

Lifestyle Modification on Symptoms Reduction and Quality of Life Improvement among Adults with Irritable Bowel Syndrome

Asmaa Elsayed Farid Amr⁽¹⁾, Sabah Ramadan Hussein⁽²⁾, & Afaf Mohammed Mansour Gad⁽³⁾

(1) Lecturer of Family and Community Health Nursing, Faculty of Nursing, Menoufia University

(2) Assistant professor of maternity and newborn health Nursing, faculty of nursing, Helwan University

(3) Lecturer of Medical & Surgical Nursing, Faculty of Nursing, Menoufia University

Abstract

Background: Irritable bowel syndrome is a common functional diseases of the gastrointestinal tract that require more attention. Lifestyle modification intervention is an important strategy to improve health, symptoms and quality of life of IBS patients. **Aim** of the study was to examine effect of lifestyle modification on symptoms reduction and quality of life improvement among adults with irritable bowel syndrome. **Methods: Research design:** A quasi experimental design (pre-posttest) was used to conduct the present study. **Setting:** This study was conducted in internal medicine outpatient clinic at University Hospital in Menoufia governorate, Egypt. **Subjects:** A purposive sample of 75 adults were recruited in this study. **Tools:** (1) An interviewing questionnaire consisted of three parts; I- Adults' socio- demographic data II- Adults' clinical data. III- Adults' knowledge questionnaire about IBS (2) IBS- Severity Symptom Scale. (3) IBS-QOL questionnaire. **Results:** After implementation of lifestyle intervention, the total mean score of knowledge was improved from 43.90 ± 10.57 to 79.69 ± 7.27 and the total mean score of IBS- symptoms were reduced from 223.56 ± 65.50 to 151.93 ± 79.55 . Also, there was a highly statistical significant improvement in total IBS- quality of life score among study sample at ($p < 0.001$). **Conclusions:** Lifestyle modification intervention for three months had a positive effect and significantly reduce IBS symptoms, enhance knowledge and succeeded in improving quality of life among adults with irritable bowel syndrome. **Recommendation:** Continuous patients' education about IBS disease should be planned regularly in outpatient clinic to control the disease symptoms and reduce its unwanted effect on quality of life.

Keywords: Lifestyle modification, Symptoms reduction, Quality of life, Irritable Bowel Syndrome

Introduction

Irritable bowel syndrome (IBS) is a common functional gastrointestinal disorder characterized by recurrent abdominal pain associated with changes in stool frequency and form,. This syndrome is a major health problem globally (Björkman et al., 2019). The most popular second cause of absent from work after the common flu. The prevalence of IBS varies greatly with 1 to 45% most likely due to different diagnostic criteria applied with an average worldwide prevalence of 11.2%, as well as reflecting the prevalence in western countries with 10–20% (Oka et al., 2020).

The prevalence of irritable bowel syndrome reported internationally, the Rome Criteria IV IBS prevalence was 4.6% in the whole study sample. The rate was prevalence of IBS was 4.5% in Canada, and 4.7% in the United States. The Rome III IBS rate was approximately prevalence as high as the Rome IV rate: It was 8.6% in the United States and 9.5% in Canada. The occurrence was higher in

women than in men with a ratio of 2:1, and the climax of the syndrome often began in early adulthood (Bazzi, Bazzi, & Hallal., 2021).

In Egypt, it found that the recurrence rate of IBS was 31.7% with a higher prevalence among women and among clients who had family history of IBS (Elhosseiny et al., 2019). In Saudi Arabia, prevalence of IBS was 31.8% based on the study conducted on medical students in Jeddah reported (Central Agency for Public Mobilization and Statistics, 2019).

The pathogenesis of IBS has multiple factors, such as gene influence, food intolerance, changes in gastrointestinal (GI) bacteria, activation of intestinal immunity, increased bowel permeability and hypersensitivity, and alteration in the neuroendocrine system of the bowel. The most important step to make a positive diagnosis of IBS is the change in stool characteristics and frequency of defecation, so these changes allowed IBS to be categorized into subcategories based on the pattern of stool.

They are dominant diarrhea (IBS-D), dominant constipation (IBS-C), or fluctuation between diarrhea and constipation which classify mix (IBS-M) (Countts, 2019). The diagnosis of IBS is based on various diagnostic criteria as Manning and Rome criteria according to the Rome Foundation criteria. There are four diverse versions Rome I, II, III and IV. The Rome criteria is intended to classify functional gastrointestinal disorders that depend on symptoms for diagnosis. (Sierżantowicz, Lewko, & Jurkowska., 2020).

