (n=43) respectively with the median age of 33 years (±12). About 3.8% of IBD patients has had family history, 92.6% were from urban areas and 96.9% had never smoked cigarette (table 1).

Table 1 Sociodemographic characteristics of IBD patients at Tikur Anbessa Specialized Hospital, TASH, Ethiopia, Feb 2024

Variables		Frequency	Percent
Marital status	Married	59	45.0
	Divorced	4	3.1
	Single	64	48.9
	Widowed	4	3.1
Gender	Male	43	32.8
	Female	88	67.2
Educational status	Can't read and write	3	2.3
	Can write and read	7	5.3
	Primary, 1-8	23	17.6
	Secondary (9-12)	48	36.6
	First degree and above	50	38.2
Employment	Employed	68	51.9
	Merchant	2	1.5
	Farmer	2	1.5
	Daily laborer	1	.8
	Student	13	9.9
	Housewife	22	16.8
	Unemployed	23	17.6
Family history	Yes	5	3.8
	No	120	91.6

	Unknown	6	4.6
Residence	Rural	10	7.6
	Urban	121	92.4
Smoking	Never smoked	127	96.9
	Ex-smoker	2	1.5
	Current smoker	2	1.5

Clinical characteristics

Of the 131 IBD patients, 105 (80.2%) were Crohn's disease and 26(19.8%) were ulcerative colitis. Majority of them were in remission (84%); whereas mild, moderate and severe disease were reported in 9.9%, 5.3% and 0.8% respectively. About 8 percent (8.3%) of them has had extraintestinal manifestations, majority were musculoskeletal involvement (arthritis, arthralgia), no ocular involvement.

Among the 105 Crohn's disease patients 41.90% were Montreal B1 (non stricturing and non-penetrating, 28.57% B2 (stricturing), 27.62% B3 (penetrating) and 1.9% with peri anal involvement. Ileal (L1), ileocolonic (L2) and colonic locations of crohn's disease were 34.29%, 6.67% and 57.14% respectively and two patients has had upper GI involvement (1.9%). Ninety one percent of CD were in remission and 6.67% has had mild disease activity, only the remining 2.85% has had moderate and severe disease.

Montreal E1, E2 and E3 ulcerative colitis were 30.77%, 42.31% and 26.92% respectively and 53.85% were in remission while 23.08% and 19.23% were having mild and moderate disease activity respectively.

Twenty-eight (21.4%) IBD patients has had hospital admission and surgery was done for 21(16%) in the last one year. Regarding their treatment, 92.38% of the patients were taking azathioprine and 16% were taking additional prednisolone, where as 5.4% (n=5) were taking MTX, 11 (8.39%) on 5-ASA and 2.3% (n=2) were no on treatment. Among those on medications, 9.9% (n=13) of them have had adverse consequences of the treatment; leucopenia (5.34%, n=7), steroid induced side effects (2.29%, n=3), dyspepsia (2.9%. n=3) and adrenal insufficiency (0.8%, n=1). Among those taking one or more the treatments, 26% has had low adherence and 74% has had medium and high adherence rates based on modified Morinsky adherence score 8 (MMAS8).

Twenty-six (19.8%) of IBD patients has had comorbidity and based on Charlson comorbidity score (CCI), mild, moderate and severe scores were 6.9%, 3.8% and 1.5% respectively.

Median duration of IBD was 3 years and duration less than one year were 19.8%, 1-3 years was 34.4%, 3-5 years was 22.9% and more than 5 years was 22.9%. Seventy five percent, 22.1% and 3.1% has had symptoms before diagnosis for less than one year, 1-5 years and more than 5 years respectively (table 2).

Table 2: Clinical characteristics of IBD patients at Tikur Anbessa Specialized Hospital, Ethiopia, February 2024

		Frequency	Percent
IBD type (n=131)	Crohn's disease	105	80.2
	Ulcerative Colitis	26	19.8
IBD activity (n=131)	Remission	110	84.0
	Mild disease	13	9.9
	Moderate disease	7	5.3
	Severe disease	1	.8
CD behavior (n=105)	B1- Non stricturing and non penetrating	44	41.90
	B2-stricturing	30	28.57
	B3-Penetrating	29	27.62
	p-Peri anal disease modifier	2	1.9
CD location (n=105)	L1-Ileal	36	34.29
	L2-Colonic	7	6.67
	L3- ileocolonic	60	57.14
	L3+L4	1	0.95
	L4+L1	1	0.95
CD (n=105) disease activity	Remission	96	91.43
	Mild disease	7	6.67
	Moderate disease	2	1.9
	Severe activity	1	.95

UC (n=26) type (montreal)	E1- Ulcerative proctitis	8	30.77
	E2- Left sided UC (distal UC)	11	42.31
	E3- Extensive UC (pan colitis)	7	26.92
UC (n=26) disease activity	Remission	14	53.85
	Mild activity	6	23.08
	Moderate activity	5	19.23
	Severe activity	1	3.85
EIM (n=131)	Yes	11	8.4
	No	120	91.6
Hospital admissions in last 1 year	Yes	28	21.4
	No	103	78.6
Surgery in last 1 year	Yes	21	16.0
	No	110	84.0
Treatment	None	3	2.3
	5-ASA	5	3.8
	MTX	5	3.8
	Azathioprine	91	73.28
	Prednisolone +AZA	21	16.0
	5-ASA + AZA	4	3.1
	5-ASA + MTX	2	1.6
ADRs	No	118	90.1
	Yes	13	9.9
ADRs	None	118	90.1
	Steroid induced (cushingoid, DM, osteoporosis)	2	1.5
	Leukopenia	6	4.6
	Dyspepsia	3	2.3
	Adrenal insufficiency	1	.8

