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Research Article:

Effect of Pharmacist-Provided Patient Education on Self-Care Practices and Satisfaction with Biologic Therapy among Patients with Ulcerative Colitis

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Abstract

Background: Pharmacists play a significant role in the management of Ulcerative Colitis (UC). Pharmacist-provided patient education may improve self-care practices and treatment satisfaction among patients receiving chronic medications for UC. **Objective:** To evaluate the impact of pharmacist-provided patient education on self-care practices and treatment satisfaction among UC patients. **Methods:** A quasi-experimental, controlled study was conducted among UC patients who attended the Gastroenterology and Hepatology Teaching Hospital in Medical City Complex/Baghdad. A total of 95 patients were enrolled: 48 in the intervention group who received pharmacist-provided education and 47 in the control group who received standard care. Patients were assessed at baseline and after two months. The Arabic versions of the Self-Care of Chronic Illness Inventory (SC-CII) and the Treatment Satisfaction Questionnaire for Medication (TSQM) were utilized to assess self-care practices and treatment satisfaction, respectively. The SC-CII consists of self-care maintenance, self-care monitoring, self-care management, and self-care confidence domains. The TSQM includes effectiveness, side effects, convenience, and the global satisfaction scale. Data were analyzed using the Statistical Package for the Social Sciences software. **Results:** Pharmacist-provided patient education significantly improved self-care maintenance and self-care confidence domains, whereas no significant changes were observed in the self-care monitoring and self-care management domains within the intervention group. The control group experienced deterioration in all SC-CII domains after two months. There was a significant improvement across all TSQM scales in the intervention group, whereas no change was observed in the effectiveness, convenience, and global satisfaction scales, with deterioration in the side effect scale within the control group. **Conclusion:** Pharmacist-provided patient education significantly improved self-care maintenance and self-care confidence domains of the SC-CII and enhanced treatment satisfaction among UC patients. No statistically significant changes were observed in self-care monitoring and self-care management domains after two months.

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1. Introduction

Ulcerative colitis (UC) is an inflammatory bowel disease (IBD) characterized by chronic inflammation and ulceration predominantly involving the colon and rectum (1). It is a

chronic, incurable disease that needs lifelong medication treatment and is associated with an increased risk of colorectal cancer (2). While UC can develop at any age, it most commonly occurs between the ages of 15 and 30, with a second smaller peak after the age of 60 years (3). Common symptoms of UC include bloody diarrhea, abdominal discomfort, urgency, and tenesmus. The medical path is marked by periods of exacerbations and remissions, which may occur spontaneously or in response to therapeutic changes or during the progression of another disease (4).

The goals of UC management are to induce and maintain the remission of the disease (5). Effective management involves drug therapy, lifestyle adjustment, and surgical

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intervention (6). Recently, increasing attention has been given to the role of lifestyle adjustment (like physical activity, adequate hydration, and sufficient sleep) in affecting the onset or progression of UC, although findings differ between studies and populations (7,8). Conventional management includes aminosalicylates, steroids, and immune modulators, while biologic therapy has become an important treatment option (9).

Biologic agents such as anti-tumor necrosis factor- α antibodies (infliximab, adalimumab, and golimumab) and anti-interleukin-12/23 p40 antibodies (ustekinumab) have significantly improved the management of UC and contributed to better patient outcomes (9,10). Patients with moderate to severe UC are the main candidates for biologic treatment, which is usually given in two phases: The induction phase to induce a therapeutic response and the maintenance phase to maintain the response and avoid relapse (11). Although biologic therapies have significantly improved the treatment of UC, their use is associated with numerous challenges, including their high economic burden, immunosuppressive effects, increased risk of infections, infusion reactions, loss of response over time, and the requirement for continuous monitoring to ensure medication safety (9, 11, 12). Therefore, patient education is essential to enhance treatment adherence, facilitate the early identification of adverse effects, and optimize treatment outcomes (13).

Self-care is generally recognized as an essential element of effective disease management and health maintenance (14). Self-care "is defined as the process of maintaining health through health-promoting practices and managing illness" (15). Self-care for patients with UC focuses on behaviors that can prevent relapses, alleviate symptoms, and improve daily living. Patients engage in activities such as taking medication as prescribed, restricting their diet, and modifying behaviors that could trigger symptoms. (16).

As with other chronic illnesses, patients' satisfaction may influence the long-term treatment of UC (17). Medication satisfaction is a subjective patient-reported outcome that assesses patients' perceptions of the medication-taking procedure and its associated outcomes (18). In comparison with patients who are dissatisfied with prescribed medication, satisfied patients tend to demonstrate better medication adherence, engage more actively in self-care behaviors, and experience improved quality of life outcomes (19).

