
- **Basic Research**

Effect of Life Style Modification on the health status for Patients with Ulcerative Colitis

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Abstract

Ulcerative colitis is a chronic inflammatory disease affecting the colon, and its incidence is rising worldwide. The pathogenesis is multifactorial, involving genetic predisposition, epithelial barrier defects, and environmental factors. **Aim:** The aim was to evaluate the effect of Life style Modification on Patients with Ulcerative Colitis.. **Setting sample:** A purposive sample, A quasi-experimental (pretest posttest) research design was adopted for the current study. Fifty-seven patients with ulcerative colitis were enrolled in this study in gastrointestinal out-patient clinic at Kafre El sheik University Hospital. **Tools:** Structured patient interview questionnaire and Healthy lifestyle questionnaire tools were used to collect the data. **Results:** The study results revealed that (56.1 %) of the study participant were male whereas (43.8%) were female. The results revealed that total knowledge scores of patients' post-interventions were improved than that of their pre-scores, in addition to increase the total score of healthy lifestyle adherence after the study interventions and follow-up compared to pre intervention with highly statistically significant differences between them at $p < 0.001$. **Conclusion:** Lifestyle modifications can be effective in improving selected outcomes for patients with ulcerative colitis. **Recommendations:** Replication of the study on larger probability sample selected from different geographical areas in Egypt is recommended to more generalizable data.

Keywords:

ulcerative colitis patient & Lifestyle modifications.

Introduction/ Background

Ulcerative colitis is a chronic form of gastrointestinal inflammation. Seventy percent of patients with ulcerative colitis believe that temporary psychosocial stress may have caused a flare, or at least influenced, the course of their disease. It occurs across all ages, but it is prevalent in younger individuals, from their teens their thirties. the impact of colitis on people deserves attention since it results in grievous complications (Jong et al., 2020).

The incidence and prevalence of ulcerative colitis are increasing worldwide. The prevalence is estimated to be 70–500 cases per 100.000 with the peak age of onset between 15 years and 25 years. In 15% of cases, it occurs at different frequencies around the world. The United States of America was reported to have the highest incidence of UC. It has always seemed to be rare in the Middle East and Northern Africa. In Egypt, the incidence has been exaggerated within the past 10 years (Kamal, et al. 2015).

Ulcerative colitis is an auto-immune disorder of the colon that mainly impacts the rectum and may reach other parts of the colon. It is characterized by relapsing and remitting mucosal inflammation, beginning in the rectum and extending to the proximal parts of the colon. It is a life-long disorder of unknown etiology (*Maged et al., 2020*). Seventy percent of patients with ulcerative colitis believe that temporary psychosocial stress may have caused a flare, or at least influenced the course of their un wellness in the past (Kucharzik et al., 2018)

The symptoms of ulcerative colitis vary according to the extent and intensity of the inflammatory process. These symptoms include increased frequency of bowel movements, abdominal pain, diarrhea with blood and mucus, weight loss and anemia, which can affect patients' quality of life. The disease has an intermittent pattern with periods of remission. The annual incidence of ulcerative colitis varies geographically and increases over time. Most patients with this condition suffer from mild to moderate manifestations involving the left side of the colon (Lise, et al., 2020).

The first goal of management is to identify and prevent complications and prevent decrease recurrence. Lifestyle modification is the first line of intervention for all patients to enhance their health outcomes and prevent the recurrence of complications (Abdelwahab et al., 2021). Lifestyle, as used in this context, refers to the patient's way of living, which includes behaviors that either promote or impair good health and longevity such as the consumption of food with high sugar and fat content, exercise, drug use, smoking, and stress, which all have an influence on ulcerative colitis. So, lifestyle modification is important for improving patients' physical and psychological well-being, in addition to stabilizing the course of the disease. Therefore, patients with ulcerative colitis should be informed about the different lifestyle practices (Langhorst et al., 2020).

Nurses can have a leading role in helping patients with ulcerative colitis. Nurses can design and implement an educational program for these patients, with the aim of helping them to lead normal lives and avoid complications. Patients in the community setting or those

recently diagnosed may primarily require education about diet and medications and referral to support groups. The community health nurse can help the patients with ulcerative colitis to manage their disease at home, with regular follow-up. Patients need simple, complete, and clear information about the disease and its management, and the required self-care skills they need to acquire to care for themselves (Mohamed, et al., 2017).

Significance of the study:

Worldwide, the highest incidence and prevalence of ulcerative colitis are seen in Northern Europe. Ulcerative colitis has an incidence of 9–20 cases per 100,000 persons per year. Its prevalence is 156–291 cases per 100,000 persons per year. In Western countries, the incidence and prevalence of ulcerative colitis have increased in the past 50 years, up to 8–14/100,000 and 120–200/100,000 persons (Lynch & Hsu, 2021).

In Egypt, the prevalence of ulcerative colitis has increased in the past years. It was the 4th most frequently encountered pathologic diagnosis after internal hemorrhoids and non-specific colitis, constituting about 11.5%. Since it ranges from 2 to 15 per 100,000 for ulcerative colitis, the economic cost to patients and society is high, and patients' quality of life is significantly impaired (Mostafa et al., 2018).

