The Effect of an Educational Intervention Program on Self-Efficacy, Self-Care and Nutritional Practices among Adolescents with Inflammatory Bowel Disease

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Abstract

Background: Adolescents with inflammatory bowel disease (IBD) suffer from various physical as well as psychological impairments, and the educational intervention may be helpful in improving their self-efficacy, self-care and nutritional practices. **Subjects and Methods:** A quasi-experimental pre–posttest design with follow-up was conducted on 40 adolescents with IBD at the Pediatric Gastroenterology Outpatient Clinics of Zagazig University Hospital and the Ulcerative Colitis & Crohn's Disease Outpatient Clinic. **Data collection instruments** included a structured interview questionnaire, self-efficacy scale, self-care assessment tool, and nutritional beliefs and behaviors questionnaire. **Results**: The educational program produced highly significant improvements **(P<0.001)** in self-efficacy and self-care. Additionally it significantly enhanced adolescents' dietary practices and beliefs in managing IBD, lead to higher diet adherence, healthier lifestyle habits, greater supplement use, and stronger recognition of nutrition's role in relapse control and treatment. **Conclusion:** The educational program had a positive impact on adolescents with IBD, enhancing adolescent's self-efficacy, self-care and nutritional practices **Recommendation:** Educational intervention programs should be incorporated into standard care to help adolescents with IBD improve their self-care skills and adopt healthy nutritional practices.

Keywords: *Adolescent's IBD, Self-Efficacy, Self-Care, Nutritional Practices*

Introduction

Inflammatory bowel disease (IBD) is a group of chronic, relapsing, and remitting inflammatory disorders of the gastrointestinal tract, primarily comprising Crohn's disease (CD) and ulcerative colitis (UC). These conditions result from a dysregulated immune response to intestinal microbiota in genetically predisposed individuals, influenced by environmental factors (Ungaro.,etal 2017).

The incidence of IBD is rising most rapidly among children and adolescents, with global prevalence shifting from mainly Western regions to Asia and North Africa, including Egypt, largely due to urbanization and lifestyle changes (Hammer & Langholz, 2020).

The pathogenesis of IBD involves an abnormal immune response to gut microbiota in genetically susceptible individuals, aggravated by triggers such as diet, infections, and stress. Th1 (T-helper 1) cells are a type of immune cell that release cytokines driven, deep "transmural" inflammation.pathways dominate in Crohn's disease and Th17 Elevated IL-17 and IL-22 recruit neutrophils, causing superficial mucosal inflammation confined to the colon and rectum. responses in ulcerative colitis, driving cytokine release and chronic inflammation (Abdulla & Mohammed, 2022).

Additional risk factors that may be cause the IBD include poor diet, inactivity, appendectomy, childhood gastroenteritis, antibiotics, and early gluten or sugar exposure(**Hasosah et al., 2022).**

IBD includes Crohn's disease (CD), a trans mural condition affecting any GI site with granulomas, and ulcerative colitis (UC), limited to superficial colonic inflammation. About 20% present in adolescence: CD with abdominal pain, diarrhea, weight loss; UC with bloody diarrhea. diagnosis relies on clinical, labs, ileocolonoscopy, endoscopy with biopsies, and imaging (**Grover, De Nardi and Lewindon, 2017).**

Self-efficacy is adolescents' belief in their ability to manage health behaviors. In IBD, low self-efficacy is linked to stress, symptom, and disease control, while higher levels reduce daily disease burden. Since it can be developed, interventions like cognitive behavioral therapy and motivational interviewing enhance self-efficacy. Effective self-management—actions to control a chronic condition—is strongest when it supports self-efficacy. (**Sheehan et al., 2023).**

For adolescents with IBD, self-care includes diet, medication adherence, physical activity, and psychotherapy, focusing on disease control and overall well-being through maintenance, monitoring, and management. Resilience enhances stress coping, adherence, and quality of life. Treatment involves nutritional therapy and medications: aminosalicylates for mild UC, corticosteroids for moderate–severe disease, immunomodulators for remission, and biologics or JAK inhibitors for refractory cases **(Torres et al., 2020)**.