While many studies have been carried out in Iraq to assess the outcomes of the educational intervention carried out by pharmacists in the management of various chronic diseases other than UC, which have demonstrated a beneficial role of pharmacist interventions (20-29). To the best of our knowledge, no previous study has specifically assessed the effect of pharmacist-provided patient education on self-care practices and treatment satisfaction among Iraqi patients diagnosed with UC who are receiving biologic therapy. Therefore, this study was designed to examine the impact of pharmacist-provided patient education on self-care practices and treatment satisfaction among Iraqi patients with UC receiving biologic therapy.

2. Methods

2.1. Study design and setting

The design of this study was a quasi-experimental, controlled study conducted among Iraqi patients diagnosed with UC who were receiving biologic therapy at the

Gastroenterology and Hepatology Teaching Hospital in Medical City Complex in Baghdad, Iraq, between December 2025 and March 2026.

2.1.1. Inclusion criteria

- 1) Patients 18 years and older.
- 2) Patients diagnosed with UC by a gastroenterology specialist.
- 3) Current use of biologic therapy as part of the maintenance phase, with at least 4 months of treatment before enrollment in the study to ensure completion of the induction phase.
- 4) Patients must agree to enroll in the study.

2.1.2. Exclusion criteria

- 1) Pregnant women (because hormonal changes that occur during pregnancy may interfere with interpretation of results).
- 2) Patients with hearing, speech, or cognitive dysfunction (because such conditions could impair their ability to understand the questions and educational intervention).
- 3) Patients providing incomplete information while filling out the questionnaire.
- 4) Patients with other illnesses, including malignancy, chronic kidney or liver disease, or other autoimmune diseases (because these illnesses could confound the study).

2.2. Study participants

The study recruited a convenience sample of patients with a confirmed diagnosis of UC who were receiving biologic treatment. The total number of patients screened for eligibility was 140. Thirty-two patients did not meet the inclusion criteria and were excluded from the study. The remaining 108 patients who met the inclusion criteria included 55 patients in the intervention group and 53 patients in the control group. After two months, the number of patients who completed the study was 95 (48 patients in the intervention group and 47 patients in the control group). Thirteen patients were excluded from the study; 12 patients due to a shortage of biological drugs at the hospital and 1 patient because of incomplete filling of the questionnaire during the baseline assessment (Figure 1). Participants were recruited sequentially; participants in the control group enrolled before those in the intervention group. This approach was used to minimize the risk of contamination and reduce the sharing of educational information from the intervention group patients to the control group patients.

2.3. Study groups

Group one: The active (interventional) group included patients who received educational materials (face-to-face counseling and a booklet) prepared and introduced by the researcher (pharmacist).

Group two: The control group included patients who received routine conventional care, including scheduled biologic therapy, routine follow-up visits, and laboratory investigations as needed.

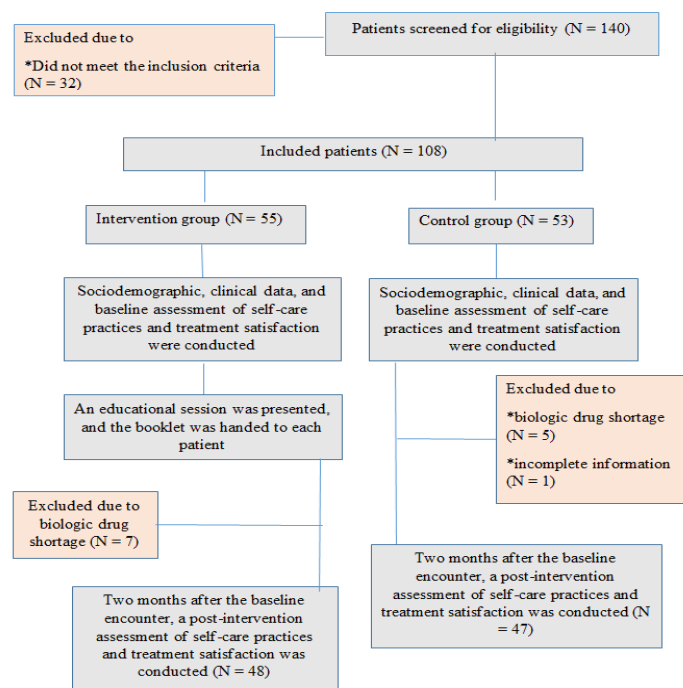


Figure 1. The study flowchart.(N, Number of patients)