Objective

The aim was to evaluate the effect of Life style Modification on the health status for Patients with Ulcerative Colitis.

Methods

Research design

A quasi-experimental (pretest posttest) research design was adopted for the current study.

Research hypotheses

To fulfill the aim of the current study, the following hypotheses were formulated: Hypothesis 1: patients who will receive instructional guidelines as regards ulcerative colitis will have better knowledge level compared with their knowledge before receiving the instructional guidelines.

Hypothesis 2: patients who will practice lifestyle modifications will have less pain level compared with their pain level before practicing lifestyle modifications as measured by visual analog pain scale.

Setting

The present study was conducted at the Gastrointestinal Out-patient clinic affiliated to Kafre El sheikh University Hospital; this setting was selected due to the high attendance

of patients with ulcerative colitis and also it serves the biggest region (including both rural and urban areas) .

Samples:

A purposive sample of patients visited the outpatient clinic from 9:00 AM through 12:00 AM on Saturday, from which outpatients with a specific disease (ulcerative colitis) in the chosen hospital who met the inclusion criteria were selected. Data were collected from July 2020 until the end of December 2020.

Inclusion Criteria

- Both adult males and females who had never received guidelines about the disease.
- Patients free from other chronic illnesses.

Exclusion criteria

The patients with acute rectum bleeding, previous colon operation.

Sample size

Based on data from the literature (Mohamed et al., 2007), considering the 5% level of significance and 80% power of the study, the sample size can be calculated using the following formula: $n = [(Z\alpha/2 + Z\beta)^2 \times \{2(SD)^2\}] / (\text{mean difference between the two groups})^2$ where SD = standard deviation $Z\alpha/2$: This depends on the level of significance; for 5%, this is 1.96. $Z\beta$: This depends on the power of the study; for 80%, it is 0.84 Therefore, $n = [(1.96 + 0.84)^2 \times \{2(16.7)^2\}] / (8.8)^2 = 56.5$ Based on the above formula, the minimum sample size required is 57.

Tools

Data collection tool

Data were collected using a structured questionnaire. Questions were developed by the researcher after the literature review according to the research objectives.

I. Structured patient interview questionnaire:

A structured questionnaire prepared Arabic by the researcher composed of three parts, which include:

Tool I: Part one: - demographic characteristics and clinical datasheet

The first part used to collect data about patients' ages, sex, occupation, level of education, marital status, residence, family history of the disease, and present medical history.

Part two: - Patients' knowledge questionnaire sheet regarding ulcerative colitis

It was developed by the researcher to determine patients' information about ulcerative colitis disease definition, causes, risk factors, common symptoms, complications, medication regimen, and follow-up importance. It was used in pre- and post-implementation of instructional guidelines after reviewing the related literature as reported by *Ignatavicius et al. (2021)*, *Sturm & White, (2019)* & *Selinger et al. (2012)*. This part included (35) true and

false questions. The scoring system is either satisfactory level of knowledge which equal to 60% or more (more than 21 correct answered questions) or unsatisfactory level of knowledge: less than 60% (less than 21 correct answered questions).

II: - Healthy lifestyle questionnaire: it consists of two parts

1.2 First part: Health-promoting lifestyle profile II

It was used to collect data about lifestyle modifications developed by *Walker & Hill (1996)*, translated into Arabic, modified, adapted to the Egyptian culture by the researcher, and tested for its validity and reliability by experts. The total number of fixed items is 52, and these items were modified by the researcher to the 27 used in the study, and each item had three possible responses. It was used to instrument respondents' lifestyles promoted through six subscales (ranged from 5–10 items for each) that measure the dimensions of a health-promoting lifestyle; it includes practices regarding daily habits as diet regimen practices (10 items), physical activity practices (5 items), smoking and alcohol consumption (5 items), and stress management (7 items).

A total score for overall health-promoting lifestyle was obtained through calculations. Items were scored as Never (N) = 1, Sometimes (S) = 2, and Often (O) = 3. The total score of healthy lifestyles was categorized into healthy lifestyle (>60% of the total score) and unhealthy lifestyle (<60% of the total score).

2.2 Pain assessment: pre, post and follow-up

This was done by using the visual analog scale to estimate abdominal pain intensity. Pain frequency ranged from: (0–10); No pain = 0 Mild pain = 1–3, Moderate pain = 4–7, and Severe pain = 8–10.

3.2 Patients' self-reported sheet: pre, post, and follow-up bowel elimination characteristics

It was adopted from *Teixeira, Hosne, Sobrado (2015)*, it includes items related to characteristics of bowel habits as frequency, urgency, consistency of stool, and so on.

Validity of part II:

A preliminary phase was conducted to assess the content validity of part II before its use. Initially, the content validity of the tools, their clarity, comprehensiveness, appropriateness, and relevance were reviewed by three experts, two medical-surgical nursing professors from the Faculty of Nursing, Kafr Elsheik University, and Ain shams University, and one community health nursing professor from the Faculty of Nursing, Ain shams University to test the content's validity before using it in the study. Modifications were done according to the panel judgment to ensure the clarity of sentences and the appropriateness of the content. The experts revised the developed instructional guideline that covered all items related to knowledge information and healthy lifestyle for patients with ulcerative colitis based on the current literature, the modifications were made.