	Steroid induced + cytopenia	1	.8
MMAS8	Low adherers	34	26.0
	Medium and High adherer	97	74.0
CCI	No comorbidity	115	87.8
	Mild	9	6.9
	Moderate	5	3.8
	Severe	2	1.5
Comorbidity	Yes	26	19.8
	No	105	80.2
Duration of IBD in years	0-1 yeas	26	19.8
	1-3 years	45	34.4
	3-5 years	30	22.9
	>5 years	30	22.9
Symptom duration before diagnosis	Less than 1 year	98	74.8
	1- 5 years	29	22.1
	Above 5 years	4	3.1
HRQOL	Good QOL	90	68.7
	Impaired QOL	41	31.3

HRQOL and MMAS8

Median SIBDQ and MMS8 was 53 (± 9) and 7 (±2.25) respectively. Thirty one percent (n=41) of the IBD patients has had impaired QOL (SIBDQ<50) and 68.7% has had good QOL (SIBDQ≥50).

Among the four domains of the SIBDQ, systemic domain was severely affected followed by social, emotional and bowel symptoms with median scores of 10 (±3), 13 (±3), 13 (±3) and 19 (±2) respectively (table 3).

Table 3: SIBDQ domains of IBD patients at Tikur Anbessa Specialized Hospital, Ethiopia 2024

SIBDQ domains (n= 131)	Median (IQR)
Systemic symptoms	10 (±3)
Social symptoms	13 (±3)
Bowel symptoms	18 (±3.0)
Emotional symptoms	13 (±2.0)

HRQOL and predictors (see table 4)

Unemployment, more than 6 months symptoms before diagnosis, age >35, presence of EIM, hospital admissions in last one year, presence of comorbidity, taking steroid, lower adherence to treatment, and not being in remission were selected during univariate regression based on the p value (≤ 0.25) for multivariate regression.

During multivariate binary logistic regression model, being unemployed (AOR 4.36 CI 95% 1.34-14.18, p=0.014), > 6 months symptoms before diagnosis (AOR 4.679, CI 95% 1.31-16.74), P=0.018, hospital admission in last one year (AOR=5.08; 95% CI 1.45-17.76, p=.011), presence of comorbidity (AOR 9.18 CI 95% 2.24-37.69, p=0.002), and not being in remission (AOR 14.62 CI 95% 2. 31-92.53, p= 0.004) has statistically significant association with impaired HRQOL.

Age below 35 (AOR 2.15 CI 95% 0.64-7.21, p=0.215), presence of extraintestinal manifestations (AOR 1.84 CI 95% 0.26, 12.84, p=.537), being on steroid (AOR 4.07 95% CI 0.89-18.62, p= 0.070) and having low adherence for treatment (AOR 1.17 95% CI 0.35-3.91, p=0.800) were associated with non-statistically significant impaired HRQOL.

How ever, HRQOL was not affected by gender, educational status, residence, smoking, family history of IBD, type of IBD, duration of IBD, surgery and adverse drug effect of treatment.

Table 4:Univariate and multivariate analysis of predictors of HRQOL in IBD patients at Tikur Anbessa specialized Hospital, Ethiopia 2024

Item	Variables	HRQOL		COR (95%CI)	*P-value*	AOR (95%CI)	*P-value*
		Impaired	Good				
Gender	Male	11	32	1			
	Female	30	58	1.505(0.67, 3.39)	0.326		
Job status	Employed	16	52	1			
	Unemployed	17	23	2.40(1.04, 5.57)	*.041*	4.36(1.34, 14.18)	*.014*
Family history	No	39	88	1			
	Yes	2	2	1.49(0.24, 9.26)	.671		
Education level	Primary and below	9	24	1			
	Secondary and above	32	66	1.29(0.54, 3.10)	.565		
Marital status	Married	19	40	1.08(0.51, 2.27)	.840		
	Not married	22	50	1			
Residence	Urban	39	82	1.90(0.39, 9.38)	.430		
	Rural	2	8	1			
Cigarette Smoking	Non smoker	39	88	1			
	Smoker	2	2	2.26(0.31,16.60)	.424		
Symptoms before diagnosis	Less than 6 months	17	47	1			
	6 months and above	24	43	1.54(0.73, 3.26)	*.250*	4.679(1.31, 16.74)	*.018*
Age of patient	< 35 years	28	48	1.89(.87, 4.10)	*.110*	2.15(0.64, 7.21)	*.215*
	≥ 35 years	13	42	1			
IBD type	Crohn's disease	31	74	1			
	Ulcerative Colitis	10	16	1.49(0.61, 3.65)	.381		
Extra intestinal manifestations	Yes	6	5	2.91(0.83,10.18)	*.094*	1.84(.26, 12.84)	*.537*
	No	35	85	1			
Hospital admissions in last 1 year	Yes	12	16	1.914(0.81,4.54)	*.140*	5.08(1.45, 17.76)	*.011*
	No	29	74	1			
Surgery in last 1 year	Yes	8	13	1.44(0.54, 3.79)	.465		
	No	33	77	1			
IBD Treatment	No steroid	28	77	1			
	Steroid	12	9	3.67(1.40, 9.64)	*.008*	4.07(0.89, 18.62)	*.070*
MMAS8Class	Low adherers	14	20	1.82(0.80, 4.10)	*.152*	1.17(0.35, 3.91)	*.800*