2.4. Study tools

2.4.1. The Arabic version of the self-care of chronic illness inventory version 3.1 (SC-CII).

The Arabic version of the SC-CII was obtained from the Self-Care Measure repository after permission was obtained from the instrument developers. The instrument has been previously translated and psychometrically validated in Arabic population (30). It was used to assess self-care practice; a 30-question questionnaire consists of four domains: Self-Care Maintenance (questions 1 through 8), Self-Care Monitoring (questions 9 through 13), Self-Care Management (questions 15 through 20), and the Self-Care Confidence domain (questions 21 through 30) (31); symptom recognition (measured by question 14) mediated the relationship between Self-Care Monitoring and Self-Care Management. Each question is rated on a 5-point Likert scale ranging from 1 ("never") to 5 ("always"), with standardized scores from 0 to 100. Higher scores indicate greater engagement in self-care behaviors (31). Because the self-care management domain evaluates responses to symptoms, it is applicable only when patients experience symptoms. As recommended by Riegel and Colleagues for question 14, a 5-point ordinal response scale (from 1 "not quickly" to 5 "very quickly") was used to form an observed variable (32, 33). Every domain of the SC-CII is scored separately and ranges from 0 to 100 (32). A cut-point of 70 or greater on each domain is considered indicative of self-care adequacy (14). A score between 0 and 100 represents the percent of the total possible score achieved. A higher score indicates better self-care (31).

2.4.2. The Arabic version of the treatment satisfaction questionnaire for medication (TSQM version 1.4) (34-36).

The TSQM version 1.4 is a verified, psychometrically sound instrument and consists of 14 questions. There are four scales in this instrument: [the effectiveness scale (questions 1-3), the side effects scale (questions 4-8), the convenience scale (questions 9-11), and the global satisfaction scale (questions 12-14)]. Responses were measured using a 5- or 7-point Likert-type scale, except for question 4 in the side effects scale, which asked if patients suffered from any side effects. If the patient does not experience any side effects, the side effect scale (questions 5-8) is not answered; the overall score for this scale will automatically be calculated as a maximum of 100. The score for each scale is calculated by subtracting the number of questions in that scale from the sum of the question scores in that scale, dividing by the difference between the maximum and minimum possible score of that scale, and multiplying by 100 (34).

2.5. Data collection and study process

Data regarding patients' sociographic and baseline clinical characteristics were collected from patients using a data collection sheet after obtaining their verbal consent. This study consisted of two visits: baseline assessment and follow-up visits. Initially, patients' verbal consent was obtained, and sociodemographic and baseline clinical data were collected. Thereafter, Arabic versions of the SC-CII and TSQM-14 questions were utilized to measure the baseline level of self-care practices and treatment satisfaction, respectively, for each patient in the study groups (intervention and control). These questionnaires were filled out independently by the patients without any influence from the researcher.

Following this, each patient in the active (intervention) group was provided with an individual; the face-to-face educational sessions lasted approximately 20-25 minutes and involved the following: 1- Explanation about the UC, etiology, and its symptoms. 2-Explanation about the biologic therapy (importance of these drugs, administration methods, side effects, and the approaches to prevent or mitigate them). 3-Dietary advice about healthy habits, including eating smaller, frequent meals and remaining adequately hydrated. 4-Foods that may worsen symptoms (such as high-fat foods, spicy foods, and alcohol).

Subsequently, an Arabic booklet was provided to the patients as written educational content. The booklet included information about UC and its manifestations, biologic therapy (mechanism of action, adverse effects, and methods used to avoid or manage these adverse effects), the importance of medication adherence, flare-up recognition and management, dietary advice, lifestyle changes, stress management, and the importance of follow-up. The content of the educational booklet was reviewed by five academic staff members holding PhD degrees from the Department of Clinical Pharmacy, College of Pharmacy, University of Baghdad, in addition to a gastroenterologist from Baghdad's Gastroenterology and Hepatology Teaching Hospital. It was also pre-tested with 10 UC patients who were not included in the study to assess its clarity and comprehensibility.

The patients were able to contact the pharmacist (researcher) via mobile phone throughout the study course whenever needed. Two months later, the same parameters were reassessed for all patients in the study groups (active

and control groups) to evaluate how pharmacist-provided patient education affects the self-care practices and treatment satisfaction.