Rome criteria I means general symptoms of IBS as abdominal pain, bloating, diarrhea, constipation, Sensation of incomplete evacuation >25% of the time. Rome criteria II refers to that the patient must have abdominal discomfort or pain which need not be consecutive in the last 12 months (Uday et al., 2013). Rome criteria III refers to the recurrent abdominal pain about three days per month in the previous three months. The criteria are completed with symptoms onset six months prior to diagnosis. While Rome criteria IV means the patients have complained from recurrent abdominal discomfort on the average at least 1 day/week during the previous three months. All classification of IBS Rome Criteria should associated with at least 2 or more of general symptoms (Black et al., 2021).

Irritable bowel syndrome can undesirably affect on quality of life which can lead to interruptions in day life or work life. Related disorders occurred are depression, anxiety, and chronic fatigue syndrome. Also, there are different IBS symptoms occur as pain, cramps in the stomach, a noticeable change in the pattern of bowel movements, such as diarrhea, constipation, frequently experiencing the urge to go to the toilet, bloating of stomach, mucous in the stool, excessive accumulation of gas, and an uncomfortable feeling of completely bowel emptied after coming from the toilet. If the condition is left untreated, it may exhibit more severe symptoms similar to colon cancer. In addition, the serious IBS symptoms include frequent diarrhea, weight loss, rectal bleeding, difficulty swallowing, iron deficiency anemia, excessive vomiting and persistent pain while gas or bowel movement (Alsuwailm et al., 2017).

The quality of life (QOL) for patients suffering from IBS is significantly affected physically, psychologically, and economically. Many cases reported difficulties in concentration, decreased in energy level, and lower self-esteem. In addition, many cases become socially embarrassed due to unpredictable bowel habits. This condition treated by using a combination of pharmacological and non-pharmacological management (Torkzadeh et al., 2019).

Lifestyle modifications is considered a non-pharmacological management include probiotics in the regular diet, soluble fiber rich food, smaller meals and eat at the same time daily, good hydration from three to four liters, chewing food slowly for proper digestion, avoid alcohol, caffeine, and tobacco, keep a food diary. It also include stress management as meditation, indulging in hobbies and talking with family/friend, regular physical exercise about one hour/day, one hour gap between meal and sleep, good 7-8 hours of sleep. Lifestyle modifications play an important role in the management of irritable bowel syndrome that can alleviate the symptoms of IBS, the underlying factors, and relieve the tension, anxiety that may frequently induced by this disorder. It also improve quality of life, increase concentration, increase energy level, higher self-esteem, less fatigue, better sleeping patterns, and increased endurance (Russell et al., 2018).

Nurses play a major role in the care of the patient with IBS. Nurses deal frequently with patients and try to maintain high quality of care, alleviate suffering and decrease symptoms of IBS. Nurses are in the most immediate position to provide care, comfort and counseling for patients, families and encourage the patient to carry out lifestyle modifications. Successful management for patients can help maintain effective physical/social wellbeing, and reduce emotional distress of patients (Sierżantowicz, Lewko, & Jurkowska., 2020).

Significance of the Study

Irritable bowel syndrome is one of the most common chronic disorders of the digestive system and a group of intestinal disorder that occur together. Symptoms may

occur over a long time, even years. The symptoms vary in severity and duration from person to person. Recent statistics show 10-15% of world population is suffering from IBS (Torkzadeh et al., 2019).

The most frequently reported symptoms that impact quality of life in individuals complain from IBS are abdominal pain, bloating, limitations in eating/diet restrictions, bowel difficulties, and constipation-predominant IBS and also diarrhea-predominant IBS. For example, more than 50% of individuals with IBS are forced to stay close to a toilet, about 69% are distressed by symptoms, 57% of them experienced lack of control over their lives, and are emotionally disturbed (upset, depressed, less confident, or worried). The degree of interruption of daily life is also related to coexisting or co-occurring conditions such as depression and anxiety (Qura et al., 2018).

Therefore lifestyle modifications is one of the most important intervention for the patients with irritable bowel syndrome that required to reduce IBS symptoms of and improve quality of life. The nurses encourage the patients to follow health education and make life style changes which have an important role in achieving better patient outcomes by improving daily living activities, and quality of life (Russell et al 2018). Thus the purpose of the current study was to examine effect of lifestyle modification on symptoms reduction and quality of life improvement among adult with irritable bowel syndrome.