The Cronbach's α test was used to assess the reliability of the questions relating to knowledge, which yielded a value of 0.869, and the reliability of the questions relating to lifestyle practices, which yielded a value of 0.894.

Pilot study & reliability

A pilot study was conducted on patients with ulcerative colitis, who represented 10% of the patients. Data obtained from these patients were not included in the existing study. The pilot study was performed to test the clarity and the applicability of the instruments and estimate the time needed to collect data and test the feasibility of the research process. The necessary modifications were made.

Ethical considerations

Before data collection, all approval letters were obtained to conduct the study after explaining the purpose of the study to the prospective participants. Official authorization was obtained through an issued letter from the Dean of the Faculty of Nursing, Kafr Elsheikh University, to the director of the Kafer Elsheit University Hospital to conduct this study and obtain permission to collect research data. Patients' verbal informed consent to participate in this study was obtained.

Data collection procedure

- **Field work**

Authorization was obtained to conduct the study from the responsible authorities of the Kafer Elsheit University hospital. The study was carried out over a period of six months from July 2020 to the end of December 2020. An outpatient exploratory visit was performed to estimate the patient frequency rate and appropriate time required to collect the data. Besides, personal communication was made with the nurses and the doctor to clarify the nature of the research and get the best possible cooperation.

After clarifying the nature and purpose of the study and obtaining their approval, patients who met the study criteria were included in the study.

- **Preparatory phase:** The healthy lifestyle program was designed by the researchers and was based on the result of the assessment; also, a review of recent, current, national, and international related literature in various aspects of ulcerative colitis was carried out.
- **Assessment Phase:** Data were collected from patients using the study tool (pre-test) via face-to-face interviews to assess the patient's knowledge and lifestyle pattern of the patient group. The researchers introduced themselves to patients, explained the aim of the study, and ensures their cooperation. Then written consent of Patients were obtained about the patient's knowledge and lifestyle pattern of the patient group.

- **Planning phase:** The contents of lifestyle modifications were formulated based on the literature. Educational sessions included the following; knowledge about ulcerative colitis such as the anatomy and physiology of the colon, definition, causes, signs, symptoms, treatment plan (which includes drug therapy, complications, and follow-up importance), and healthy lifestyle practices (such as diet modification, physical exercises, smoking and alcohol cessation, and stress management)
- **Implementation phase:** The patients in the study group were offered 30–45 minutes, consisting of 3–5 patients and performed on the basis of specific needs and the level of understanding through discussions, demonstration, and re-demonstration.

Patients were asked questions relevant to the subjects addressed in the previous session before beginning a new session to ensure that they remembered the instructions given; missing or vague points were re-emphasized by the researcher.

A copy from the instructional booklet was given to each patient. It was presented in Arabic.

- **The evaluation phase:** The effect of the lifestyle modification intervention was evaluated on knowledge and lifestyle practices after one month (post) and after three months (follow-up). Coordinated follow-up was ensured for the patients when they went to outpatient clinics. They were also followed up through phone calls.

Data analysis

Statistical package for social science (SPSS) version 25 was used for data entry and analysis. Data was presented in frequency, percentages, mean and standard deviation. Based on the normality test of the collected data, the appropriate probability chi-square (χ^2) test was used for the association.

Results

Table (1) illustrates that 61.4% of the study participants were aged between 20 years and 35 years. Females accounted for 56.1% of the study population, and 35.1% of the study participants were free work. About education, 52.6% of the study participants had attained higher education. Up to 70.2% of the study participants lived in rural areas. Also, 59.6% of their disease durations ranged from one year to five years. Up to 82.5% of the study participants did not have a family history of the condition and 47.4% of the study participants were under normal body mass index.

Table (2) clarify that 86%, 87.7%, and 73.7% of the patients in the study group had a satisfactory level of knowledge regarding items “disease meaning, risk factors, and causes,” respectively, post-intervention, while 70.2%, 59.6%, and 71.9% of the study group had satisfactory levels of knowledge regarding the same items after follow-up intervention. Concerning the common disease symptoms, there 91.2% of the study population had satisfactory levels of knowledge post-intervention. Moreover, 84.2%, 75.4%, and 91.2% of

the study group had a satisfactory level of knowledge post-intervention regarding the complication of the disease, medication regimens, and patient follow-up importance, respectively. There was a statistically significant difference in all knowledge items between pre, post, and follow-up interventions in the study group ($P < 0.05$).

Figure (1) shows that 21.1% patients had a satisfactory total level of knowledge pre-intervention; however, 84.2% of the study participants had a satisfactory total level of knowledge post-intervention and 63.2% had a satisfactory level knowledge after intervention follow-up. there were statistically significant differences between the patients in the study group pre, post, and follow-up interventions ($P < 0.001$).

Table 3: shows that 56.1%, 40.4%, 38.6%, and 56.1 of patients often adherence to diet regimens, physical activity, smoking and alcohol withdrawal, and stress management, respectively, at follow-up. There were statistically significant differences between study group pre, post, and follow-up interventions ($P < 0.001$).

Figure (2) illustrate that 50.9 % of study sample suffering to moderate pain pre intervention 73.7 %, 52.6% of study sample suffering to mild pain post and follow up respectively after intervention.