Diet is a modifiable factor in disease management, with a Mediterranean-style diet generally well tolerated and symptom-improving. Fibrous foods may require texture modification in patients with strictures. During active Crohn's disease, exclusive enteral nutrition (EEN) can induce remission, while parenteral nutrition is needed if oral intake is not possible. Nutritional strategies should be individualized and managed collaboratively **(Hashash et al., 2024).**

Nutritional management in IBD includes small, frequent meals with varied foods. Fiber is limited during flares and gradually reintroduced, with further restriction in stricturing Crohn's disease and high-residue diets for ulcerative proctitis. Gas-producing vegetables should be avoided, fruits and vegetables are better tolerated cooked or peeled, dairy is maintained unless intolerant, fats limited, and lean proteins preferred. Reducing FODMAPs may ease symptoms, fluids should be adequate, and sugary drinks, caffeine, and alcohol limited. Probiotics may benefit mild-to-moderate UC but not active CD. Supplementation with iron, calcium, vitamin D, folic acid, or B12 is recommended as needed**(Shafiee et al., 2021).**

Significance of the study

Inflammatory bowel disease (IBD) is a chronic, relapsing disorder often diagnosed in adolescence, that it is a critical period of physical, psychological, and social development. Its incidence is rising, with extensive gastrointestinal involvement—including multi-segment Crohn's disease or pancolitis in ulcerative colitis—causing complications such as weight loss, anemia, school absenteeism, and poor medication adherence, negatively affecting quality of life **(Kuenzig et al., 2022)**. Adolescents are especially vulnerable to nutritional deficiencies and difficulties in managing their illness, highlighting the need to improve self-efficacy, self-care, and dietary practices.

Aim of the study

This study aimed to evaluate the effect of an educational intervention program on self-care, self-efficacy, and nutritional practices in adolescents with inflammatory bowel disease (IBD).

Research design

In the study a prospective quasi experimental design (pre, posttest and follow up)was used.

Research hypothesis

- Self-care of adolescents with inflammatory bowel disease (IBD) will improve following the implementation of an educational support program.
- Self-efficacy of adolescents with IBD will increase after participation in the educational program.
- Nutritional practices of adolescents with IBD will be enhanced as a result of the educational

intervention.

Subjects and Method

Setting

The study was carried out at Pediatric gastroenterology outpatient clinics at zagazig university hospital &outpatient clinic of ulcerative colitis &crohn's disease at Zagazig University **Subjects**

The study included 40 adolescents diagnosed with crohn's disease or ulcerative colitis. At the age from 12 to18 year. From both gender. with the Absence of cognitive disorder or other chronic disease.

Tools for data collection

Tool (I): structured interview Questionnaire:

Tool (1) A structured interview questionnaire was designed by the researcher and had the following parts:

Part A:. Demographical data of the parents of the studied adolescents such as age, sex, residence and level of education

Part B :Demographical data of the studied adolescents such as age, sex, and level of education.

Tool II: The self-efficacy scale, adopted from **Graff et al., (2016)** and translated into Arabic by the researcher, was used to assess adolescents' confidence in carrying out self-management tasks over the past two weeks. It contains 29 items across four domains: managing stress and emotions, managing medical care, managing symptoms, and maintaining remission. Responses are rated on a **10-**point Likert scale, with higher scores reflecting stronger self-efficacy. Data were collected at three stages: pre-test, post-test (3 months), and follow-up (another 3 months).

Tool (III): The self-care scale, adapted from **Wickman et al. (2018)** and culturally tailored into a 19-item .Arabic version, was applied to evaluate adolescents' engagement in routine self-care. It measures areas such as symptom monitoring, treatment adherence, daily life adaptation, preventive practices, and healthcare navigation. Items are rated on a **4-**point scale ranging from "not relevant" to "always relevant," with higher scores indicating greater consistency in self-care. assessments were conducted at the same three time points.

Tool IV: Dietary behaviors and beliefs questionnaire .It was adopted from **Jeanne, Milou &PetraBen,(2019)** explored the adolescents' dietary behaviors and beliefs related to IBD. It covers food modifications, supplement use, and lifestyle adjustments, as well as attitudes toward the role of nutrition in symptom control and relapse prevention. The Arabic version was used at three stages of data collection.it has no scoring system it is descriptive, focusing on identifying patterns in dietary behaviors and beliefs.

Method

Validity and reliability

All the study tools were examined by three professors two in pediatric nursing and one in medical and surgical nursing. All jury members agreed (100%) that the existing research tools and their validity were relevant to the study purpose. The Cronbach's alpha test was used to judge the tools reliability**.** The reliability coefficient was (0.971) for self-efficacy and(0.777) for self-care.

Ethical consideration:

The Zagazig University Faculty of Nursing's Research Ethics Committee gave its approval to the study. According to ethical guide lines, all participants received written notification of the main objectives of the study, and the gathered information would only be utilized for scientific reasons .Additionally, the confidentiality of the participants' identities and all data received will be ensured. In addition, they were advised that they might withdraw from the study at any point and that they could choose not to participate.