Aim of the study

The present study aimed to examine effect of lifestyle modification on symptoms reduction and quality of life improvement among adults with irritable bowel syndrome

Research Hypothesis

H1: Adults' knowledge scores regarding irritable bowel syndrome will be improved post lifestyle modification implementation compared with their pre- implementation scores.

H2: Symptoms severity level among the studied adults will decrease post intervention compared to their pre-intervention.

H3: Adults' quality of life scores will be improved post intervention compared to their pre-intervention.

Operational definition:

Lifestyle modification: refers to non-pharmacological management including, dietary modification, weight reduction, physical exercise, smoking cessation and stress management to reduce symptom and improve quality of life.

Quality of life is defined as a measure of the individual's ability to function either physically, socially and emotionally within his/her environment at a level that consistent with his/her expectations. It is measured through using IBS-QOL questionnaire to determine quality of life among adults with IBS.

Irritable bowel syndrome is a group of symptoms that occur together, including repeated pain in abdomen, changes in bowel movements as diarrhea, constipation, or both, abdominal bloating, and stomach pain or cramps. It is measured by using IBS- severity symptom scale (IBS-SSS) to identify the severity of IBS symptoms.

Adult: It is the period of the lifespan between adolescent and old age. This period lasts from 18 to 64 years depending on stages, ages, and tasks are defined (Erçetin, Açıkalın& Güngör, 2016).

Subjects and methods:

Research design:

A quasi experimental design (pre-posttest) was used to conduct the present study.

Setting:

This study was conducted in internal medicine outpatient clinic at University Hospital in Menoufia governorate, Egypt.

Subjects

A purposive sample of 75 adults were recruited in this study according to the following:

Inclusion criteria:

- Adults were both sex, and aged 18 - 64 years
- Adults, who had diagnosed with Rome

Criteria IV of irritable bowel syndrome. Rome Criteria IV refers to symptoms had occurred once a week in the past three months. These symptoms included recurrent abdominal pain at least three days/month or once/ a week in the last three months which associated with two or more of the following: improvement with defecation, change in the form of the stool, and, change in the stool frequency. Adults should complain from the symptoms of IBS at least six months pervious to diagnosis.

Exclusion criteria:

- Age less than 18 years or more than 64 years
- Adults not diagnosed with Rome Criteria IV.
- Adults who diagnosed with any of the following disease: Crohn's, peptic ulcer, ulcerative colitis, colon cancer and diverticulitis and colon cancer.

Sample size:

A total of (75) adults diagnosed with IBS (Rome Criteria IV) were selected according to the following formula:

$$n' = \frac{n}{1 + \frac{z^2 \times \hat{p}(1-\hat{p})}{\epsilon^2 N}}$$

Where z refers to the z score which is the margin of error. N refers to population size and \hat{p} is the population proportion

Tools for data collection:

Three instruments were used to collect the data for this study. It included:

Instrument I: Structured interviewing questionnaire was developed by the researchers. It involved three parts:

Part I: Adults' socio- demographic data. It included five questions as age, gender, marital status, level of education, and occupation.

Part II: Adults' clinical data. It consisted of three questions as smoking habit, IBS complain, and duration of illness.

Part III: Adults' knowledge questionnaire about IBS. It comprised of fifty three closed questions as definition of IBS,

causes, signs and symptoms, complication,.....etc.

Each correct answer was given 1 score and incorrect answer was given zero score. The total score ranged between 0-53 score and categorized according to the following knowledge scoring system (Khan et al., 2019).

Knowledge scoring system

Item	Score	percentage
Un satisfactory	1-31	<60%
Satisfactory	32-53	≥60%

Validity and reliability

Instrument were tested for its content validity by a jury of five experts in medical surgical nursing and community health nursing to reach the agreement of the best form of questionnaire to be implemented. The required modifications were completed according to their judgment on the clarity of the sentences and the appropriateness of content. Reliability of this instrument (Part III: Adults' knowledge questionnaire about IBS) was performed by researchers to test its internal consistency using test re test reliability by administration of the same questionnaire to the same subjects under same conditions on more occasions. The repeated testing answers were compared and confirmed to be strongly reliable ($r = 0.93$).