Table (4) shows the differences between the severities of symptoms among the studied patients pre, post, and follow-up interventions. It reveals that there were highly significant differences between them ($P < 0.01$).

Table (5) demonstrate that that there is no statistically significant difference between the study participants in terms of age, gender, occupation and residence, and total knowledge level pre, post, and follow-up of intervention; however, there are statistically significant differences between the participants of the study group in terms of education and total Knowledge level pre, post, and follow-up of the intervention.

Table (6) demonstrate that there was no statistically significant difference between the total knowledge level of the study participants and lifestyle modifications pre-intervention but there was a statistically significant difference between the total knowledge level of the study participants and lifestyle modifications post and follow-up the intervention ($P < 0.001$).

Table (7) shows that there statistically significant associations between the total level of knowledge and the pain level post and after the follow-up period after the intervention. Also, it clarifies that there are statistically significant associations between the pain level and lifestyle modifications post and after the follow-up period after the intervention.

Table 1. Frequency and Percentage distribution of demographic characteristics and patients' history of the ulcerative colitis patients group (n = 57 patients).

Items	Frequency	Percent
Age		
20 – 35 years	35	61.4
>35 – 50 years	15	26.3
>50 year	7	12.3
Gender		
Male	32	56.1
Female	25	43.8
Occupation		
Free worker	20	35.1
Student	5	8.8
Government employee	13	22.8
Housewife	17	29.8
Retrained	2	3.5
Education		
Basic	5	8.8
Secondary	22	38.6
Higher education	30	52.6
Resident		
Rural	40	70.2
Urban	17	29.8
Duration of disease		
1 – 5 years	34	59.6
>5 years	23	40.4
Family history		
Positive	10	17.5
Negative	47	82.5
Body Mass index		
Under Weight BMI \leq 18.5 Kg/M2	27	47.4
Normal Weight BMI=18.5-24.9 Kg/M2	18	31.6
Overweight MI=25.0-29.9 Kg/M2	12	21.1

Table 2. Frequency and Percentage distribution of the knowledge level among ulcerative colitis patients group regarding pre, post and follow up interventions(n=57)

Domain	Satisfactory level knowledge							
	Pre		Post		Follow up		X ²	P
	n	%	n	%	n	%		
Definition	4	7.0	49	86.0	40	70.2	80.196	<0.001
Risk factors	13	22.8	50	87.7	34	59.6	49.218	<0.001
Causes	7	12.3	42	73.7	41	71.9	55.874	<0.001
Common symptoms	12	21.1	52	91.2	44	77.2	67.556	<0.001
Complication	3	5.3	48	84.2	33	57.9	59.725	<0.001
Medication regimen	28	49.1	43	75.4	31	54.4	9.184	0.010
Follow up importance	17	29.8	52	91.2	29	50.9	45.367	<0.001

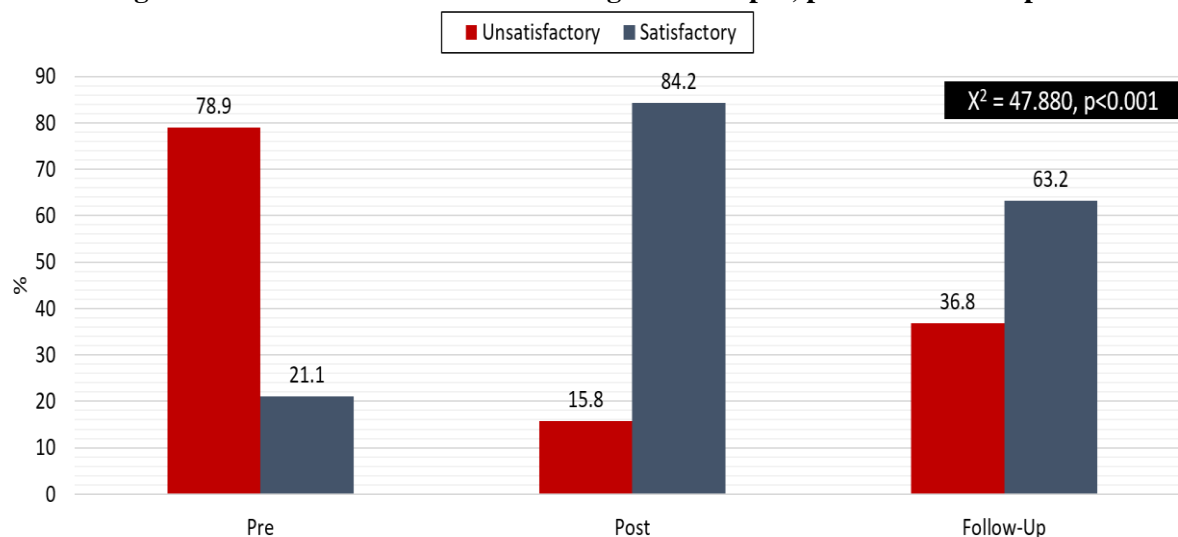
Figure 1. Distribution of Total Knowledge Level at pre, post and follow-up

Table 3. Frequency and Percentage distribution of patients' adherence to lifestyle modifications in the ulcerative colitis study group regarding pre, post, and follow-up interventions (n = 57).

