

Original Article

Drug Compliance and Quality of Life in Individuals with Inflammatory Bowel Disease: A Descriptive and Cross-Sectional Study

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Abstract

Background: The incidence of inflammatory bowel diseases (IBD) is increasing. Increasing drug compliance will contribute to the improvement of patients' quality of life.

Objective: This study aimed to explore any possible relationship between drug compliance and quality of life among IBD patients.

Methods: Adopting a descriptive and cross-sectional research approach, this study included a sample of 251 IBD patients meeting our inclusion criteria. The research data were collected through the Participant Information Form, Harvey Bradshaw Index (HBI), Simple Clinical Colitis Activity Index (SCCAI), Morisky, Green, Levine (MGL) Adherence Scale, and Inflammatory Bowel Disease Questionnaire (IBDQ). Research data were analyzed by descriptive statistics, chi-square, Mann Whitney U, and correlation analysis.

Results: Our analyses showed a weak positive but statistically significant correlation between the mean scores from the MGL Scale and IBDQ. Drug compliance was higher among patients who thought that the prescribed medication was not complicated and were aware of appropriate use of daily medication, health effects, and side effects. Patient's health-related quality of life was found to impair as the severity of disease activity increased ($p < 0.05$).

Conclusions: Patients with higher drug compliance can enjoy better quality of life.

Keywords: inflammatory bowel diseases, drug compliance, quality of life

Introduction

Inflammatory bowel disease (IBD) is an umbrella term referring to a group of chronic idiopathic disorders causing inflammation of gastrointestinal tract and mainly including ulcerative colitis (UC) and Crohn's disease (CD), which could exhibit both similarities and differences in terms of their clinical and pathological course (WGO, 2022). IBD affects approximately 11.2 million people worldwide, with a much higher incidence rate in Europe and North America (Malinowski et al., 2020). Corticosteroids, 5-aminosalicylic acids, immunomodulators, biological agents (adalimumab, infliximab, golimumab, vedolizumab and ustekinumab) are commonly used in the treatment of IBD (Wright,

Ding & Niewiadomski, 2018). As with all chronic diseases, the treatment requires prolonged medication use, thus drug compliance is very important in managing the exacerbation periods of the disease (Wright, Ding & Niewiadomski, 2018; Nakase et al., 2021).

Drug compliance is a passive patient behavior where patients are expected to strictly follow the recommendations given by the treating physician. The extent to which the patient follows such advice measures the patient's drug compliance (Vishwanathan & Satishchandra, 2020). In other words, it is defined as how (on empty or full stomach) and at what doses or intervals (once or twice daily) patients take the prescribed medication

(Chang & Lee, 2015; Vishwanathan & Satishchandra, 2020). However, non-compliance or failure to fully comply with the prescribed drug regimen is quite a common occurrence (Lindberg et al., 2008; Hromadkova et al., 2012). Moreover, in long-term treatment for chronic disease, it is estimated that only half of all drug doses are taken as prescribed (Lindberg et al., 2008; Hromadkova et al., 2012). In a study carried out in IBD patients, non-compliance to mesalazine treatment was associated with factors such as male gender, prescription of four or more daily doses, being single, being in remission for two or more years, high number of tablets, and multiple daily doses (Stansfield, 2016). Poor drug compliance, on the other hand, may lead to frequent exacerbation periods, increased health care costs, higher mortality and morbidity rates, and ultimately impaired quality of life (Gracie et al., 2017; Perry et al., 2018).

The World Health Organization (WHO) defines quality of life as “an individual’s perception 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” (WHO, 2022). The treatment of IBD requires constant and meticulous care, the disease inevitably affects the sufferer’s quality of life (Simian et al., 2016).

In fact, the condition is known to bring a considerable psychosocial burden for the patient (Simian et al., 2016; Knowles et al., 2018). The disease may become chronic or follow an unpredictable course, while some symptoms can cause serious disturbance in several aspects of life, including constant tiredness or weakness, poor bowel control, side effects, recurring hospitalization, social isolation, cancer risk, and surgical anxiety (Knowles et al., 2018). Moreover, IBD is a systemic disease that manifests itself not only in the intestinal/gastrointestinal tract, but also in the extraintestinal organs in certain patients (Greuter & Vavricka, 2019). The quality of life of IBD patients can be significantly affected by these extraintestinal manifestations (Rogler et al., 2021), and such symptoms most commonly involve the joints, skin, or eyes, but may also affect other organs like the liver, lungs, and pancreas (Greuter & Vavricka, 2019; Rogler et al., 2021).