	Medium and High adherer	27	70	1			
IBD disease activity	Remission	28	82	1			
	No Remission	13	8	4.76(1.79,12.68)	*0.02*	14.62(2. 31,92.53)	*.004*
Duration IBD	<= 3 years	22	49	1			
	Above 3 years	19	41	1.03(0.49, 2.17)	.933		
ADRs	No	38	80	1.58(0.41, 6.09)	.504		
	Yes	3	10	1			
Comorbidity	Yes	12	14	2.25 (0.93, 5.43)	*.072*	9.18(2.24, 37.69)	*.002*
	No	29	76	1			

HRQOL in CD

Being admitted in last one year (AOR 5.15 CI 95% 1.34-19.82, p=0.017), being on steroid (AOR 8.42 CI 95% 1.52-46.54, p=0.015), having comorbidity (AOR 4.73 CI 95% 1.03-21.75, p-value 0.046) and unemployment (AOR 3.66 CI 95% 1.03-12.98, p=0.045) were significantly associated with poor HRQOL among Crohn's disease patients. Primary school and below (AOR 7.10 CI 95% 0.83-60.70, p=0 .073), being symptomatic for > 6 months before diagnosis (AOR 3.45 CI 95% 0.85-13.96, p=0.083), presence of EIM (AOR 1.66 CI 95% 0.24-11.36, p=0.603), not being in remission (AOR 9.92 CI 95% 0.72-137.66, p=0.087) were associated with impaired HRQOL with non-statistical significance. HRQOL was not affected by the disease behavior or location among Crohn's disease patients (table 5).

Table 5:Predictors of HRQOL among CD patients at Tikur Anbessa specialized Hospital, Ethiopia February 2024

Item	Variables	**HRQOL**		COR (95%CI)	P-value	AOR (95%CI)	P-value
		Impaired	Good				
Educational level	Primary and below	4	21	2.01(0.62, 6.56)	.25	7.10(0.83, 60.70)	.073
	Secondary and above	27	84	1			
Symptoms before diagnosis	Less than 6 months	10	36	1			
	6 months and above	21	38	1.99(0.83, 4.79)	.126	3.45(0.85, 13.96)	.083

Extra intestinal manifestations	Yes	5	4	3.37(0.84, 13.51)	.087	1.66(0.24, 11.36)	.603
	No	26	70	1			
Hospital admissions in last 1 year	Yes	12	16	2.29(0.92, 5.69)	.075	5.15(1.34, 19.82)	.017
	No	19	58	1			
IBD Treatment	No steroid	22	66	1			
	Steroid	9	5	5.40(1.64, 17.84)	.006	8.42(1.52, 46.54)	.015
IBD disease activity	Remission	25	71	1			
	No Remission	6	3	5.68(1.32, 24.43)	.020	9.92(0.72,137.66)	.087
Comorbidity	Yes	13	9	1.92(0.72, 5.1)	.192	4.73(1.03, 21.75)	.046
	No	61	22	1			
Job status	Employed	13	42	1			
	Unemployed	12	20	1.94(0.75, 5.00)	.171	3.66(1.03, 12.98)	.045
CD behavior	B1- non structuring and non penetrating	12	32				
	B2-stricturing	11	19	1.02(0.36, 2.90)	0.98		
	B3-Penetrating	8	21				
	p-Peri anal disease modifier	0	2				
Location of CD	L1-Ileal	13	23				
	L2-Colonic	1	6	0.64 (1.57,1.57)	0.331		
	L3- ileocolonic	16	44				
	L3+L4	0	1				
	L4+L1	1	0				

No sociodemographic or clinical variable was associated with HRQOL status among ulcerative colitis patients, mainly due to small number of events (table 6)

Table 6: Predictors of HRQOL among UC patients at Tikur Anbessa specialized Hospital, Ethiopia 2024

Item	Variables	**HRQOL**		COR (95%CI)	P-value	AOR (95%CI)	P-value
		Impaired	Good				
IBD disease activity	Remission	3	11	1		------	------
	No Remission	7	5	5.13(0.92,28.57)	.062		
Comorbidity	Yes	3	1				
	No	7	15				
Job status	Employed	3	10	5.56(0.81,38.16)	.081		
	Unemployed	5	3	1			
Type of ulcerative colitis	E1- Ulcerative proctitis	5	3	1			
	E2- Left sided UC (distal UC)	3	8	4.44(0.63,31.29)	.134		
	E3- Extensive UC (pan colitis)	2	5	4.17(0.47,36.74)	.199		
Age classification	Below 35 years	7	6	1			
	>= 35 years	3	10	3.89(0.72, 21.06)	.115		

6 Discussion and conclusion

6.1 Discussion

Median ISBDQ score in our study was less than a study done at Singapore (53±9 vs 55.7±10.4)(66). Prevalence of impaired health related quality of life of IBD patients in our the study population was smaller than that Italian Cohort of patients (31% vs 52%) and prospective study in Brazil (31% vs 48.3%) (67, 68).

Educational level is associated with better HRQOL in IBD patients which can be explained by the ability to obtain more information, greater knowledge of the possible complications of the illness and natural course of their illness and a lower level of anxiety. HRQOL was negatively affected by low educational level (primary and below) in our study, with similar results in other studies in Brazil and Singapore ($p<0.05$) (69, 70).

Age and gender have variable effects on HRQOL in IBD patients. Gender did not affect the HRQOL in our study with similar results in other studies(68, 71). Female gender was associated with poor HRQOL, usually due to high emotional and bowel symptoms in some studies(72-78).In few other studies women had overall better QOL than men(71, 79, 80).