Domain	Patient adherence	Pre		Post		Follow up	
		N	%	N	%	N	%
Diet regimen	Often	2	3.5	40	70.2		
	Sometime	14	24.6	10	17.5		
	Never	41	71.9	7	12.3		
physical activity	Often	3	5.3	28	49.1		
	Sometime	8	14.0	23	40.4		
	Never	46	80.7	6	10.5		
alcohol withdrawal	Often	4	7.0	28	49.1		
	Sometime	14	24.6	16	28.1		
	Never	39	68.4	13	22.8		
Stress management	Often	3	5.3	47	82.5		
	Sometime	9	15.8	10	17.5		
	Never	45	78.9	0	0.0		

Figure 2. Total abdominal pain level of the study participants regarding pre, post, and follow-up interventions (n = 57).

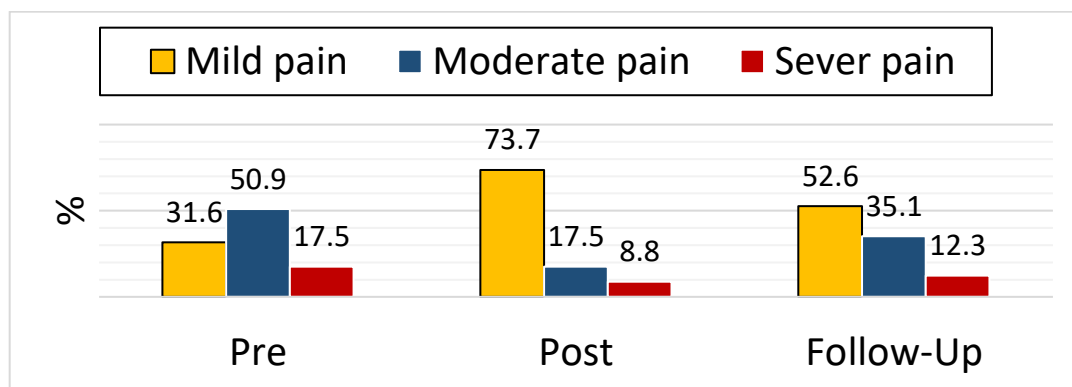


Table 4. Frequency and percentage distribution of the study sample in relation to bowel elimination characteristics of the disease pre, post, and follow-up interventions throughout the study period (n = 57).

Items	Presence of Symptoms						X ²	P
	Pre		Post		Follow up			
	N	%	N	%	n	%		
Blood in stool	19	33.3	12	21.1	7	12.3	7.376	0.025
Mucus in stool	22	38.6	15	26.3	23	40.4	2.927	0.231
Sudden need to defecate	36	63.2	22	38.6	20	35.1	10.749	0.005
Sense of incomplete evacuation urgency	49	86.0	22	38.6	29	50.9	28.372	<0.001
Bowel incontinence	27	47.4	19	33.3	14	24.6	6.624	0.036
Frequency(times/day)								
1 – 2	12	21.1	34	59.6	31	54.4		
3	38	66.7	17	29.8	19	33.3		
> 3	7	12.3	6	10.5	7	12.3	22.083	<0.001
Bowel movement								
Normal	21	36.8	45	78.9	29	50.9		
Abnormal	36	63.2	12	21.1	28	49.1	21.221	<0.001

Table 5. Association between socio-demographic characteristics and total knowledge level pre-post and after follow up intervention

Total Knowledge Level	Pre				Post				Follow up			
	Unsatisfactory (n=45)		Satisfactory (n=12)		Unsatisfactory (n=9)		Satisfactory (n=48)		Unsatisfactory (n=21)		Satisfactory (n=36)	
	n	%	n	%	n	%	n	%	n	%	n	%
Age (years)												
20 – 35	27	60.0	8	66.7	3	33.3	32	66.7	12	57.1	23	63.9
>35 – 50	13	28.9	2	16.7	4	44.4	11	22.9	4	19.0	11	30.6
>50 year	5	11.1	2	16.7	2	22.2	5	10.4	5	23.8	2	5.6
X ² [p]	0.844		[0.655]		3.566		[0.168]		4.364		[0.112]	
Gender												
Male	27	60.0	5	41.7	4	44.4	28	58.3	9	42.9	23	63.9
Female	18	40.0	7	58.3	5	55.6	20	41.7	12	57.1	13	36.1
X ² [p]	1.293		[0.255]		0.594		[0.440]		2.383		[0.122]	
Occupation												
Free worker	15	33.3	5	41.7	4	44.4	16	33.3	5	23.8	15	41.7
Student	3	6.7	2	16.7	2	22.2	3	6.3	3	14.3	2	5.6
Employee	11	24.4	2	16.7	1	11.1	12	25.0	5	23.8	8	22.2
Housewife	15	33.3	2	16.7	1	11.1	16	33.3	7	33.3	10	27.8
Retrained	1	2.2	1	8.3	1	11.1	1	2.1	1	4.8	1	2.8
X ² [p]	3.409		[0.491]		6.127		[0.189]		2.658		[0.616]	
Education												
Basic	5	11.1	0	0.0	2	22.2	3	6.3	3	14.3	2	5.6
Secondary	21	46.7	1	8.3	6	66.7	16	33.3	13	61.9	9	25.0
Higher	19	42.2	11	91.7	1	11.1	29	60.4	5	23.8	25	69.4
X ² [p]	9.341		[0.009]		7.887		[0.019]		11.081		[0.003]	
Resident												
Rural	33	73.3	7	58.3	8	88.9	32	66.7	12	57.1	28	77.8
Urban	12	26.7	5	41.7	1	11.1	16	33.3	9	42.9	8	22.2
X ² [p]	1.018		[0.312]		1.788		[0.181]		2.698		[0.100]	

(*) statistically significant at $p < 0.05$ (**) highly statistically significant at $p < 0.001$.