Therefore, inflammatory bowel diseases, particularly including Crohn’s disease and ulcerative colitis, are immune-mediated, chronic, recurrent conditions characterized by severe gastrointestinal symptoms that affect psychological, physical, sexual and social functions, significantly impairing patient’s quality of life (Lenti et al., 2020; Fu et al., 2020).

For the above-mentioned disturbances, interventions directed towards the management of IBD should also focus on improving the patient’s health-related quality of life and general well-being, while attempting to achieve better clinical and endoscopic outcomes by treating gastrointestinal symptoms and complications (Colombel, Narula & Biroulet, 2017; Yoon et al., 2017).

In this context, ensuring better drug compliance will surely improve the quality of life in people with IBD (Horvath et al., 2012; Yoon et al., 2017). Even though medication adherence and quality of life have been studied extensively in previous research, we know very little about drug compliance in this patient group (Lönnfors, Vermeire & Avedano 2014; Ho et al., 2019; Fu et al., 2020).

Investigating drug compliance in this patient population will provide valuable data for the relevant literature, helping us to identify barriers to drug compliance and encouraging initiatives towards the promotion of specialized nursing care. Additionally, given that the majority of the IBD patients are going through the most active phase of their lives, the underlying causes of drug compliance or noncompliance may involve multiple factors. If we, nurses as health care professionals, become aware of such complexities, we can come up with viable strategies to tackle these issues, and by supporting patients, we can help raise more awareness.

Therefore, unlike previous studies, this study explored patient characteristics related to medication use and drug compliance among IBD patients presenting to the outpatient clinic. Besides, drug compliance was analyzed according to gender, educational status, occupation, disease type, family history of IBD, patient’s use of complementary and alternative medicine (CAM), certain characteristics of medication use, and health-related quality of life.

Overall, our study aimed to investigate drug compliance and quality of life in individuals with inflammatory bowel disease.

Methods

Study Design: This descriptive, cross-sectional study was designed in line with the guidelines in the STROBE statement.

Participants and Sample Size: The study population consisted of patients diagnosed with IBD presenting to the XXX Medical Faculty Hospital Gastroenterology Department Inflammatory Bowel Diseases Polyclinic between November 2017 and February 2018 and meeting the inclusion criteria. The study sample included patients older than 18 years who were diagnosed with IBD at least 6 months prior, had been using IBD drugs for at least 3 months, could read and write, were not in an acute condition (whose condition was stable), and who voluntarily accepted to participate in the study.

G-Power statistical analysis was performed to determine the sample size, which showed the minimum sample number as 102 people to achieve Cohen's effect size $w=0.5$ with a power of 0.80 and an alpha value of 0.05 ($\alpha = 0.05$). Taking into account a dropout rate of at least 10%, we decided that the sample needed a total of 112 patients. Ultimately, the study was completed with a larger sample of 251 patients.

Measurements

Patient Information Form: Developed by the researchers in accordance with the relevant literature, the Patient Information Form included questions about sociodemographic characteristics of patients, as well as certain aspects of disease, health, and medication use (Lönnfors, Vermeire & Avedano 2014; Ho et al., 2019; Fu et al., 2020; Vishwanathan & Satishchandra, 2020).

Harvey-Bradshaw Index (HBI): Originally developed by Harvey RF and Bradshaw JM in 1980, HBI, also known as Simple Index, is an easy-to-use measurement tool designed to assess the severity of Crohn's disease. Requiring no diary-keeping or laboratory tests, the index simply works by recording five items on a single occasion, which include abdominal pain, general well-being, abdominal mass, systemic complications, and the number of liquid stools per day. HBI scores lower than 5 are interpreted as disease in remission, scores

from 5 to 7 mild disease, 8 to 16 moderate, while scores higher than 16 indicate severe disease (Harvey & Bradshaw, 1980).

Simple Clinical Colitis Activity Index (SCCAI): Created by Walmsley et al. in 1998, SCCAI is a questionnaire commonly utilized to measure the severity of symptoms experienced by patients with ulcerative colitis (UC). SCCAI scores are determined by rating each answer to the questionnaire items as to patient's general health, bowel movement frequency, urgency to evacuate bowels, extracolonic features, and blood in the stool. SCCAI scores lower than 3 are accepted to indicate that UC is in clinical remission (Walmsley, Ayres, Pounder & Allan, 1998).