CD affected HRQOL more than UC in IBD patients in some studies, in some other studies HRQOL was not significantly affected by type of IBD (66, 81)

Older age and longer duration of illness are commonly associated with impaired HRQOL; the older the patient/the longer the duration of illness, the more likelihood the patient will develop complications, surgeries and comorbidities and this will ultimately affect the HRQOL in IBD patients.

Surgery in IBD patients has variable effect on their HRQOL. In the immediate post operative period it improves the HRQOL of CD, but in the long run patients will have poor HRQOL which is consistent with its nature of recurrence. In UC, HRQOL depends on the surgical outcome i.e pouch function and post OP complications. HRQOL in our study was not significantly affected among those with previous surgery. Previous surgery was associated with poor HRQOL in other studies AOR 3.53 CI 95% 1.218–10.204, p = 0.021))(67). In our investigation, the non-significant change in QoL after surgery might be due to, surgically treated patients would get improve in some

of the symptoms, on account surgery is usually done for complications and medically unresponsive severe IBD.

Long duration of illness (> 5 years), age< 35, un-employment and hospitalization in last one year were linked to poor HRQOL in our study with similar outcomes in other studies (42, 66, 69, 70, 82). The longer the duration of IBD diagnosis, the more the patient is familiarized with the condition and lower anxiety, however complications of IBD come with longer duration of illness. Hospitalizations are due to complications of IBD or relapses which greatly has an impact on the quality of life.

Steroid use has also inconsistent relation with HRQOL; steroid use is given for patients with relapse and higher disease activity and these patients tend to have impaired QoL, but in some studies it has HRQOL was better in those taking steroids than those who don't (83)

Presence of extraintestinal manifestations, presence of comorbidity and steroid use was associated with impaired HRQOL in our study. Similar study done in Singapore showed similar results(66). In Germany IBD patients SIBDQ score was significantly associated with EIM and smoking(84).

In our study marital status and smoking were not associated with impaired HRQOL, consistent with the prospective 10-year study in Norway of Ulcerative colitis patients(83)

Cigarette smoking was associated with impaired HRQOL(42, 84-87) in both UC and CD due to increased cost, increased disease activity, increased bowel and emotional symptoms.

Active disease (being not in remission) was associated with impaired HRQOL in our study, which is true in other similar studies (70, 88)

Which domain of the SIBDQ is predominantly affected is variable in different types of IBD and gender. In our study systemic symptoms were affected more followed by social and emotional symptoms and bowel symptoms were least affected, in both UC and CD.

In Crohn's disease patients, disease activity, educational level, duration of symptoms before diagnosis, extra intestinal manifestations were connected with poor HRQOL which was not statistically significant. Whereas disease behavior and location of CD were not connected with HRQOL.

Most of the variables linked with lower HRQOL in IBD are also associated with poor HRQOL in Ulcerative colitis.

There was no sociodemographic or clinical variable which was significantly associated with impaired HRQOL in ulcerative colitis patients, mainly due to the small number of sample size in this sub group of patients and small occurrence of these variables.

6.2 Conclusion

In our study, about one in three of IBD patients had impaired HRQOL, affected by mainly their systemic symptoms and social symptoms. QoL in IBD is far more than the biology of disease and bowel symptoms only. Better HRQOL was achieved in those with controlled disease activity, no recent hospitalization, no other comorbidity, longer duration of symptoms before diagnosis, higher educational level and with no extra intestinal manifestations and those with employment.

7 Recommendations

Our research has revealed some important new information regarding the detrimental effects of limited access to biological treatments and delayed presentation on the poor quality of life that people with inflammatory bowel disease (IBD) endure. This study advises medical professionals to prioritize early detection and prompt intervention for individuals with IBD. Through the use of awareness campaigns and ongoing education programs, healthcare facilities can enhance their capacity to recognize the symptoms of inflammatory bowel disease (IBD) and encourage timely referrals for diagnosis and treatment. The study also made a strong recommendation to patient support groups and health equity advocators to raise the voices of IBD patients and fight for equitable access to supportive care and biological treatments. The study recommended to the policymakers to develop and implement polices that address the unique needs of individuals with IBD, including expedited access to biological treatments and measures to reduce the duration of time before diagnosis.

Finally, researchers and research funders are advised to support funding for research initiatives aimed at improving the diagnosis, care, and quality of life for individuals with inflammatory bowel disease (IBD). It is feasible to create a more effective and compassionate healthcare system by investing in state-of-the-art therapeutic modalities, psychosocial support services, and medical facilities.

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Annexes

Questionnaire

Annex I: Declaration

I, the undersigned, declare that this postgraduate thesis is my original work, has not been presented for a degree in this or any other university and that all sources of material used for the thesis have been duly acknowledged.

Postgraduate Candidate: Asrat Berihun (MD, Internal Medicine Resident)

Signature: …….

Date of Submission:

This thesis has been submitted with my approval as advisor.

Advisor: Abdulsemed Mohammed (MD, Internist, Gastroenterologist)

Signature: …….

Date: …….

Place: Addis Ababa, Ethiopia

Annex II: Information Sheet

This questionnaire is designed to assess health related quality of life in patients with Inflamatory bowel disease (IBD) at Tikur Anbesa Specialized Hospital. All the respondents are kindly requested to fill all the questions below. This questionnaire will serve as a tool to collect the necessary data for my research entitled 'Assessment of Health Related Quality of Life in Patients with Inflammatory Bowel Disease'.

Benefits and risk

Participating in the study does not involve risks. Your participation in this research may not give you direct benefit but your participation will help us understand the quality of life in patients with IBD and identify the factors of poor HRQOL. If you have any questions about the research and your rights, you may contact the investigator:

Asrat Berihun (MD) Tel. +251-913-98-76-55

Email**:**asratb112@gmail.com

Annex III: Informed consent

Dear------(participants)!