2.6. Statistical Analysis

The Excel sheet was utilized to store the collected data and then transmitted to the Statistical Package for the Social Sciences software SPSS (version 26.0). A Shapiro-Wilk test was employed to determine the normality of parameters. Parameters with a Shapiro-Wilk test p-value > 0.05 were considered normally distributed, while the parameters with a p-value ≤ 0.05 were considered not normally distributed. An independent t-test was used to compare the differences between the study groups (active and control groups), ((the Mann-Whitney U test was employed for not normally distributed data)). Within each group, the changes between before and after the patient education were examined by using a paired t-test (if normally distributed) or a Wilcoxon signed-rank test (if not normally distributed). The P-value of less than 0.05 was used as a significant indication. The False Discovery Rate (FDR) method was used to adjust p-values for multiple comparison. Effect size was assessed using Cohen's d for parametric tests and Rosenthal's r for non-parametric tests. Cohen's d values were interpreted as small: (0.20-0.49), moderate: (0.50-0.79), large: > 0.80. Rosenthal's r values were interpreted as small: (0.10-0.29), moderate: (0.30-0.49), large: > 0.50.

3. Results

The total number of patients included in this study was 95, forty-eight in the intervention group and forty-seven in the control group. The mean age of patients was 33.75 ± 10.20 years in the intervention group and 36.63 ± 11.89 years in the control group. In both groups, the majority of participants were female (58.3% in the intervention group and 51.1% in the control group). The median UC durations were six years in the intervention group and seven years in the control group. Infliximab was the most frequently used biologic agent (93.8% in the intervention group and 91.5% in the control group). Comorbidities mainly included hypertension and asthma. At baseline, no statistically

significant differences between the two groups were observed, as illustrated in **Table 1**.

Regarding self-care practices, at baseline, there were no statistically significant differences in self-care maintenance, self-care monitoring, self-care management, and self-care confidence domains between the intervention and control groups, indicating comparability between the two groups before the pharmacist-provided patient education. This comparability was supported by the negligible to small effect sizes.

After two months, a statistically significant improvement was seen within the intervention group in the self-care maintenance and self-care confidence domains, these improvements were accompanied with large and moderate effect sizes, reflecting the magnitude of the intervention effect. No significant change in the self-care monitoring and self-care management domains which were associated with small effect sizes. While, within the control group, a significant deterioration was seen in all domains.

After two months, a statistically significant difference between the two groups was observed in the self-care maintenance, self-care management, and self-care confidence domains, while there was no statistically significant difference in the self-care monitoring domain. The comparison of change scores between the two groups revealed statistically significant improvements in all domains of the SC-CII. The corresponding effect sizes showed a small intervention effect for the monitoring domain, a moderate effect for the maintenance domain, and a large effect for the management and confidence domains. As seen in **Table 2**.

As illustrated in **Table 3**, at baseline, no statistically significant difference was found in symptom recognition ability when comparing the intervention and control groups, indicating comparability between the two groups before the pharmacist provided patient education. After two months, a statistically significant difference was detected within the intervention group, with no significant change in the control group. A statistically significant difference was observed between the two groups after pharmacist intervention.

Table 1. Sociodemographic and baseline clinical characteristics of patients

Parameters	Active group	Control group	P value
Number of patients	48	47	-
Age (year), mean ± SD	33.75 ± 10.20	36.63 ± 11.89	0.207 #
Sex, N (%)			0.47 ‡
Female	28 (58.3%)	24 (51.1%)	
Male	20 (41.7%)	23 (48.9%)	
Marital Status, N (%)			0.947 ‡
Single	14 (29.2%)	14 (29.8%)	
Married	34 (70.8%)	33 (70.2%)	
Residence, N (%)			0.74 &
Urban	44 (91.7%)	42 (89.4%)	
Rural	4 (8.3%)	5 (10.6%)	
Disease Duration (years), median (IQR)	6 (3 - 9.75)	7 (4 - 12)	0.296 *
Biologic therapy type, N (%)			0.837 &
Infliximab	45 (93.8%)	43 (91.5%)	
Adalimumab	2 (4.2%)	3 (6.4%)	
Ustekinumab	1 (2%)	1 (2.1%)	
Comorbidities			
Absence of comorbidities	44 (91.7%)	44 (93.6%)	1.000 &
Presence of comorbidities	4 (8.3%)	3 (6.4%)	

Independent t-test, ‡ chi-square test, & Fisher-Freeman-Halton exact test, * Mann-Whitney U test, IQR: Interquartile range, N: Number, SD: Standard Deviation. The reported comorbidities included hypertension and asthma.