Morisky, Green, Levine (MGL) Adherence Scale: MGL Medication Adherence Scale was originally developed by Morisky, Green and Levine in 1986 (Morisky, Green & Levine, 1986) and previous research demonstrated its psychometric relevance for the Turkish population (Cronbach's $\alpha = 0.63$) (Yilmaz & Buzlu, 2012). It contains 4 simple questions about a patient's adherence to the medical regimen, eliciting "yes" or "no" replies. Scores from MGL Scale range from 0 to 4, and a patient should answer "yes" to all 4 questions for the patient to be considered compliant, and an answer of "no" to even one question indicates noncompliance with the prescribed medication (Aksoy, 2013). In this study, Cronbach's alpha value of the scale was 0.87.

Inflammatory Bowel Disease Quality of Life Questionnaire (IBDQ): Inflammatory Bowel Disease Quality of Life Questionnaire (IBDQ) was developed to measure the quality of life in patients with inflammatory bowel diseases. It contains multiple-choice questions and it was developed by Guyatt et al. (Guyatt et al., 1989). Its adaptation to the Turkish language was performed by Akçura et al. (Cronbach alpha = 0.95) and the scale was found to be valid and reliable (Akçura & Akpınar, 2015).

The questionnaire consists of 32 items and four sub-dimensions: 10 items for intestinal symptoms, 5 items systemic symptoms, 12 items emotional function and 5 items social function. Each item is scored over 1-7 points, 1 being "worst" and 7 being "best". The highest possible score is 224 and the lowest score is 32. Higher scores indicate better quality of life perceived by the patient (Guyatt et al., 1989). In this study, Cronbach's alpha value of the scale was 0.94.

Data collection procedure: Once the participants were educated about the aims and scopes of the research, a written informed consent was obtained from each participant. In the collection of research data, we used the self-report method, where participants read the questions and selected the response reflecting their situation by themselves without any interference by the researchers. The average time spent completing all questionnaires was about 10 minutes.

Data analysis: The research data were analyzed on the SPSS 22 software package. The sociodemographic characteristics, and other variables including disease-health status, and medication use were shown in numbers and percentages. Numbers, percentages and mean values were used for the disease activity severity. Comparison of drug compliance according to gender, education level, occupation, type of disease, thinking that the drugs used in treatment are complex, knowing the daily use of drugs, knowing the health effects of drugs, knowing the side effects of drugs, using CAM to cure the disease were analyzed by chi-square test. Mann Whitney U test was used to compare mean subscale scores for the IBDQ according to disease type (UC-CD). Correlation analysis was performed to compare the mean scores from IBDQ with respect to mean scores for HBI, SCCAI and MGL scale. In the statistical analysis, a p value lower than 0.05 ($p < 0.05$) was considered significant.

Ethical considerations: A written permission was obtained from XXX University Health Sciences Scientific Research and Publication Ethics Committee (No: 277-2017, Date: October, 2017) and XXX University Hospital (November, 2017-E.281722), where the study was conducted. Necessary permissions were obtained from the original developers of the scales. Written and verbal consent was obtained from each patient participating in the study, and the study was conducted in accordance with the principles of the Declaration of Helsinki.

Results

The mean age of the patients included in the study was 44.60 ± 1.39 years. The proportion of women was higher than men (52.6% vs. 47.4%). Of all participants, 77.3% were married, 35.9% were self-employed and 97.6% had social security. The rate of patients with UC was higher than the rate of patients

with CD (59% vs. 41%). About 85.7% of the patients had no family history of IBD. The rate of those using no prebiotics was 93.6%, and the rate of those following no special diet was 65.3%. Also, 73.3% of the patients reported no tobacco consumption and 92% no alcohol consumption (Table 1).

In the current study, 86.9% of the patients reported receiving mesalazine (mesalamine) therapy, and the majority of them took their drugs via oral route (64.9%). It was determined that the patients had been using drugs for an average of 5.64 ± 4.81 years. About 96.4% stated that the medication used in the treatment was not complicated, and 97.6% reported that they were aware of appropriate use of daily medication. The rate of those who were aware of the side effects was 96.4%. We also found that 6.4% of the patients used complementary and alternative treatment methods, where they consumed bitter melon (*Momordica charantia*), *Hypericum perforatum* oil, parsley, ginger, and propolis. The rate of drug compliance was 70.9%, while the rate of noncompliance was 29.1%. (Table 1).