Pilot study

A pilot study with four of IBD adolescents was conducted to evaluate the clarity and applicability of the instruments and estimate the time needed to collect all the data .Those studied adolescents who took part in the pilot study were included in the total simple.

Field work

Beginning in january 2024 until the end of September 2024. The data collection period extended over 9months, during which the researcher conducted visits to the designated locations twice a week during the morning hours from 9:00 am to 1:00 pm, using their established data collection methods.

Statistical design:

Data were analyzed using IBM SPSS for Windows, version 25 (IBM Corp., Armonk, NY, USA, 2017). Quantitative data were expressed as

Reliability was evaluated using Cronbach's alpha, and a p-value < 0.05 was considered statistically significant. qualitative data as frequencies and percentages. Statistical tests included the McNemar test for paired categorical data, paired t-test and one-way ANOVA for normally distributed used to assess relationships**.**

Results

Table (1) shows the demographic characteristics of the studied inflammatory bowel disease adolescent's parents. In relation to adolescents' fathers educational level, It was found that one third of adolescent's fathers had completed a university education and most were employed .Regarding adolescent's mothers, the results showed that 40% had a secondary school and 70% were house wives .The same table showed that 87,5% of both parents didn't have inflammatory bowel disease and 75 % were from rural areas. There was no association found in relation to parental consanguinity.

Demographic characteristics of the studied adolescents are portrayed in **table (2).**It was found that most of the studied adolescents were male. with meaning age over 15 years . Regarding educational level, the majority of the studied adolescents were at secondary school.

Effect of the educational intervention program on total mean scores of the self-efficacy and its domains as reported by the studied adolescents was illustrated in **table(3).** It was found that there was noticeable improvement in the self-efficacy of the studied adolescents including management of stress, medical care, symptoms of disease ,maintain of remission . Furthermore a highly statistically significant difference **(P<0.001**) was found regarding the total mean score of IBD self-efficacy throughout the program phases .

Fig (1) shows the total mean score of self-care. The mean score at the pre-intervention phase was 46.8**,** represented the lowest value. After the intervention, the mean score increased markedly to 56.45**,** reflected a clear improvement and at the follow-up phase, the mean score showed a slight decline to 56.02, however, it remained higher than the pre-intervention level, indicated that the improvement was largely sustained over time with highly statistically significant difference **(P<0.001)**.

Table (4) illustrates the effect of the educational intervention program on dietary behaviors of the studied adolescents about IBD throughout the study phases. There was highly statistically significant difference **(P<0.001)** in post implementation phase regarding dietary behaviors. It was found that IBD adolescents who followed a diet increased from 50% in pre implementation to 97.5% of post implementation of program. Also regarding disease symptoms, diarrhea was the most common symptoms that was reduced by omitting foods as spicy ,fatty foods.

Concerning nutrition and lifestyle adaptations , 100% of the studied used regular meals, practiced sports /exercise, used more frequent smaller portions and used relaxation technique in the post implementation phase of the program .Also IBDs adolescents who used food supplement increased from 32.5%to 92.5% in pre &post phase respectively

Effect of the educational intervention program on dietary believes of the studied adolescents about IBDs throughout the study phases are shown in **table (5) .**When the results were analyzed ,it was revealed that there were highly statistically significant difference**(P<0.001)** regarding the dietary believes of the studied adolescents between the pre and post implementation phases of the study.

More than half of the studied adolescents believed that they can end relapse faster through proper

nutrition in the pre implementation phase and this percentage increased to 97.5% and 95.0% in the post and follow up phases respectively.

Concerning the importance of nutrition compared to medicine, 25% of the studied adolescents believed that nutrition and medicine were equally in important in the pre implementation phase and this percentage changed to 37.5% , 40 %in the post implementation phase and the follow up implementation phases respectively .

Table (6) portrays the relation between demographic characteristics of the studied parents and adolescent's total self-efficacy score. It was found that father's educational level had significant relation with adolescent's total self-efficacy score in pre phase. Also it was found that residence had significant relation with adolescent's total self-efficacy score in post &follow up phase

Relation between demographic characteristics of the studied parents and adolescent's total Self-care score is illustrated **in table (7),** which revealed that there was a highly significant relation between parents who had inflammatory bowel disease and relative degree with adolescent's total self-care score in pre ,post phase &follow up phase .Regarding residence there was a highly significant relation with adolescent's total Self-care score in the pre implementation phase .