Good day! I am here to study about health related quality of life in patients with inflammatory bowel disease and you are chosen to participate in this study.

The purpose of this study is to generate important information on health related quality of life in patients with

inflammatory bowel disease and also to identify the determinant factors of HRQOL. Confidentiality is strictly protected and none of your response will be reported separately. Therefore, there is no need to write your names or ID numbers on these questionnaires. It is your right to participate or to refuse in this study. So please take a few minutes to answer to the questions.

Are you willing to participate in this study? Put "X" mark in the box you chosen. Yes:_____No_____

Annex IV: Questionnaire

No	Questions	Responses	Code
Part I: Socio demographics and behavioral factors			
101	Age	(in years):_____	
102	Marital status:	1. Married 2. Divorced 3. Single 4. Widowed	
103	Gender:	1. Male 2. Female	
104	Educational status	1. Can't read and write 2. Can read and write 3. Primary [1-8] 4. Secondary school (9-12) 5. First degree and above	
105	Employment	1. Employed 2. Merchant 3. Farmer 4. Daily Laborer 5. Student 6. House wife 7. Other [specify]____	
106	Family history of IBD	1. Yes 2. No 3. Un known	
107	Residence	1. Rural 2. Urban	
108	Cigarette smoking	1. Never smoked (<100 cigarettes in his/her life time) 2. Former smoker (>=100 cigarettes but quit before disease onset and did not later resume smoking)	

		3. Currently smoker (>= 100 cigarettes, those who continued to smoke or initiated smoking after disease onset)	
Part II: clinical characteristics			
201	Duration of illness:	_____ months	
202	Duration of symptoms before diagnosis	_____ months	
203	Age at diagnosis in	:_____years	
204	Type if IBD	1. Crohn's disease 2. Ulcerative colitis 3. Un determined	
206	If crohn's disease, what is the behavior of the disease?	1. B1- non structuring and non penetrating 2. B2- stricturing 3. B3-Penetrating 4. P- peri-anal disease modifier (added to B1-B3 when concomitant peri anal disease is present)	
207	If CD, where is the location?	1. L1- ileal 2. L2-Colonic 3. L3- Ileocolonic 4. L4- Isolated upper disease (modifier that can be added to L1-L3 when concomitant upper GI disease is present)	
208	Activity of crohn's disease	CDAI _____ (0-600)	
209	If ulcerative colitis; which type	1. E1- Ulcerative proctitis 2. L2- Left sided UC (distal UC) 3. L3- Extensive UC (pan colitis)	
210	Disease activity of U.C;	Mayo score_____ (0-12)	
	If no recent endoscopy- SCCAI	SCCAI score_____ (0-19)	
211	Extra intestinal manifestations if no go to question no 212	1. Yes_____ 2. No_____	
	Arthritis/arthropathy .	2. Yes_____ 2. No_____	
	Ocular		
	Uveitis	1. Yes_____ 2. No_____	
	Episcleritis	1. Yes_____ 2. No_____	
	Skin		
	Pyoderma gangrenosum	1. Yes_____ 2. No_____	
	Erythema nodusum	1. Yes_____ 2. No_____	
	Hepatobiliary	1. Yes_____ 2. No_____	

	Autoimmune hepatitis	1. Yes_____ 2. No____	
	Primary sclerosing cholangitis	1. Yes_____ 2. No_____	
	Thromboembolism	1. Yes_____ 2. No_____	
	Others, if yes specify____-	1. Yes_____ 2, No_____;	
212	Hospital admissions in last 1 year	1. Yes_____2. No	
213	Surgery in last 1 year	1. Yes_____ 2. No How many times_____	
216	What treatment is he/she on?	1. None 2. 5-ASA 3. Methotrexate 4. Prednisolone 5. Azathioprine 6. Biologics	
217	Encountered side effects of drug (s) used	1. Steroid induced (Cushingoid, DM, Osteoporosis) 2. Cytopenias from AZA/MTX 3. Hepatotoxicity 4. Others _____	

215	**Co morbidities (click on the responses)**				
		Yes	No	Weight	
	Prior Myocardial Infarction			1	
	Congestive Heart Failure			1	
	Peripheral Vascular Disease			1	
	Cerebrovascular Disease /TIA			1	
	Chronic Obstructive Pulmonary Disease			1	
	Dementia/chronic cognitive deficit			2	
	Paraplegia and Hemiplegia			2	
	Diabetes			1	
	Diabetes with Complications			2	
	Renal Disease- Moderate to severe renal disease			2	
	Mild Liver Disease			2	
	Moderate or Severe Liver Disease			3	
	Peptic Ulcers			1	
	Connective tissue disease			1	
	HIV/AIDS			6	
	Malignancy-localized solid tumor			2	
	Leukemia			2	
	Lymphoma			2	