The mean HBI score of CD patients was 4.3 ± 3.3 . The disease was in remission in 63.1% of the patients, 26.2% had mild disease, 7.8% moderate, and 2.9% very severe disease. Moreover, the mean SCCAI score of UC patients was 5.27 ± 2.67 . About 70.9% of the patients were in exacerbation and 29.1% were in remission (Table 3).

Table 3 shows the comparison of drug compliance according to some independent variables. There was no statistically significant difference between compliant and noncompliant patients in terms of gender, education level, occupation, type of disease, having family history of IBD, and CAM use ($X^2 = 0.528$, $p > 0.05$; $X^2 = 2.573$, $p > 0.05$; $X^2 = 4.989$, $p > 0.05$; $X^2 = 1.961$, $p > 0.05$; $X^2 = 0.340$, $p > 0.05$; $X^2 = 0.587$, $p > 0.05$). However, a statistically significant difference was found between patients complying with the drug regimen and noncompliant patients in terms of certain variables including knowing that the prescribed medication was complex, being aware of how to use the medication on a daily basis and knowing the health effects and side effects of drugs ($X^2 = 6.393$, $p < 0.05$; $X^2 = 4.210$, $p < 0.05$; $X^2 = 8.771$, $p < 0.05$; $X^2 = 10.731$, $p < 0.05$).

The analyses revealed no statistically significant difference between the mean scores of the intestinal

symptoms, systemic symptoms, emotional function and social function subdimensions of the IBDQ and having UC and CD (MWU=6983.5, $p>0.05$; MWU=7087.5, $p>0.05$; MWU=7.344, $p>0.05$; MWU=7.610, $p>0.05$) (Table 4).

Our analyses detected a negative, moderate, and statistically significant relationship between IBDQ

mean scores and HBI scores ($p<0.05$, $r=-0.639$). Also, there was a negative, high and statistically significant correlation between the IBDQ mean scores and SCCAI mean scores ($p<0.05$, $r=-0.762$). Besides, a positive, very weak, statistically significant correlation was found between the mean MGL Scale scores and the IBDQ mean scores ($p<0.05$, $r=+0.196$) (Table 5).

Table 1: Distribution of Patients By Sociodemographic, Disease-Health and Medication Use Characteristics (N=251)

Characteristics	N	%
Mean age (SD)	44.60 (1.39)	
Gender		
Female	132	52.6
Male	119	47.4
Educational Background		
Literate	7	2.8
Primary and secondary school	99	39.4
High school	47	18.8
University and higher education	98	39.0
Marital Status		
Married	194	77.3
Single	57	22.7
Occupation		
Civil servant	48	19.1
Worker	19	7.6
Retired	38	15.1
Self-employed	90	35.9

Housewife	56	22.3
Social Security		
Yes	245	97.6
No	6	2.4
Disease Type		
Ulcerative colitis	148	59.0
Crohn's disease	103	41.0
Time Since Diagnosis (SD)	6.81(5.72)	
Family History of IBD		
Yes	36	14.3
No	215	85.7
Use of Prebiotic Products		
Yes	16	6.4
No	235	93.6
Special Diet		
Yes	87	34.7
No	164	65.3
Tobacco Consumption		
Yes	59	23.5
No	184	73.3
Former smoker	8	3.2
Alcohol Consumption		
Yes	16	6.4
No	231	92.0
Former drinker	4	1.6

Medications Used		
Mesalazine	218	86.9
Azathioprine	64	25.5
Methylprednisolone	10	4.0
Prednisolone	3	1.2
Adalimumab	19	7.6
Infliximab	10	4.0
Vedolizumab	4	1.6
Route of Administration		
Oral	163	64.9
Rectal	20	8.0
Oral and rectal	59	23.5
Intravenous	14	5.6
Subcutaneous	19	7.6
Duration of Medication Use	5.64(4.81)	
Thinking that Prescribed Drugs are Complicated		
Yes	9	3.6
No	242	96.4
Knowing Appropriate Daily Use of Drugs		
Yes	245	97.6
No	6	2.4
Knowing about Side Effects of Drugs		
Yes	242	96.4
No	9	3.6
Use of Complementary and Alternative Medicine (CAM) for IBD		

Yes		
No	16	6.4
	235	93.6
Drug Compliance as Measured by the Scale		
Non-compliant	73	29.1
Compliant	178	70.9