Table (1): Demographic Characteristics of the Studied Adolescent's Parents about Inflammatory Bowel Disease (n=40)

Characteristics	No.	%
Father's educational level		
Illiterate	13	32.5
Primary school	1	2.5
Preparatory	3	7.5
Secondary	9	22.5
University	14	35.0
The father's occupation		
Working	27	67.5
Not working	13	32.5
Mother's educational level		
Illiterate	14	35.0
Primary school	1	2.5
Preparatory	3	7.5
Secondary	16	40.0
University	6	15.0
The mother's occupation		
Working	12	30.0
Housewife	28	70.0
Parents also has IBD		
Yes	5	12.5
No	35	87.5
Residence		
Rural	30	75.0
Urban	10	25.0
Parental consanguinity		
Yes	6	15.0
No	34	85.0
Relative degree (n=6)		
Fourth	6	15

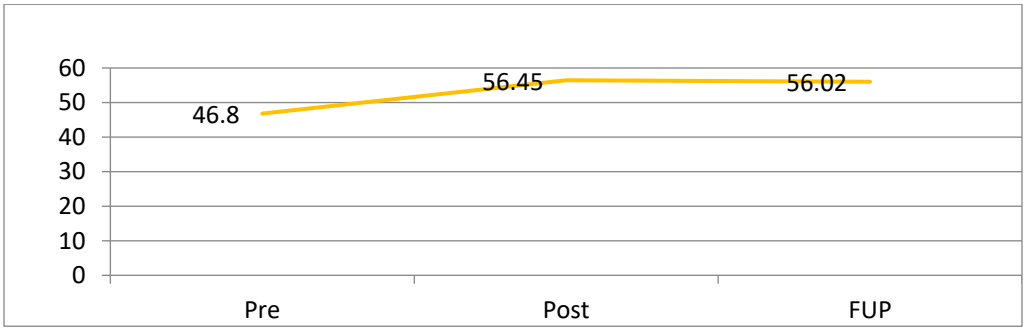
Table (2): Demographic Characteristics of the Studied Adolescents with IBD (n=40).

Characteristics	No.	%
Gender		
Male	22	55.0
Female	18	45.0
Age (in years)		
12-	9	22.5
14-	9	22.5
16 -18	22	55.0
Adolescents educational level		
Primary school	1	2.5
Preparatory	8	20.0
Secondary	24	60.0
University	7	17.5

Table (3): Effect of the Educational Intervention Program on Total Mean Scores of Self-Efficacy and It's Domains as Reported by the Studied Adolescents throughout the study phases (n=40).

Scores	Pre	Post	FUP	Paired t-test (P1)	Paired t-test (P2)
Managing stress and emotions	40.35±10.78	56.67±8.94	53.80±8.57	-8.959(<0.001**)	-4.004 (<0.001**)
Managing medical care	36.45±6.95	49.60±7.83	48.95±7.64	-10.794(<0.001**)	-1.986 (0.054)
Managing symptoms and disease	30.90±9.16	46.35±8.75	44.85±8.06	-12.029(<0.001**)	-3.703 (<0.001**)
Maintaining remission	18.20±5.21	26.70±4.32	26.20±4.13	-11.892(<0.001**)	-2.265 (0.029*)
Total	125.90±28.10	179.32±28.12	173.80±26.12	-12.276(<0.001**)	-4.120 (<0.001**)

Non-significant (p>0.05), *: statistically significant (p<0.05), **: statistically highly significant (p<0.01)



Fig(1): Effect of the Educational Intervention Program on Total Mean Score of Self-Care as Reported by the Studied Adolescents about IBDS throughout the Study Phases (N=40).

Figure 1: line graph showing total mean score of Self-care as reported by the studied adolescents throughout the study phases.

non-significant(p>0.05), **: statistically highly significant (p<0.01), p^1: for comparison between pre-educational and post-educational, p^2: for comparison between post-educational and follow up phase.

Table (4): Effect of the Educational Intervention Program on Dietary Behaviors of the Studied Adolescents about IBDs throughout the study phases (n=40).