Table 2. Differences between the study groups according to the Self-Care of Chronic Illness Inventory

Parameters	Active group	Control group	P-value	Adj. P-value	Effect size
Self-care maintenance, median (IQR)					
Baseline	59 (50-68.25)	63 (50-81)	0.102*		0.168 ^b
After patient education	66 (56-78)	59 (38-72)	0.001 [‡]	0.002	0.7 ^a
P value	< 0.001 [#]	0.003 [%]			
Adj. P value	0.002	0.005			
Effect size	0.514 ^b	0.455 ^a			
Change	6 (0-19)	-4 (-25-3)	< 0.001*	0.002	0.442 ^b
Self-care monitoring, median (IQR)					
Baseline	82.5 (66-95)	85 (75-95)	0.349*		0.096 ^b
After patient education	85 (66-95)	75 (60-90)	0.065*	0.077	0.189 ^b
P value	0.324 [#]	0.032 [%]			
Adj. P value	0.324	0.04			
Effect size	0.142 ^b	0.313 ^a			
Change	5 (-8.75-10)	-10 (-25-5)	0.01*	0.015	0.265 ^b
Self-care management, mean ± SD					
Baseline	61.36 ± 22.21	65.92 ± 20.56	0.463 [‡]		0.21 ^a
After patient education	72.71 ± 16.54	51.86 ± 25.75	0.023 [‡]	0.031	0.89 ^a
P value	0.087 [%]	0.002 [%]			
Adj. P value	0.097	0.004			
Effect size	0.36 ^a	0.46 ^a			
Change	8.33 ± 22.87	-11.71 ± 25.26	0.003 [‡]	0.005	0.824 ^a
Self-care confidence, median (IQR)					
Baseline	73 (61-83.75)	78 (63-93)	0.16*		0.144 ^b
After patient education	78 (70.75-85)	63 (43-75)	< 0.001*	0.002	0.458 ^b
P value	0.02 [#]	< 0.001 [#]			
Adj. P value	0.029	0.002			
Effect size	0.336 ^b	0.666 ^b			
Change	3 (-4.5-12.75)	-12 (-35-0)	<0.001*	0.002	0.515 ^b

‡ Independent T-test, * Mann-Whitney U test, & Paired T-test, # Wilcoxon signed-rank test, IQR: Interquartile range, SD: Standard Deviation, Adj. P value: Adjusted p-value using The False Discovery Rate method. Change = post-intervention score – pre-intervention score. Effect size: a Cohen's d was used for parametric tests, b Rosenthal's r was used for non-parametric tests.

Table 3. Differences between the study groups according to symptom recognition (Question 14)

parameters	Active group	Control group	P value	Adj. P value
Symptom recognition (Q 14)				
Baseline			0.125 [‡]	
Recognized symptoms as related to their health condition	44 (91.7%)	38 (80.9%)		
No symptoms experienced	4 (8.3%)	9 (19.1%)		
After patient education			0.001 [‡]	0.0023
Recognized symptoms as related to their health condition	24 (50%)	43 (91.55)		
No symptoms experienced	24 (50%)	4 (8.5%)		
P value	0.001 ^a	0.227 ^a		
Adj. P value	0.0023	0.238		

Symptom recognition ability is expressed as frequencies and percentages, [‡] chi-square test, a McNemar Test, Adj. P value: Adjusted p-value using The False Discovery Rate method.

Regarding treatment satisfaction, as seen in **Table 4**, at baseline, there were no statistically significant differences in effectiveness, side effect, convenience, and global satisfaction scales between the two study groups (intervention and control), indicating comparability between the two groups before the pharmacist intervention. This comparability was supported by the negligible to small effect sizes. After two months, a significant improvement was seen within the intervention group in all scales of the TSQM, whereas no significant differences were identified

within the control group in all scales of the TSQM, except the side effect scale ($p < 0.001$), where a significant deterioration in the scores was noted.

After two months, a statistically significant difference between the two study groups was observed in all four scales of TSQM. The comparison of change scores between the two groups revealed statistically significant improvements in all scales of the TSQM. The corresponding effect sizes showed a moderate intervention effects across all scales as illustrated in **Table 4**.