	Malignancy-metastatic Solid Tumor			6	
	Total score				
218	**Modified Morisky Adherente Scale (MMAS-8) for IBD**				
	1. Do you sometimes forget to take your IBD medication?	1. Yes_____ 2. No_____			
	2. People sometimes miss taking their medications for reasons other than forgetting. Thinking over the past two weeks, were there any days when you did not take your medication?	1. Yes_____ 2. No_____			
	3. Have you ever cut back or stopped taking your medication without telling your doctor because you felt worse when you took it?	1. Yes_____ 2. No_____			
	4. When you travel or leave home, do you sometimes forget to bring along your IBD medication?	1. Yes_____ 2. No_____			
	5. Did you take your IBD medicine yesterday?	1. Yes_____ 2. No_____			
	6. When you feel like your IBD symptoms are under control, do you sometimes stop taking your medication?	1. Yes_____ 2. No_____			
	7. Taking medication every day is a real inconvenience for some people. Do you ever feel stressed about sticking to your IBD treatment plan?	1. Yes_____ 2. No_____			
	8. How often do you have difficulty remembering to take all your IBD medication?	1. Never/rarely 2. Once in a while 3. Sometimes 4. Usually 5. Always			
Part III	**SIBDQ** This questionnaire is designed to find out how you have been feeling during the last 2 weeks. You will be asked about symptoms you have been having as a result of your inflammatory bowel disease, the way you have been feeling in general, and how your mood has been. Please check the box of your choice below each question.				
301	How often has the feeling of fatigue or being tired and worn out been a problem for you during the past 2 weeks?	1. All of the time 2. Most of the time 3. A good bit of the time 4. Some of the time 5. A little of the time 6. Hardly any of the time 7. None of the time			

302	How often during the last 2 weeks have you delayed or canceled a social engagement because of your bowel problem?	1. All of the time 2. Most of the time 3. A good bit of the time 4. Some of the time 5. A little of the time 6. Hardly any of the time 7. None of the time	
303	As a result of your bowel problems, how much difficulty did you experience doing leisure or sports activities during the past 2 weeks?	1. A great deal of difficulty; activities made impossible 2. A lot of difficulty 3. A fair bit of difficulty 4. Some difficulty 5. A little difficulty 6. Hardly any difficulty 7. No difficulty; the bowel problem did not limit sports or leisure activities	
304	How often during the past 2 weeks have you been troubled by pain in the abdomen?	1. All of the time 2. Most of the time 3. A good bit of the time 4. Some of the time 5. A little of the time 6. Hardly any of the time 7. None of the time	
305	How often during the past 2 weeks have you felt depressed or discouraged?	1. All of the time 2. Most of the time 3. A good bit of the time 4. Some of the time 5. A little of the time 6. Hardly any of the time 7. None of the time	
306	Overall, in the past 2 weeks, how much of a problem have you had with passing large amounts of gas?	1. A major problem 2. A big problem 3. A significant problem 4. Some problem 5. A little trouble 6. Hardly any trouble 7. No trouble	

307	Overall, in the past 2 weeks, how much of a problem have you had maintaining or getting to the weight you would like to be?	1. A major problem 2. A big problem 3. A significant problem 4. Some problem 5. A little trouble 6. Hardly any trouble 7. No trouble	
308	1. How often during the past 2 weeks have you felt relaxed and free of tension?	1. All of the time 2. Most of the time 3. A good bit of the time 4. Some of the time 5. A little of the time 6. Hardly any of the time 7. None of the time	
309	2. How much of the time during the past 2 weeks have you been troubled by a feeling of having to go to the bathroom even though your bowels were empty?	1. All of the time 2. Most of the time 3. A good bit of the time 4. Some of the time 5. A little of the time 6. Hardly any of the time 7. None of the time	
310	How often during the past 2 weeks have you felt angry as a result of your bowel problem?	1. All of the time 2. Most of the time 3. A good bit of the time 4. Some of the time 5. A little of the time 6. Hardly any of the time 7. None of the time	

Amharic Version of the Questionnaire

መረጃ

ይህ መጠይቅ በጥቁር አንበሳ ስፔሻላይዝድ ሆስፒታል ለ 'አንጀት መቆጣት/ቁስለት ታማሚዎች ከጤና ጋር የተያያዘ የህይወት ጥራትን ለመገምገም የተነደፈ ነው። ሁሉም ምላሽ ሰጪዎች ከታች ያሉትን ሁሉንም ጥያቄዎች እንዲሞሉ በአክብሮት ተጠይቀዋል። ይህ መጠይቅ 'የጤና ተያያዥነት ያለው የኑሮ ጥራት ግምገማ ለአንጀት መቆጣት/ቁስለት ታማሚዎች' በሚል ርዕስ ለጥናቱ አስፈላጊውን መረጃ ለመሰብሰብ እንደ መሣሪያ ሆኖ ያገለግላል።

<u>ጥቅም እና አደጋ</u>

በጥናቱ ውስጥ መሳተፍ አደጋዎችን አያካትትም. በዚህ ጥናት ውስጥ ያለዎት ተሳትፎ ቀጥተኛ ጥቅም ላይሰጥዎት ይችላል ነገር ግን የእርስዎ ተሳትፎ ኢንፍላማቶሪ የአንጀት በሽታ/(መቆጣት/ቁስለት) ያለባቸውን ታካሚዎች የህይወት ጥራት እንድንገነዘብ እና የደካማ ከጤና ጋር የተያያዘ የህይወት ጥራትን ምክንያቶችን እንድንለይ ይረዳናል። ስለ ጥናቱ እና ስለመብቶችዎ ማንኛቸውም ጥያቄዎች ካሉዎት፣ ተመራማሪውን ማነጋገር ይችላሉ፡-

አስራት በሪሁን (ዶ/ር) ስ.ቁ. + 251-913-98-76-55

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አባሪ III፡ በመረጃ የተደገፈ ስምምነት

ውድ ---------- ተሳታፊዎች)!