Table 2: Distribution of IBD Patients by Disease Activity Severity

Variables	N	%
CD Patients' (N= 103) HBI Mean Score (SD)		4.3(3.3)
Crohn's Disease Patients		
Remission	65	63.1
Mild disease	27	26.2
Moderate disease	8	7.8
Very Severe disease	3	2.9
UC Patients' (N=148) SCCAI Mean Score (SD)		5.27(2.67)
UC Patients		
Remission	43	29.1
Exacerbation	105	70.9

Table 3: Comparison of Patient Drug Compliance by Independent Variables

Variables	Compliant		Non-compliant		X ²	p
	N	%	N	%		
Gender						
Female	91	68.9	41	31.1	0.528	0.468
Male	87	73.1	32	26.9		

Educational Background						
Literate + Primary school + Secondary school	76	71.7	30	28.3		
High school	29	61.7	18	38.3	2.573	0.276
University and higher education	73	74.5	25	25.5		
Occupation						
Civil servant	37	77.1	11	22.9		
Worker	10	52.6	9	47.4		
Retired	28	73.7	10	26.3		
Self-employed	61	67.8	29	32.2	4.989	0.288
Housewife	42	75	14	25.0		
Disease Type						
Ulcerative colitis	100	67.6	48	32.4		
Crohn's disease	78	75.7	25	24.3	1.961	0.161
Family History of IBD						
Yes	27	75.0	9	25.0		
No	151	70.2	64	29.8	0.340	0.560
Thinking that prescribed drugs are complicated						
Yes	3	33.3	6	66.7		
No	175	72.3	67	27.7	6.393	0.011
Knowing appropriate daily use of drugs						
Yes	176	71.8	69	28.2	4.210	0.040
No	2	33.3	4	66.7		
Knowing about health effects of drugs						
Yes	177	72.2	68	27.8	8.771	0.003
No	1	16.7	5	83.3		
Knowing about side effects of drugs						
Yes	176	72.7	66	27.3	10.731	0.001
No						

	2	22.2	7	77.8		
Use of complementary and alternative medicine (CAM) for IBD						
Yes	10	62.5	6	37.5	0.587	
No	168	71.5	67	28.5		0.444

Table 4: Comparison of IBDQ Subscale Scores by Disease Type (UC-CD)

IBDQ Mean Score (SD)					162.65(29.33)					
Variables	IBDQ Score								U	P
	Ulcerative colitis				Crohn's disease					
	n	Mean	SD	X _{mean} (min-max)	n	Mean	SD	X _{mean} (min-max)		
Intestinal symptoms	148	51.7	8.6	54 (29-69)	103	53.3	7.6	54 (31-70)	6983.5	0.259
Systemic symptoms	148	24.3	4.4	25 (13-34)	103	24.9	4.2	26 (14-33)	7087.5	0.343
Emotional function	148	58.4	12	60 (21-78)	103	59.3	11.5	61 (27-83)	7.344	0.623
Social function	148	26.6	7.3	29 (9-35)	103	27.0	6.4	29 (10-35)	7.610	0.991

Table 5: Comparison of Mean Scores From IBDQ with Mean Scores of Participants from HBI, SCCAI and MGL Adherence Scale

	IBDQ Mean Score	
	r	P

HBI Mean Score	-0.639	<0.001
SCCAI Mean Score	-0.762	<0.001
MGL Scale Mean Score	+0.196	0.002

Discussion

In our study, where we explored drug compliance and quality of life among IBD patients, we found that the rate of noncompliance to the medication regimen was relatively high among our participants. Moreover, comparison of drug compliance according to certain characteristics related to medication use revealed some differences between compliant and noncompliant patients. However, no significant difference was detected between having ulcerative colitis or Crohn's disease and four subdimensions of quality of life (intestinal symptoms, systemic symptoms, emotional function, social function). Overall, the IBD patient's quality of life was found to impair as the disease activity increased, whereas the quality of life improved with better drug compliance.