Table 4. Differences between the study groups according to treatment satisfaction for medication scores

Parameters	Active group	Control group	P value	Adj. P value	Effect size
Effectiveness scale, median (IQR)					
Baseline	78 (67-89)	72 (61-89)	0.642*		0.05 ^b
After patient education	83 (78-94)	67 (56-83)	< 0.001*	0.0017	0.47 ^b
P value	< 0.001*	0.64 *			
Adj. P value	0.0017	0.64			
Effect size	0.55 ^b	0.5 ^a			
Change	11 (0-20.75)	-5 (-17-11)	< 0.001*	0.0017	0.4 ^b
Side-effect scale, median (IQR)					
Baseline	94 (45.5-100)	100 (56-100)	0.321*		0.10 ^b
After patient education	100 (63-100)	56 (31-88)	< 0.001*	0.0017	0.48 ^b
P value	0.006*	< 0.001*			
Adj. P value	0.0087	0.0017			
Effect size	0.40 ^b	0.51 ^b			
Change	0 (0-41.5)	-12 (-44-0)	< 0.001*	0.0017	0.43 ^b
Convenience scale, median (IQR)					
Baseline	61 (50-72)	67 (56-72)	0.23*		0.25 ^b
After patient education	67 (56-78)	61 (50-72)	0.043*	0.052	0.21 ^b
P value	0.007 *	0.209 #			
Adj. P value	0.009	0.238			
Effect size	0.41 ^a	0.18 ^b			
Change, mean $\pm$ SD	7.39 $\pm$ 18.02	-6.23 $\pm$ 27.12	0.005 ‡	0.008	0.64 ^a
Global scale, median (IQR)					
Baseline	67.5(51.75-86)	64 (57-79)	0.733*		0.035 ^b
After patient education	86 (73-93)	64 (50-79)	< 0.001*	0.0017	0.46 ^b
P value	< 0.001*	0.32 #			
Adj. P value	0.0017	0.341			
Effect size	0.64 ^b	0.14 ^b			
Change	15(0-26.5)	0 (-22-8)	< 0.001*	0.0017	0.4 ^b

‡ Independent T-test, * Mann-Whitney U test, & Paired T-test, # Wilcoxon signed-rank test. IQR: Interquartile range, SD: Standard Deviation, Adj. P value: Adjusted p-value using The False Discovery Rate method. Change = post intervention score – pre intervention score. Effect size: a Cohen's d was used for parametric tests, b Rosenthal's r was used for non-parametric tests

4. Discussion

Due to the chronic and relapsing character of UC, long-term adherence to medication and the influence of diet and psychological stress on disease activity remain major challenges, affected by complex therapeutic regimens and limited patient knowledge (37). The pharmacist-provided patient education used in this study targeted these challenges by enhancing patients' understanding of UC and its treatment, improving self-efficacy, enhancing self-care behaviors, and providing dietary advice aimed at maintaining remission and preventing relapse. Various studies have reported that patients with IBD have substantial informational needs about their disease, particularly regarding symptoms, the etiology of the disease, dietary management, and prognosis (37, 39, 40). Evidence from a previous Iraqi study indicates that self-care practices among patients with UC remain suboptimal, reflecting insufficient knowledge and self-management skills. The authors recommended the importance of the introduction of structured educational intervention with a booklet to enhance understanding and promote effective self-care habits among patients (16).

The positive effects of patient education and the educational booklet observed in this study are consistent with previous studies demonstrating the important role of

patient education in the treatment of UC and the improvement of patient-reported outcomes. For example, a randomized clinical study demonstrated that the pharmacist-led educational intervention in UC patients was associated with a significant reduction in non-adherence rates and an improvement in patient-reported outcomes compared with conventional care (41). Similarly, a study found that a multifaceted intervention in IBD patients significantly improved adherence with prescribed therapy. The intervention group maintained higher adherence over time and showed better medication satisfaction compared with the control group (42).

Another study demonstrated the beneficial effect of an educational booklet on medication adherence and clinical outcomes among patients with UC (43). Likewise, a study demonstrated the effectiveness of an educational program in enhancing medication and dietary compliance and highlighted the important role of patient education in improving disease treatment and minimizing complications among Iraqi patients with UC (44). Collectively, these findings reinforce the beneficial effect of the pharmacist-provided patient education observed in this study.

Regarding self-care practices, this study demonstrated a significant improvement in self-care maintenance and self-care confidence domains, as well as symptom recognition, with no significant change in the self-care monitoring and self-care management domains compared with baseline in

the intervention group. The SC-CII scores were interpreted according to the proposed cut-off value of 70 for adequate self-care. Self-care monitoring and self-care confidence scores were above this threshold at baseline and self-care management exceeded this cut-off after the pharmacist-led intervention, whereas self-care maintenance remained below the recommended level despite the observed improvement. In the control group, a significant deterioration was noted in all domains of the SC-CII with no change in symptom recognition.