እንደምን ዋልክ! እኔ እዚህ የመጣሁት የአንጀት መቆጣት/ቁስለት በሽታ ባለባቸው ታማሚዎች ከጤና ጋር የተያያዘ የህይወት ጥራትን ለማጥናት ነው እና እርስዎ በዚህ ጥናት ላይ እንዲሳተፉ ተመርጠዋል።

የዚህ ጥናት አላማ ኢንፍላማቶሪ (መቆጣት/ቁስለት) አንጀት በሽታ ባለባቸው ታማሚዎች ከጤና ጋር ተያያዥነት ባለው የህይወት ጥራት ላይ ጠቃሚ መረጃ ማመንጨት እና እንዲሁም የHRQOLን መወሰኛ ምክንያቶችን መለየት ነው። ምስጢራዊነት በጥብቅ የተጠበቀ ነው እና የትኛውም ምላሽዎ በተናጠል ሪፖርት አይደረግም። ስለዚህ በእነዚህ መጠይቆች ላይ የእርስዎን ስም ወይም መታወቂያ ቁጥር መጻፍ አያስፈልግም። በዚህ ጥናት መሳተፍ ወይም አለመቀበል መብትህ ነው። ስለዚህ እባክዎን ለጥያቄዎቹ መልስ ለመስጠት ጥቂት ደቂቃዎች ይውሰዱ።

በዚህ ጥናት ለመሳተፍ ፈቃደኛ ነህ/ሽ? በመረጡት ሳጥን ውስጥ የ “X” ምልክት ያድርጉ።

አዎ--------- አይ--------

አባሪ IV፡ መጠይቅ

ቁጥር	ጥያቄ	መልስ	መላያ/ኮድ
ክፍል አንድ፡ ስነ-ሕዝብ እና የባህሪ ሁኔታዎች			
101	ዕድሜ (በአመታት):	---------ዓመት	
102	ጾታ፡	1. ወንድ 2. ሴት	
103	የጋብቻ ሁኔታ፡-	1. ያገባ/ች 2. የተፋታ/ች 3. ያላገባ/ች 4. ባል የሞተባት/ሚስት የሞተችበት	

104	የትምህርት ደረጃ	1. ማንበብ እና መጻፍ አይችልም 2. ማንበብ እና መጻፍ ይችላል 3. መጀመሪያ ደረጃ ት/ቤት [1-8] 4. ሁለተኛ ደረጃ ትምህርት ቤት (9-12) 5. የመጀመሪያ ዲግሪ እና ከዚያ በላይ	
105	ሥራ	1. የተቀጠረ 2. ነጋዴ 3. ገበሬ 4. የቀን ሰራተኛ 5. ተማሪ 6. የቤት እመቤት 7. ሌላ [ይግለጹ]_____	
106	የ IBD በቤተሰብ ዉስጥ አለ/ነበር?	1. አዎ 2. አይደለም 3. ያልታወቀ	
107	የመኖሪያ ቦታ	1. ገጠር 2. ከተማ	
108	ሲጋራ አጭሰው ያውቃሉ?	1. በጭራሽ አላጨስም (<100 ሲጋራ በህይወት ዘመኑ) 2. የቀድሞ አጫሽ (>=100 ሲጋራዎች ግን በሽታ ከመከሰቱ በፊት ያቆሙ እና በኋላም ማጨስ አልጀመሩም) 3. በአሁኑ ጊዜ አጫሾች (>= 100 ሲጋራዎች፣ ማጨሳቸውን የቀጠሉ ወይም በሽታ ከጀመሩ በኋላ ማጨስ የጀመሩ)	
የተሻሻለው Morisky Adherente Scale (MMAS-8) ለ IBD			
109	1. አንዳንድ ጊዜ የ IBD መድሃኒትዎን መውሰድ ይረሳሉ?	1. አዎ_____ 2. አይ_____	
	2. ሰዎች አንዳንድ ጊዜ መድሃኒቶቻቸውን ከመርሳት ባለፈ በሌሎች ምክንያቶች ሳይወስዱ ይቀራሉ፤ ባለፉት ሁለት ሳምንታት ዉስጥ መድሃኒትዎን ያልወሰዱባቸው ቀናት ነበሩ?	1. አዎ_____ 2. አይ_____	
	3. የሚወስዱትን መድሃኒትን ሲወስዱ ስለተባባሰብዎ ለሐኪምዎ ሳይናገሩ መድሀኒትዎን ቀንስው ወስደው ወይም አቋርጠው ያውቃሉ?	1. አዎ_____ 2. አይ_____	
	4. ከቤት ሲወጡ ወይም መንገድ ሲሄዱ አንዳንድ ጊዜ የ IBD መድሃኒትዎን ይዘው መሄድ ይረሳሉ?	1. አዎ___ 2. አይ_____	
	5. የ IBD መድሃኒትዎን ትናንት ወስደዋል?	1. አዎ_____ 2. አይ_____	
	6. የ IBD ምልክቶችዎ በቁጥጥር ስር እንደሆኑ ሲሰማዎት አንዳንድ ጊዜ መድሃኒትዎን መውሰድ ያቆማሉ?	1. አዎ_____ 2. አይ___	