More than 70% of IBD patients in our study were found to comply with the medication regimen prescribed for their condition (Table 1), which is slightly higher as compared to the compliance rates reported in the relevant literature. For instance, Wentworth et al. (2018) reported that only 66% of their participants with IBD were compliant with their drug therapy, though this rate showed significant variations for individual drug regimens, with adherence to vedolizumab therapy as high as 83%, infliximab treatment 70%, biological therapy of adalimumab 57%, and certolizumab pegol 50%. Furthermore, they also concluded that a greater rate of drug compliance could be achieved if biological therapies were administered by healthcare professionals as compared to self-administration of medications (Wentworth et al., 2018). Similarly, in another study, Lasa et al (2020) found that while drug compliance for self-administered oral medication was only 49.7% among IBD patients, this rate increased to 88.2% among patients receiving treatment involving administration of

biological agents (Lasa et al., 2020). Our findings appear to contradict the results of such previous findings, which could be associated with our relatively smaller sample size and the proportion of patients with UC and DC in the sample. Additionally, our study only investigated overall drug compliance among IBD patients, with no particular focus on the routes of medication administration, namely whether it was self-administered oral tablets or biological therapy injected by a health professional.

We discovered that drug compliance was better among patients who thought that the medications used in the treatment were not complicated. Similarly, patients who were aware of how to use the drugs on a daily basis, their health effects and side effects were found to have greater drug compliance. This finding can be attributed to the fact that our participants had been using IBD drugs for 5.64 ± 4.81 years, with a large number of patients taking their medication via oral route. Besides, even though there is no significant correlation between being male/female and drug compliance, it is known that higher number of female patients in the study and greater noncompliance with mesalazine (mesalamine) therapy in males could affect the results (Stansfield, 2016). However, our study showed no significant correlation between disease type, education, gender, CAM use and drug compliance. Although another study reported results somewhat similar to our findings, the research tools used for measuring drug compliance in that study were different from ours (Horvath et al., 2012) (Table 3).

There was no significant difference between the mean IBDQ subscale scores of patients with ulcerative colitis and Crohn's disease (Table 4). Previous research in the literature seems to support our findings in this context (Zavala-Solares,

Salazar-Salas, & Yamamoto-Furusho, 2021). Although the majority of patients with ulcerative colitis in our study were in exacerbation period, their quality of life scores showed no difference from those of patients with Crohn's disease, which can be explained by the fact that the number of UC patients in this study was higher than that of CD patients, and drug compliance was higher in UC patients.

The quality of life was found to deteriorate among our participants as the incidence of severe symptoms increased (Table 5). According to previous work in the relevant literature, symptoms with most deleterious effects include severe abdominal pain, bloating, and diarrhea among IBD patients, who also complain about serious disruption of their social life because of long walks and intensive physical activity required to sustain remission (Blagden et al., 2013).

For example, Sun Kim et al. (2017) reported that 81% of IBD patients experienced weakness, fatigue, and limitation in their day-to-day activities during the exacerbation periods, while in remission the rate of such complaints decreased to 61%. They also measured the impact of IBD on work and school absenteeism, finding that the symptoms caused work/school absence at an average of 18 days over the first six months following the diagnosis (Sun Kim et al, 2017). Therefore, we can argue that disrupting symptoms of irritable bowel diseases must be kept under check through strict drug compliance in order to prevent deterioration of patient quality of life.

In fact, the analyses in our study revealed that better drug compliance ensured significant improvements in quality of life among IBD patients in our sample ($p < 0.05$) (Table 5). Likewise, Yoon et al. (2017) also reported that higher levels of drug compliance meant better quality of life among their participants (Yoon et al., 2017). The relevant literature indicates that noncompliance with the prescribed medication could be as high as 50% among patients with IBD, which seriously impairs their quality of life, as it often adds to the disease severity and rate of recurrence (Yoon et al., 2017; Soobraty, Boughdady & Selinger, 2017). To the best of our knowledge, there has been limited research to look into drug compliance and quality of life in individuals with inflammatory bowel diseases, and it appears that previous studies tend to focus more on medication

adherence in this patient population. Future studies in this field involving common measurement tools may allow better insight into our findings.

There are certain limitations of this study. First, it was carried out at a single center with outpatients, which limits the generalizability of our findings to a wider population. In addition, the cross-sectional design of our research did not allow further longitudinal discussion of other possible relationships.

Conclusion: Working towards increasing drug compliance among patients with inflammatory bowel diseases affords a potential to improve their quality of life, so future studies are warranted to investigate drug compliance in this population in a more detailed manner. Healthcare professionals should advise patients not to discontinue using medication even when the symptoms appear to improve, and further research should look into possible obstacles that may hinder drug compliance. Management of IBD symptoms through medication requires a multidisciplinary approach, and nurses specializing in the care of IBD could play a key role in this regard.

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