After the educational intervention, the significant reduction in the proportion of patients reporting symptoms suggests that fewer patients experienced symptoms at follow-up. Since the symptom recognition item serves as the entry question for the self-care management section of the SC-CII, this result likely reflects a lower symptom burden rather than an isolated improvement in patients' ability to recognize symptom.

The improvement in some domains of self-care practices in the intervention group may be attributed to the beneficial effects of the pharmacist-led intervention on patients' understanding and knowledge. According to the updated Middle-Range Theory of Self-Care of Chronic Illness, patients' understanding and knowledge are acquired through education, and health literacy plays an important role in self-care. Adequate health literacy enables patients to understand their condition, recognize symptoms, integrate self-care seamlessly into their daily lives, and make appropriate decisions about treatment and lifestyle, while limited understanding may impair self-care behaviors (45). Therefore, the observed improvement in self-care maintenance, self-care confidence, and symptom recognition may be attributed to the improvement in patients' understanding and knowledge through pharmacist-led counselling and the educational booklet.

This finding is in line with an earlier study showing that patient education significantly improved patients' understanding and lifestyle behaviors among patients with UC, highlighting the importance of educational intervention in promoting illness self-management and healthy behaviors (37). Similarly, a previous study indicated that integrating educational and psychological support may improve self-care behaviors and clinical outcomes among patients with IBD (13).

The lack of change in the self-care monitoring domain in the intervention group may be related to the nature of this section. The updated Middle-Range Theory of Self-Care of Chronic Illness defines self-care monitoring as "a process of routine vigilant surveillance, self-awareness, and body monitoring." "The early recognition of changes in signs and symptoms so that the appropriate action can be taken before the condition worsens is the primary goal of self-care monitoring" (45). The educational intervention may improve patients' knowledge and understanding, but the educational intervention alone may not be enough to improve self-care monitoring skills. The lack of change in the self-care management domain in the intervention group may be due to the complexity of self-management in patients with IBD. A previous study demonstrated that IBD self-management requires complex behavioral modifications, including developing skills in identifying and managing symptoms, controlling nutrition and therapy, dealing with the unpredictable character of the disease, and keeping motivation (46). The intervention alone may not be sufficient to improve self-care management behaviors.

In the control group, the deterioration observed across all domains of the SC-CII was an unexpected finding, and the exact cause cannot be determined from the current study.

Previous studies suggested that self-care in patients with IBD is a complex and multidimensional process influenced by numerous factors, including cognitive resources, relational context, clinical burden, and psychological factors (47, 48). The unpredictable nature of UC, the complexity of self-care behaviors, the absence of educational support, and a possible reduction in patient motivation may have contributed to the observed deterioration. Assessment reactivity may have also contributed to this finding and represent a potential limitation, as completing the baseline questionnaire may have increased patients' awareness of their self-care deficiencies without providing specific educational support to address them.

Regarding treatment satisfaction, this study revealed that the pharmacist-provided patient education significantly improved all scales of TSQM in the active group compared with baseline. In contrast, the control group showed no significant change in the effectiveness, convenience, and global scales, with a significant deterioration in the side effect scale.

This improvement in the active group may be attributed to increased patient understanding and continuous reinforcement of proper medication use, which enhanced patient confidence in therapy and their perception of the treatment. The deterioration in the side-effect scale in the control group may be explained by insufficient information and lack of follow-up; this may have enhanced patient sensitivity to minor symptoms and led to negative perceptions of treatment effects.

The improvement in treatment satisfaction is consistent with findings from randomized controlled trials, which showed that clinical pharmacist counseling significantly improved patient-reported outcomes and treatment satisfaction compared with standard care among patients with IBD receiving anti-tumor necrosis factor- α therapy (13).

5. Conclusion

This study concluded that the pharmacist-provided patient education significantly improved self-care maintenance and self-care confidence, while no statistically significant changes were observed in self-care monitoring and self-care management over the two-month follow-up period. In addition, pharmacist-provided patient education significantly enhanced treatment satisfaction among Iraqi patients with UC receiving biologic therapy. The pharmacist-provided patient education enhanced patients' engagement in their care and improved their perceptions of treatment. These findings highlight the important role of pharmacists in improving patient-reported outcomes among patients with UC.

6. Limitation

The limitations of this study include the small sample size, a single-center design, the use of convenience sampling, the lack of randomization, and the short follow-up duration, which may make the evaluation of the long-term sustainability of the observed results challenging. In addition, the use of self-reported questionnaires may have introduced response bias. The sequential enrollment of participants, with the control group recruited before the intervention group, may have introduced potential differences over time that could confound the study findings.