	7. በየቀኑ መድሃኒት መውሰድ ለአንዳንድ ሰዎች ምቾት የለውም፤. ከእርስዎ የ IBD ህክምና እቅድን መከትል ጭንቀት እንዲሰማዎት ያደርጋል?	1. አዎ___ 2. አይ_____	
	8. ሁሉንም የ IBD መድሃኒቶችን ለመውሰድ ምን ያህል ጊዜ ለማስታወስ ይቸገራሉ?	1. በጭራሽ/አልፎ አልፎ 2. አንድ ጊዜ 3. አንዳንድ ጊዜ 4. አብዛኛውን ጊዜ 5. ሁልጊዜ	
ክፍል III: SIBDQ ይህ መጠይቅ የተዘጋጀው ባለፉት 2 ሳምንታት ውስጥ ምን እንደተሰማዎት ለማወቅ ነው። በእብጠት የአንጀት በሽታዎ ምክንያት ስላጋጠሙዎት ምልክቶች፣ በአጠቃላይ ስለሚሰማዎት ስሜት እና ስሜትዎ እንዴት እንደነበረ ይጠየቃሉ። እባክዎ ከእያንዳንዱ ጥያቄ በታች በመረጡት ሳጥን ላይ ምልክት ያድርጉ።			
301	1. ባለፉት 2 ሳምንታት ውስጥ የድካም ስሜት ወይም የድካም እና የድካም ስሜት ምን ያህል ጊዜ ለእርስዎ ችግር ሆኖብዎታል?	1. ሁል ጊዜ 2. አብዛኛውን ጊዜ 3. የተወሰነ ጊዜ 4. አንዳንድ ጊዜ 5. ትንሽ ጊዜ 6. በጣም ትንሽ ጊዜ 7. በማንኛውም ጊዜ	
302	ባለፉት 2 ሳምንታት ውስጥ በአንጀት ችግርዎ ምክንያት ማህበራዊ ተሳትፎን ምን ያህል ዘግይተዋል ወይም ሰርዘዋል?	1. ሁል ጊዜ 2. ብዙ ጊዜ 3. የተወሰነ ጊዜ 4. አንዳንድ ጊዜ 5. ትንሽ ጊዜ 6. በጣም ትንሽ ጊዜ 7. በማንኛውም ጊዜ	
303	በአንጀትዎ ችግር ምክንያት ባለፉት 2 ሳምንታት የመዝናኛ ወይም የስፖርት እንቅስቃሴዎችን ለማድረግ ምን ያህል ችግር አጋጥሞዎታል?	1. ትልቅ ችግር; እንቅስቃሴዎች ማድረግ አልቻልኩም 2. ብዙ ችግር 3. ፍትሃዊ የሆነ ችግር 4. አንዳንድ ጊዜ መቸገር 5. ትንሽ ችግር 6. በጣም ትንሽ ችግር 7. ምንም ችግር የለም; የአንጀት ችግር ስፖርቶችን ወይም የመዝናኛ እንቅስቃሴዎችን አልገደበም	

304	ባለፉት 2 ሳምንታት ውስጥ ምን ያህል ጊዜ በሆድ ውስጥ ህመም ተቸግረዋል?	1. ሁል ጊዜ 2. ብዙ ጊዜ 3. የተወሰነ ጊዜ 4. አንዳንድ ጊዜ 5. ትንሽ ጊዜ 6. በጣም ጥቂት ጊዜ 7. በማንኛውም ጊዜ	
305	ባለፉት 2 ሳምንታት ውስጥ ምን ያህል ጊዜ የመንፈስ ጭንቀት ወይም የተስፋ መቁረጥ ስሜት ተሰማዎት?	1. ሁል ጊዜ 2. ብዙ ጊዜ 3. የተወሰነ ጊዜ 4. አንዳንድ ጊዜ 5. ትንሽ ጊዜ 6. በጣም ትንሽ ጊዜ 7. በማንኛውም ጊዜ	
306	በአጠቃላይ፣ ባለፉት 2 ሳምንታት ውስጥ ከፍተኛ መጠን ባለው ጋዝ(የሆድ መነፋት)/ፈስ ምን ያህል ችግር አጋጥሞዎታል?	1. ዋና ችግር 2. ትልቅ ችግር 3. ጉልህ የሆነ ችግር 4. አንዳንድ ችግር 5. ትንሽ ችግር 6. በጣም ትንሽ ችግር 7. ምንም ችግር የለም	
307	ባጠቃላይ፣ ባለፉት 2 ሳምንታት ውስጥ ወደ ሚፈልጉት ክብደት መድረስ ወይም የነበረ ክብደትዎን ለመጠበቅ ምን ያህል ችግር አጋጥሞዎት ነበር?	1. ዋና ችግር 2. ትልቅ ችግር 3. ጉልህ የሆነ ችግር 4. አንዳንድ ችግር 5. ትንሽ ችግር 6. በጣም ትንሽ ችግር 7. ምንም ችግር የለም	
308	ባለፉት 2 ሳምንታት ውስጥ ምን ያህል ጊዜ ዘና ያለ እና ከጭንቀት የጸዳ ስሜት ይሰማዎታል?	1. ሁል ጊዜ 2. ብዙ ጊዜ 3. የተወሰነ ጊዜ 4. አንዳንድ ጊዜ 5. ትንሽ ጊዜ 6. በጣም ጥቂት ጊዜ 7. በማንኛውም ጊዜ	
309	ባለፉት 2 ሳምንታት ውስጥ ምን ያህል ጊዜ አንጀትዎ ባዶ ቢሆንም ወደ መጸዳጃ ቤት የመሄድ ስሜት ተቸግረዋል?	1. ሁል ጊዜ 2. ብዙ ጊዜ 3. የተወሰነ ጊዜ 4. አንዳንድ ጊዜ 5. ትንሽ ጊዜ	

		6. በጣም ትንሽ ጊዜ 7. በማንኛውም ጊዜ	
310	ባለፉት 2 ሳምንታት ውስጥ በአንጀት ችግርዎ የተነሳ የተናደዱበት ጊዜ ምን ያህል ጊዜ ነው?	1. ሁል ጊዜ 2. ብዙ ጊዜ 3. የተወሰነ ጊዜ 4. አንዳንድ ጊዜ 5. ትንሽ ጊዜ 6. በጣም ትንሽ ጊዜ 7. በማንኛውም ጊዜ	