Table 6. Association between total knowledge level and total lifestyle level among the study (n = 57)

Items	Total Knowledge Level pre				Total Knowledge Level post				Total Knowledge Level follow up				
	Unsatisfactory (n=45)		Satisfactory (n=12)		Unsatisfactory (n=9)		Satisfactory (n=48)		Unsatisfactory (n=21)		Satisfactory (n=36)		
	n	%	n	%	n	%	n	%	n	%	n	%	
Lifestyle Level													
Healthy lifestyle	5	11.1	0	0.0	1	11.1	3	72.9	2	9.5	2	5	69.4
Unhealthy lifestyle	40	88.9	1	100	8	88.9	1	27.1	19	90.5	1	1	30.6
X ² [p]	1.462		0.226		12.442		<0.001**		19.101		<0.001**		

(*) statistically significant at p<0.05 (**) highly statistically significant at p<0.001.

Table 7 Association between total knowledge level and total lifestyle level and pain level along the study

Items	Total Knowledge Level Pre				Total Knowledge Level Post				Total Knowledge Level Follow up			
	Unsatisfactory (n=45)		Satisfactory (n=12)		Unsatisfactory (n=9)		Satisfactory (n=48)		Unsatisfactory (n=21)		Satisfactory (n=36)	
	n	%	n	%	n	%	n	%	n	%	n	%
Lifestyle Level												
Healthy lifestyle	5	11.1	0	0.0	1	11.1	35	72.9	2	9.5	25	69.4
X ² [p]	1.462		0.226		12.442		<0.001**		19.101		<0.001**	
Pain Level												
Mild	16	35.5	2	16.7	6	66.7	36	75.0	10	47.6	20	55.6
Moderate	23	51.1	6	50.0	0	0.0	10	20.8	4	19.0	16	44.4
Severe	6	13.3	4	33.3	3	33.3	2	4.2	7	33.3	0	0.0
X ² [p]	3.233		0.198		9.296		0.009*		14.597		<0.001**	

Discussion

Ulcerative colitis is a non-specific inflammatory bowel disease that is characterized by alternating periods of remission and relapse. Patients can develop ulcerative colitis at any age (from childhood onwards); however, the incidence peaks in early adulthood and is similar between men and women. The goals of current treatment methods are to induce remission of active disease and maintain durable remission over the long term while preserving a good quality of life **Hibi et al., 2020**.

Regarding socio-demographics, we found that more than half of the study participants were aged from twenty to thirty years and were females. This result is in agreement with that of a study conducted by **Gunisetty et al. (2012)** entitled "The epidemiology and prevalence of ulcerative colitis in the South of India." They found that disease prevalence was high in patients less than 35 years of age; however, males constituted the majority of patients in their study. Concerning the occupations of the participants, we found that more than one-third of the study participants were free workers, which was in line with the findings of **Calvet et al. (2018)** whose study was entitled "Patients' perceptions of the impact of ulcerative colitis on social and professional life: results from the UC-LIFE survey of outpatient clinics in Spain." Approximately half of their study participants were active workers. From the researcher's point of view that the young age of the study participants.

Regarding education, more than half of the study participants had attained higher education, a finding that was in line with those of **Nikolaus et al. (2017)** in an article entitled "Patients' education in a 14-month randomized trial fails to improve adherence in ulcerative colitis: Influence of Demographic and Clinical Parameters on Non-adherence," who reported that almost two-thirds of the participants of their study had attained higher education. As for the residence of the study participants, more than two-thirds of them lived in rural areas, which was in line with the results of the study by **Esmat et al., (2014)** entitled "Epidemiological and clinical characteristics of inflammatory bowel diseases in Cairo, Egypt" that some of the patients with ulcerative colitis resided in rural areas.

Concerning medical history, the present study revealed that the duration of illness in more than half of the study patients ranged from one to five years, which was in line with the findings of **Gennep et al. (2020)** who conducted a study entitled "Impaired Quality of Working Life in Inflammatory Bowel Disease Patients," which showed that more than half of their study participants had disease durations of more than eleven years. This similarity may be due to the fact that most of the study participants were highly educated, which enhances health awareness. Concerning patients' family histories, the current study demonstrated that most of the study participants had no family history of ulcerative disease, which was in line with the findings of **Mohamed, Ahmad, and Chanem (2007)**, who carried out a study entitled "Effect of an Educational Protocol for Patients' with Ulcerative Colitis on Their Related Knowledge and Self-Care Practices." This study demonstrated that

only one-quarter of the study participants with a contributive family history were associated with a number of gastrointestinal disorders.