7. Recommendations

Integrating pharmacists into the multidisciplinary healthcare team responsible for managing patients diagnosed with UC. Providing the educational booklet to all UC patients to enhance medication compliance and self-care management. Allocating more time and greater effort for educating UC patients about the disease, symptoms, and treatment. Conducting further prospective studies in Iraq to incorporate a larger sample size from different regions.

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Ethical approvals: The Research Ethics Committee of the College of Pharmacy, University of Baghdad (RECAUBCP0625H in 30/11/2025), and the Directorate of Medical City (40464 in 4/12/2025) and the Directorate of Medical City have given their approval. An official correspondence from the College of Pharmacy was addressed to the Gastroenterology and Hepatology Teaching Hospital in the Medical City Complex in Baghdad/Iraq. Verbal informed consent was obtained from all participants before enrollment in the study after the study objectives and procedures had been explained. Participants were informed of their right to withdraw from the study at any time without any effect on their medical treatment and healthcare services.

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أثر التنقيف الصحي الذي يقدمه الصيدلي على ممارسات الرعاية الذاتية والرضا عن العلاج البيولوجي لدى مرضى التهاب القولون التقرحي

الخلاصة

المقدمة: يلعب الصيدلاني دورًا هامًا في إدارة التهاب القولون التقرحي. قد يُحسن التنقيف الصحي الذي يقدمه الصيدلي ممارسات الرعاية الذاتية والرضا عن العلاج لدى المرضى الذين يتناولون أدوية مزمنة لعلاج التهاب القولون التقرحي. **الهدف:** تقييم أثر التنقيف الصحي الذي يقدمه الصيدلي على ممارسات الرعاية الذاتية والرضا عن العلاج لدى مرضى التهاب القولون التقرحي. **طرق العمل:** أجريت دراسة شبه تجريبية مضبوطة على مرضى التهاب القولون التقرحي الذين يراجعون مستشفى أمراض الجهاز الهضمي والكبد التعليمي في مجمع المدينة الطبية/بغداد. شملت الدراسة 95 مريضًا: 48 في مجموعة التدخل الذين تلقوا التنقيف الصحي من الصيدلي، و47 في المجموعة الضابطة الذين تلقوا الرعاية القياسية. تم تقييم المرضى عند خط الأساس وبعد شهرين. استُخدمت النسخ العربية من استبيان الرعاية الذاتية للأمراض المزمنة (SC-CII) واستبيان الرضا عن العلاج الدوائي (TSQM) لتقييم ممارسات الرعاية الذاتية والرضا عن العلاج، على التوالي. يتكون استبيان SC-CII من مجالات الحفاظ على الرعاية الذاتية، ومراقبة الرعاية الذاتية، وإدارة الرعاية الذاتية، والثقة في الرعاية الذاتية. أما استبيان TSQM فيشمل الفعالية، والآثار الجانبية، وسهولة الاستخدام، ومقاييس الرضا العام. تم تحليل البيانات باستخدام برنامج الحزمة الإحصائية للعلوم الاجتماعية (SPSS). **النتائج:** أدى التنقيف الصحي الذي قدمه الصيدلي للمرضى إلى تحسن ملحوظ في مجالي الحفاظ على الرعاية الذاتية والثقة في الرعاية الذاتية، بينما لم تُلاحظ أي تغييرات ملحوظة في مجالي مراقبة الرعاية الذاتية وإدارة الرعاية الذاتية ضمن المجموعة التجريبية. شهدت المجموعة الضابطة تدهورًا في جميع مجالات استبيان SC-CII بعد شهرين. لوحظ تحسن ملحوظ في جميع مقاييس استبيان TSQM في المجموعة التجريبية، بينما لم يُلاحظ أي تغيير في مقاييس الفعالية وسهولة الاستخدام والرضا العام، مع تدهور في مقياس الآثار الجانبية ضمن المجموعة الضابطة. **الاستنتاج:** أدى التنقيف الصحي الذي يقدمه الصيدلي للمرضى إلى تحسن ملحوظ في مجالي الحفاظ على الرعاية الذاتية والثقة بالنفس في الرعاية الذاتية وفقًا لمقياس SC-CII، كما عزز الرضا عن العلاج لدى مرضى التهاب القولون التقرحي. لم تُلاحظ أي تغييرات ذات دلالة إحصائية في مجالي مراقبة الرعاية الذاتية وإدارتها بعد شهرين.

الكلمات المفتاحية: كتيب تنقيفي، تنقيف المرضى، ممارسات الرعاية الذاتية، الرضا عن العلاج، التهاب القولون التقرحي.