Dietary behaviors	Pre-test		Post-test		Follow up		MC p1	MCp2
	No.	%	No.	%	No.	%		
Have you followed a diet for your IBD?	20	50.0	39	97.5	39	97.5	<0.001**	**0.99**
Do you omit foods in order to reduce disease symptoms?	31	77.5	40	100.0	39	97.5	<0.001**	**0.981**
Disease symptoms that are reduced by omitting foods(spicy ,fatty food)								
-Abdominal Pain	10	32.3	10	25.0	10	25.6		
-Diarrhea	11	35.5	12	30.0	11	28.2		
-Relapse	6	19.3	9	22.5	9	23.1	<0.001**^	0.981^
-Fatigue	4	12.9	9	22.5	9	23.1		
Do you eat more of certain foods that have a beneficial effect on disease symptoms?	23	57.5	40	100.0	40	100.0	<0.001**	0.999
Disease symptoms that are improved by eating more of certain foods								
-Abdominal Pain	5	21.7	10	25.0	12	30.0		
-Diarrhea	7	30.4	12	30.0	10	25.0		
-Relapse	6	26.2	13	32.5	12	30.0	<0.001**^	0.881^
-Fatigue	5	21.7	5	12.5	6	15.0		
Nutrition and lifestyle adaptations to reduce disease symptoms*								
-regular meals	8	20.0	40	100.0	37	92.5	<0.001**<	0.543
-sports/exercise	6	15.0	40	100.0	37	92.5	0.001**	0.543
-More frequent smaller portions	7	17.5	40	100.0	37	92.5	<0.001**<	0.543
-Relaxation (mindfulness/meditation)	6	15.0	40	100.0	37	92.5	0.001**	0.543
Do you use food supplements?	**13**	**32.5**	**37**	**92.5**	**35**	**87.5**	<0.001**	0.893
-Reason for supplement use								
-Improve health	4	30.8	20	54.1	18	51.4		
-Reduce fatigue	5	38.4	11	29.7	13	37.1	<0.001**^	0.891^
-Reduce symptoms	2	15.4	4	10.8	3	8.6		
-Prevent relapse	2	15.4	2	5.4	1	2.9		
-others	0	0.0	0	0.0	0	0.0		
Do you use (foods enriched with) pre- and probiotics?	**9**	**22.5**	**36**	**90.0**	**35**	**87.5**	<0.001**	0.982
-Reason for pre- and probiotics use								
-Improve health	3	33.4	25	69.5	24	68.6		
-Reduce fatigue	2	22.2	5	13.9	5	14.4	<0.001**^	0.998^
-Reduce symptoms	2	22.2	3	8.3	3	8.5		
-Prevent relapse	2	22.2	3	8.3	3	8.5		
-others	0	0.0	0	0.0	0	0.0		
Reason for supplement use								
-Improve health	4	30.8	20	54.1	18	51.4	<0.001**^	0.891^
-Reduce fatigue	5	38.4	11	29.7	13	37.1		
-Reduce symptoms	2	15.4	4	10.8	3	8.6		
-Prevent relapse	2	15.4	2	5.4	1	2.9		
Do you use foods enriched with pre- and probiotics?	9	22.5	36	90.0	35	87.5	<0.001**	0.982
-Reason for pre- and probiotics use								
-Improve health	3	33.4	25	69.5	24	68.6		
-Reduce fatigue	2	22.2	5	13.9	5	14.4	<0.001**^	0.998^
-Reduce symptoms	2	22.2	3	8.3	3	8.5		
-Prevent relapse	2	22.2	3	8.3	3	8.5		

MC: Mcnemar test, ^: marginal homogeneity test, non-significant(p>0.05), **: statistically highly significant (p<0.01), p^1: for comparison between pre-educational and post-educational, p^2: for comparison between post-educational and follow up phas

Table (5): Effect of the Educational Intervention Program on Dietary Believes of the Studied Adolescents About IBDS throughout the Study Phases (N=40).

Dietary believes	Pre-test		Post-test		Follow up		MC p1	MCp2
	No.	%	No.	%	No.	%		
Do you believe that nutrition is the most important cause of your IBD?	19	47.5	34	85.0	32	80.0	<0.001**	**0.891**
Do you believe that nutrition plays an important role in causing relapse?	24	60.0	39	97.5	38	95.0	<0.001**	**0.998**
Do you believe you can end the relapse faster through proper nutrition?	21	52.5	39	97.5	38	95.0	<0.001**	**0.998**
Do you expect to gain more control over your IBD through nutrition in the future?	25	62.5	38	95.0	37	92.5	<0.001**	**0.988**
Are you successful in controlling your disease symptoms by adapting your nutrition?								
Always	1	2.5	33	82.5	30	75.0	<0.001**^	**0.564^**
Only during relapse	4	10.0	2	5.0	5	12.5		
Only during remission	10	25.0	3	7.5	3	7.5		
No	25	62.5	2	5.0	2	5.0		
What is the importance of nutrition compared to your medicine?								
Most important	2	5.0	20	50.0	19	47.5	<0.001**^	**0.985^**
Equal important	10	25.0	15	37.5	16	40.0		
Less important	15	37.5	3	7.5	3	7.5		
Not important	13	32.5	2	5.0	2	5.0		
Do you believe that your IBD decreases your appetite?								
Always	6	15.0	25	62.5	24	60.0	<0.001**^	**0.988^**
Only during relapse	6	15.0	10	25.0	12	30.0		
Only during remission	4	10.0	5	12.5	2	5.0		
no	24	60.0	0	0.0	2	5.0		
How would you indicate your appetite during remission?								
Poor	5	12.5	3	7.5	4	10.0		
Fair	13	32.5	12	30.0	11	27.5	**0.645^**	**0.981^**
Good	17	42.5	20	50.0	20	50.0		
Very good	5	12.5	5	12.5	5	12.5		
How would you indicate your appetite during relapse?								
Poor	30	75.0	29	72.5	30	75.0		
Fair	5	12.5	6	15.0	5	12.5	**0.981^**	**0.981^**
Good	3	7.5	3	7.5	3	7.5		
Very good	2	5.0	2	5.0	2	5.0		