Concerning the body mass index, the present study revealed that approximately half of the study participants had low body mass indexes. These were lined with the findings of **Carbonell and Chandan (2020)** who carried out a study entitled "Body Mass Index at Presentation of Inflammatory Bowel Disease in Children." They reported that half of the study participants with severe ulcerative colitis also suffered from moderate malnutrition. According to the researcher, this was due to the diet practices modification that enhanced the body weights of the study participants

Regarding knowledge about the disease meaning, risk factors, and causes, approximately two-thirds of the participants had satisfactory levels of knowledge among study group post-intervention, which was supported by the findings of **Berding et al. (2016)**, in a study entitled "Beneficial Effects of Education on Emotional Distress, Self-Management, and Coping in Patients with Inflammatory Bowel Disease." They found that an education program contributed to improvements in the disease information items.

Concerning other knowledge items (such as complications of the disease, medication regimen, and patients' follow-up importance) the study sample reported that more than two-third near to almost had satisfactory levels of knowledge post-implementation of the intervention, which was in line with the findings of **Haskey and Gibson (2017)** who carried out a study entitled "An Examination of Diet for the Maintenance of Remission in Inflammatory Bowel Disease." Diet patterns have been associated with significant improvements in health status and decreased inflammatory markers in inflammatory bowel diseases. This may be because health collaborative education is associated with decreasing complication risk of ulcerative colitis enhancing the follow-up adherence. Also, according to the findings, there was a significant difference between study participants pre, post, and follow-up implementation of the intervention in all knowledge items, which was in line with the findings of **Berding et al. (2016)** who also found significant large effects of our education program on skill and technique acquisition knowledge.

In relation to the total level of knowledge, it was illustrated that less than one-quarter of the study participants had satisfactory total levels of knowledge pre-intervention but most of them had a satisfactory total level of knowledge post-intervention, which was supported by the findings of **Mohamed, Ahmad, and Chanem (2007)**. The pre-program scores of knowledge were poor in both groups but improved after the intervention. This finding was also in line with those of **Holvoet, Lobaton, and Hindryckx (2020)** in their study entitled "Optimal Management of Acute Severe Ulcerative Colitis Challenges and Solutions." They found that rapid recognition and early disease awareness will enhance the patient's condition. It reflected the importance of the intervention on patients information

According to adherence to lifestyle modifications among ulcerative colitis patients regarding pre, post, and follow-up, more than half of the participants often adhered to the

diet regimen, less than half of them often adhered to physical activity, more than one-third of them often adhered to smoking and alcohol withdrawal, and more than half of them adhered to stress management, with statistically significant differences between study group pre, post, and follow-up interventions ($p < 0.001$) this result in accordance with those of **Solhi et al. 2020**, who conducted a study entitled "*The effect of educational intervention on health-promoting lifestyle: Intervention mapping approach.*" They showed that the intervention had a significant effect on eating behaviors after the intervention. This finding was also in line with those of **Hamilton et al. (2012)**, who carried out a study entitled "*Using a single-item physical activity measure to describe and validate parents' physical activity patterns,*" they found subjective norms of physical activity in the intervention group increasing significantly after the intervention compared to the control group. From the researcher's point of view, changing daily healthier habits will positively affect a person's health and protect them from serious health problems.

Regarding the classification of abdominal pain, half of the study participants experienced moderate pain pre-intervention. More than two-thirds and approximately half of the study participants experienced mild pain post and follow-up intervention, respectively. Similar results were reported by **Flik et al. (2015)**, in a systematic review entitled "Knowledge and educational needs of patients with irritable bowel syndrome." They found that there was a significant improvement in patients' symptoms severity of studied patients upon pre- and post-test comparison, and the mean symptom severity scores decreased significantly after the implementation of the intervention. This may be due to the patients' craving to learn and practice relieving strategies to overcome this overwhelming problem that bothers them. Also, educating patients regarding changes in diet and lifestyle may help them control pain and lengthen the time between flare-ups. Inflammation is the major cause of pain, and colitis plays a role in intestinal inflammation.

Regarding bowel elimination characteristics of the disease, the study reveals that there were significant associations between bowel elimination pre, post, and follow-up, which was in line with the findings of **Hibi et al. (2020)** who carried out a study entitled "Ulcerative Colitis: Disease Burden, Impact on Daily Life, and Reluctance to Consult Medical Professionals: Results from a Japanese Internet Survey," and reported that ulcerative colitis significantly affects daily life, largely due to symptoms such as bowel urgency and bowel incontinence. Despite desiring to improve bowel incontinence, after consulting physicians or nurses, active efforts should be made to teach patients' individual dealing with symptoms. This was also in line with the findings of **Waalaa et al. (2018)** in their study entitled "Probiotics for improving quality of life in ulcerative colitis: Exploring the patient," who mentioned that patients, after changing their daily life health routine, felt physically better overall and experienced changes such as a lower stool frequency, enhanced stool texture, decreased urgency, and better bowel emptying.