MC: Mcnemar test, ^: marginal homogeneity test, non-significant(p>0.05), **: statistically highly significant (p<0.00), p^1: for comparison between pre-educational and post-educational, p^2: for comparison between post-educational and follow up phase.

Table(6): Relation between demographic characteristics of the studied parents and adolescent's total self-efficacy score.

Characteristics	Total self-efficacy score		
	Pre	post	Follow up
Father's educational level			
Illiterate	99.22±27.92	187.23±12.50	184.00±13.07
Primary school	114.0±0.0	191.00±0.0	187.00±0.0
Preparatory	126.50±9.37	167.33±23.09	166.66±23.67
Secondary	132.33±42.14	163.88±49.67	159.00±45.59
Universe	143.15±27.88	183.64±18.36	174.42±15.56
F (p-value)	**4.554 (0.005**)**	1.224 (0.318)	1.394 (0.256)
The father's job			
Working	124.37±30.71	177.25±32.95	170.51±29.75
Not working	129.07±22.52	183.61±13.72	180.61±14.96
t (p-value)	-.491 (0.626)	-.665 (0.510)	-1.150 (0.257)
Mother's educational level			
Illiterate	127.50±23.26	184.0±15.98	181.64±14.83
Primary school	181.00±0.0	193.0±0.0	194.00±0.0
Preparatory	123.66±10.69	183.66±19.65	176.00±20.22
Secondary	120.12±35.75	171.93±38.37	165.00±35.76
Universe	129.50±11.57	183.66±25.04	174.50±15.65
F (p-value)	1.194 (0.331)	0.458 (0.766)	0.918 (0.465)
The mother's job			
Working	126.91±9.91	184.08±20.35	173.41±15.68
Housewife	125.46±33.17	177.28±30.97	173.96±29.75
t (p-value)	0.211 (0.834)	0.696 (0.491)	-.060 (0.952)
Parents also has IBD			
Yes	142.00±28.37	173.60±16.81	168.60±13.64
No	123.60±27.70	180.14±29.47	174.54±27.49
t (p-value)	1.385 (0.174)	-.482 (0.633)	-.471 (0.640)
Residence			
Rural	123.70±30.22	175.16±30.14	170.36±28.68
Urban	132.50±20.39	191.80±16.38	184.10±12.18
t (p-value)	-.854 (0.398)	**-2.200 (0.036*)**	**-2.112 (0.042*)**
Parental consanguinity			
yes	122.33±9.39	180.00±14.50	179.16±13.61
no	126.52±30.28	179.20±30.04	172.85±27.78
t (p-value)	-.333 (0.741)	0.063 (0.950)	0.541 (0.592)
Relative degree (n=6)			
Fourth	118.66±7.50	170.33±14.43	171.00±15.58
t (p-value)	-.946 (0.398)	-2.136 (0.099)	-1.743 (0.156)

F: one way ANOVA, t: student t-test, Non significant(p>0.05), *: statistically significant (p<0.05), **: statistically highly significant (p<0.001).

Table(7): Relation between demographic characteristics of the studied parents and adolescent's total Self-care score .

Characteristics	Total Self-care score		
	Pre	post	Follow up
Father's educational level			
Illiterate	48.23±7.00	57.46±3.97	57.00±4.26
Primary school	46.00±0.0	54.00±0.0	54.00±0.0
Preparatory	44.66±4.04	51.66±0.57	51.66±0.57
Secondary	46.22±4.60	55.88±3.05	56.0±3.08
Universe	46.35±7.49	55.85±3.15	57.42±2.90
F (p-value)	0.268 (0.896)	1.962 (0.122)	2.031 (0.111)
The father's job			
Working	47.03±6.80	55.51±3.46	56.07±3.71
Not working	46.30±5.46	57.07±3.52	57.23±3.26
t (p-value)	0.337 (0.738)	-1.324 (0.193)	-0.958 (0.344)
Mother's educational level			
Illiterate	45.71±5.10	56.50±3.89	56.35±4.01
Primary school	42.00±0.0	51.00±0.0	51.00±0.0
Preparatory	43.33±6.80	57.33±3.21	54.66±0.57
Secondary	48.62±6.29	55.56±3.09	56.31±3.47
Universe	47.00±9.09	56.33±4.08	58.83±2.56
F (p-value)	0.785 (0.543)	0.737 (0.573)	1.521 (0.217)
The mother's job			
Working	47.50±7.56	56.58±3.31	57.75±2.73
Housewife	46.50±5.87	55.78±3.63	55.89±3.78
t (p-value)	0.452 (0.654)	0.652 (0.518)	1.532 (0.134)
Parents also has IBD			
Yes	56.80±3.83	59.00±1.22	59.00±1.22
No	45.37±5.25	56.08±3.65	55.60±3.54
t (p-value)	**4.667 (0.001**)**	**3.529 (0.003**)**	**2.108 (0.042*)**
Residence			
Rural	48.70±6.06	56.50±3.37	56.70±3.63
Urban	41.10±2.72	54.60±3.74	55.70±3.46
t (p-value)	**3.808 (0.001**)**	1.502 (0.141)	0.762 (0.451)
Parental consanguinity			
yes	49.00±7.84	57.33±2.65	57.50±2.42
no	46.41±6.09	55.79±3.63	56.26±3.73
t (p-value)	0.920 (0.363)	0.987 (0.330)	0.777 (0.442)
Relative degree (n=6)			
Fourth	55.00±5.19	59.33±0.57	59.33±0.57
t (p-value)	**3.065 (0.037*)**	**2.910 (0.044*)**	**2.940 (0.042*)**

F: one way ANOVA, t: student t-test, Non significant(p>0.05), *: statistically significant (p<0.05), **: statistically highly significant (p<0.001).

Discussion

Inflammatory bowel disease (IBD) is a chronic relapsing gut disorder increasingly affecting adolescents, requiring strong self-management skills during growing independence. Self-management interventions aim to help adolescents cope with daily challenges, enhance understanding of the disease, and promote adherence, symptom control, and emotional regulation **(Catarino, Charepe & Festas, 2021).** Accordingly, this study developed and applied an educational program aimed at enhancing adolescents' self-care, self-efficacy, and promoting healthy dietary practices.

The results of the current study revealed that three quarter of adolescent's parents with IBD were from rural areas (75%) and this was matched with **Elbadry .,etal (2022)** he found that more than half of the study population were from rural areas. The higher proportion were from rural areas may be attributed to limited access to healthcare, unhealthy dietary (such as low fiber, high-fat, or unbalanced diets or consumption of fast or processed foods,) and environmental factors such as contaminated drinking water, poor sanitation, and frequent contact with agricultural chemicals in rural communities such as contaminated drinking water, poor sanitation, and frequent contact with agricultural chemicals in rural communities**,** and lower parental awareness

This was matched with **Zhou, Xu and Zhou,(2023)** who conducted study about "**Factors influencing the healthcare transition in Chinese adolescents with inflammatory bowel disease: a multi-perspective qualitative study"** they revealed that Parental education level can influence how well adolescents with inflammatory bowel disease (IBD) manage their condition. Higher levels of parental education may correlate with increased knowledge about IBD, improved self-care, and better health outcomes for adolescents. The educational level and work demands of parents influence the transition. Parents with limited education may struggle to understand the disease, which can push patients to take more responsibility for their condition. Conversely, more educated parents tend to be more involved in managing their children's disease.

Concerning sex of adolescents with IBD more than half of the studied adolescents were male with meaning age more than fifteen years .These findings are in agreement with result of **Silva etal ., (2020)** in the study about "Quality of Life in Children and Adolescents with Inflammatory Bowel Disease: Impact and Predictive Factors" he reported nearly the same result .

Ibrahim, Mohamed and Allam, (2024) in the study about the effect of educational program on quality of life and health promoting lifestyle behaviors for adolescents with inflammatory bowel disease reported that the majority of adolescents had secondary school. This matched with the present study that revealed that two thirds of the studied adolescents were at secondary school.