The present study revealed no significant associations between age, sex, occupation, residence, and total knowledge level but there were statistically significant differences between education and total Knowledge Level pre, post, and follow-up of the intervention; This is finding is in line with **Maria et al. (2013)** who carried out a study entitled "Health-related quality of life in patients with inflammatory bowel disease: a single-center experience." They reported that age, sex, and place of residence were not significantly associated with the total score of patients' knowledge. On the contrary, **Abed et al. (2015)**, in their study entitled "Effect of educational program on improving psychological status and quality of life among patients with ulcerative colitis found that there was no significant association between study group education and total knowledge score pre- and post-intervention.

The current study revealed no statistically significant difference between the socio-demographic characteristics of the study participants (age, sex, and occupation) and total lifestyle modification, except study participants' education level, residence, and total level lifestyle modification pre, post, and follow-up of implementation the intervention ($P < 0.001$). This result is in contrast with that of a study conducted by **Guida et al. (2021)** entitled "Perception of the Role of Food and Dietary Modifications in Patients with Inflammatory Bowel Disease: Impact on Lifestyle." They found a statistically significant difference between age and sex of patients and total lifestyle modifications. This result was also in line with those of a study carried out by **Talley et al. (2005)** entitled "Diagnostic Value of the Manning Criteria in Irritable Bowel Syndrome." They reported a statistically significant difference between the education of patients regarding changes in diet and lifestyle total level lifestyle modification.

The association between the total knowledge level and lifestyle modifications post and follow-up the educational session was significant ($P < 0.001$). The finding was in line with those of the study by **Mohamed et al. (2007)**, in their study entitled "Effect of an Educational Protocol for Patients' with Ulcerative Colitis on Their Related Knowledge and Self-Care Practices." After the intervention, they found statistically significant improvements in both knowledge and lifestyle modification. From the researcher's point of view, lifestyle modifications might include diet modifications and exercise, which are taken into account when designing and implementing the present study. This might explain its success in improving patients' knowledge and lifestyle.

The association between the total level of knowledge, pain, and lifestyle modification, was statistically significant ($P < 0.001$). This result is in line with those of **Magharei et al. (2019)** who conducted a study entitled "Effects of Self-Management Education on Self-Efficacy and Quality of Life in Patients with Ulcerative Colitis: A Randomized Controlled Clinical Trial." They found that education had significant effects on knowledge and pain after the intervention.

Recommendation

Follow-up visits either to gastrointestinal outpatient clinics or through home visits or telephone visits should be implemented as they are very important to evaluate the progress of patients' conditions and motivate them to adopt a healthy lifestyle to prevent complications and maintain a good quality of life.

- An educational unit for patients with ulcerative colitis should be established.
- More studies should be carried out to evaluate the effectiveness of the long-term follow-up of lifestyle modification educational sessions on patients with ulcerative colitis.

Conclusion

Patients with ulcerative colitis adhering to lifestyle modifications demonstrated a significant positive improvement in their knowledge, modifications in their lifestyle practices, and all dimensions of patient's experiences such as pain level and bowel characteristics. Therefore, lifestyle modification is considered an effective non-pharmacological intervention in patients with ulcerative colitis and is also effective in preventing recurrence.

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ملخص العربي

التهاب القولون التقرحي هو مرض التهابي مزمن يصيب القولون ، وتتنزأد معدلات حدوثه في جميع أنحاء العالم. ويحدث الي عوامل متعددة ، كالأستعداد الوراثي والعوامل البيئية.

الهدف: هدفت الدراسة إلى تقييم تأثير تعديل نمط الحياة على مرضى التهاب القولون التقرحي.

طريقة البحث: تم الإعتدأد على إعتدأد تصميم بحثي شبه تجريبي (قبل وبعد الإختبار) للدراسة الحالية. وأجريت الدراسة هذه الدراسة في العيادة الخارجية للجهاز الهضمي في مستشفى جامعة كفر الشيخ و كان حجم العينة 57 مريضاً يعانون من التهاب القولون التقرحي.

أدوات البحث: استخدم استبيانات يتم ملؤها تم استخدام استبيان مقابلة المريض المنظم وأدوات استبيان نمط الحياة الصحي لجمع البيانات ويتألف من جزئين : البيانات الديموغرافية ، قياس معرفه المرضي عن المرض ، واستبيان نمط الحياة الذي تكون من ثلاثة أجزاء ويتم قياس الادوات قبل وبعد التدخل.

النتائج: أظهرت النتائج أن 64أوضحت نتائج الدراسة أن (56.1%) من المشاركين في الدراسة كانوا من الذكور بينما (43.8%) من الإناث. أظهرت النتائج أن النتائج المعرفية الإجمالية للتدخلات اللاحقة للمرضى قد تحسنت مقارنة بالدرجات السابقة لهم ، بالإضافة إلى زيادة النتيجة الإجمالية للالتزام بنمط الحياة الصحي بعد تدخلات الدراسة والمتابعة مقارنة بالتدخل السابق ذي الدلالة الإحصائية العالية.

الخلاصة: طبقاً لى نتائج هذه الدراسة اتضح أنه يمكن أن تكون تعديلات نمط الحياة فعالة في تحسين النتائج.

التوصيات: توصي الدراسة بتكرار الدراسة على عينة احتمالية أكبر يتم إختيارها من مناطق جغرافية مختلفة في مصر إلى بيانات أكثر قابلية للتعميم وعمل كتيب تعليمي تثقيفي للمرضى ونشره علي صفحات التواصل للتوعيه .