Moreover, the findings of the present study revealed that the majority of the relative did not have inflammatory bowel disease and this was in the same line with the study carried out by **Mohamed et al. ,(2022)** who found that most of participants lacked a family history of the IBD. This could be explained by the fact that IBD is largely a multifactorial condition, shaped by a combination of genetic, environmental, and lifestyle factors rather than heredity alone.

As regard to the impact of intervention programs on self-efficacy among adolescents with IBD, the current study highlighted the program's effectiveness as it shows that the total mean score of self-efficacy was 125.90±28.10 in pre implementation program while it was 179.32±28.12, 173.80±26.12 in post and follow up phase respectively and This was in the same line with **Sheehan etal., (2023)** who concluded that adolescents with IBD report low self-efficacy in managing stress and emotions and in managing symptoms and disease, relative to other IBD self-management domains (i.e., managing medical care or maintaining remission) This high light the need for interventions that specifically foster self-efficacy in managing IBD symptoms and the disease overall.

The present study showed that before the implementation program, adolescents with IBD had only moderate confidence in managing stress, medical care, symptoms, and maintaining remission. However, after the program, their confidence improved to a high level. And this was matched with **Ahmed etal ., (2022)** who revealed that at pre intervention program there was fair self-efficacy but after the post

implementation program the majority of adolescents had high self-efficacy. It can be explained by the fact that structured educational and supportive interventions provide knowledge, coping strategies, and practical skills that empower adolescents to manage their condition more effectively. As **Bandura's theory (1977)** who suggested, that enhancing self-efficacy reduces stress and anxiety, builds confidence in handling challenges, and ultimately improves adherence and health outcomes**.**

The current study demonstrated a highly significant statistical improvement in the overall self-care scores among adolescents with IBD following the intervention program. These findings are consistent with those of **Manzari et al., (2024),** who reported that the education program was effective in improving self-care.

Dietary behaviors

The severity of IBD related symptoms as well as the disease progression are affected greatly by dietary habits and balance, as patients could be less watchful of their diet (**Elhosseiny et al., 2019).** In relation to dietary behaviors and believes of the studied adolescents the present study revealed that there was highly statistically significant difference **(P<0.001)** in post implementation program and follow up phase .This was similar to the study conducted by **Moitra etal., (2021) who** concluded that there was improvement of dietary behaviors after educational program among studied IBD's adolescents. This means that nutritional education and disease knowledge programs are actually desirable to avoid inappropriate and potentially harmful dietetic behaviors.

Concerning the impact of the intervention program on dietary behaviors and beliefs, the study showed a highly significant statistical improvement following its implementation. These findings align with **Godala et al., (2023),** who emphasized that patient education plays a vital role in the effective management and control of IBD. Nutritional practices among adolescents with IBD should not be guided solely by personal beliefs, as these often lack scientific support. Therefore, providing accurate dietary education and promoting evidence-based knowledge is essential for proper disease management.

Regarding to the dietary behaviors of adolescents with IBD, the present study revealed that avoiding specific food such as spicy and fatty items prevent symptoms like abdominal pain, diarrhea, relapse, and fatigue. This finding is consistent with **Bramuzzo et al., (2022),** who noted that symptoms including abdominal pain, diarrhea, bloating, urgency, nausea, vomiting, and fatigue were often worsened by consuming particular food groups, especially spicy or fatty foods.

Also Murtagh etal.,(2023) revealed that avoided certain foods as spicy ,fatty decreased of relapse or flare up and referred to importance of education for IBD patients and this was matched with the present study .

As for ,the importance of medication, nutrition& food supplements the present study revealed that half of the studied IBD adolescents believed that nutrition is more important than medication at post implementation phase of the program, and a little more than one-third considered medication and nutrition are equally important. Additionally almost all the studied adolescents considered the importance of food supplements in improving health and used it, and this was matched with **De Vries etal., (2019)** who found that majority of the studied adolescents valued nutrition to be either more or equally important compared to medication for their treatment and the majority also believed diet to be more important in disease symptoms through dietary adaptations. Dietary supplements were used by the majority of the IBD adolescents who considered diet to be a more important and successful managing tool than medication to relieve their disease symptoms.

Conclusion

The educational intervention had a notable positive effect on adolescents with IBD, boosting self-efficacy, improving self-care behaviors, and encouraging healthier nutritional practices.

Recommendation

- Implement educational intervention programs as a routine part of care for adolescents with IBD in pediatric gastroenterology clinics.
- Provide continuous education and counseling sessions for patients and families to reinforce disease

knowledge and coping strategies.

 Develop simple educational materials (handouts, digital resources, self-monitoring tools) tailored to to meet adolescents' needs and support their disease self-management.

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