Instrument II: IBS- Severity Symptom Scale (IBS-SSS): This instrument was adopted from (Piegel, et al.,2010). It was used to identify the severity of IBS symptoms. This instrument comprised of five questions which rated using Visual Analogue Scale in order to estimate the following: pain intensity, pain frequency, severity of flatulence, satisfaction with the defecation, and the effect of IBS on quality of life. The minimum and the maximum scores were ranged from 0 -500. the severe symptoms were presented by higher scores. The scores were classified into 3 parts according to the obtained data as the following: mild symptoms ranged from (75-175), moderate symptoms ranged from (176-300) and, sever symptoms ranged from (301-500). This instrument was tested for its validity and reliability by (Simrén, 2010). A content validity ratio was considered for each item and test re test reliability was used and confirmed to be strongly reliable ($r = 0.81$).

Instrument III: IBS-QOL questionnaire: it was used to determine quality of life among adults with IBS. it was adopted from (David et al., 2013). It consisted of thirty four items which ranging from “Not at all” to “A lot” or “Extremely” with five choice of Likert-type response items. this questionnaire consisted of eight subscales as the following: dysphoria (8 items), body image (4 items), health worry (3 items), interference with activity (7 items), food avoidance (3 items), social reaction (4 items), sexual issues (2 items) and relationships (3 items). This instrument were translated into Arabic to be suitable for participants' language. Scores of the questionnaire that obtained were transformed as a percentage on IBS- QOL scale from 0 to 100 points. Higher scores mean that HR-QOL is good functioning while lower score mean that HR-QOL is poor functioning. IBS-QOL questionnaire was tested for its validity and reliability by (Eunhyun, 2016) using test retest reliability. This instrument confirmed high internal consistency (Cronbach's $\alpha = 0.95$) and demonstrate to be reliable ($r = 0.86$).

Methods of data collection

Ethical considerations and the human rights:

Ethical committee approval on the research topic was gained from the Faculty of Nursing, Menoufia University. Also, the formal consent of the participants was taken to participate in the present study after providing explanation of study purpose. The adults were assured the obtained information would be confidential. Also, they informed that participation in this study was voluntary and they had right to withdraw at any time from the study.

Pilot study

The research tools was applied on 10% of the total selected sample to assess its feasibility, clarity and to identify the required time needed to answer the questionnaire. Based on pilot study results, the needed rephrasing of some questions was done prior to data collection. Exclusion of pilot sample from total sample were done to ensure strength of the results.

Procedure of data Collection:

- Official permission was taken by the researchers from University Hospital director, Menoufia governorate, Egypt. Explanation of the agreements and the purpose of the study were provided to physicians and nurses in the internal medicine outpatient clinic of university hospital in order to gain their cooperation.
- The researchers collected the needed data from the first of April 2021 to the first of October 2021.
- An exploratory visit to internal medicine outpatient clinic was made by the researchers to estimate frequency rate of adults patient with IBS and determine the appropriate time for data collection. During the visit, the researchers made personal communication with the physician and the nurse about the nature of the current research and in order to gain their cooperation.
- After explaining of the study purpose and nature then the researchers obtain their approval to conduct the research, adults who met the study criteria were involved in the study.
- The researchers introduced themselves to the adults with IBs through face to face interview and explained purpose of the study using subjects' language and their formal consent to participate was obtained with the help of internal medicine outpatient clinic nurse.
- After that, a copy of pretest questionnaire was distributed to be filled by the subjects. It took about 20-30 minutes.
- The physician and the nurse of internal medicine outpatient clinic were asked to determine two days a week in order to provide intervention to the studied adults.
- The researchers interviewed about 7-8 adults with Rome criteria IV irritable bowel syndrome per week with the range 3-4 adults/ day twice a week in the morning shift. The time was determined according to subjects attendance to the outpatient clinics and the cooperation between researchers and internal medicine outpatient clinic's

nurse.

- After filling of pretest, the researchers began to explain life style modification module sessions.
- Life style modification (LSM) instructional module was established based on a revision of related literature and also, according to the clients' educational needs.
- The researchers explained LSM instructional module in two session.

First session: it included providing the studied adults general knowledge about IBS as definition of IBS, causes, signs and symptoms, risk factors and complication of IBS.

Second session: it included knowledge about LSM which include adequate diet for IBS, physical exercise, smoking cession, and methods of preventing stressors and relaxation technique, as well as adherence to drug therapy and follow-up care.

- Lifestyle modification module sessions were offered on the basis of the specific needs and level of understanding through using of different teaching methods as lectures, discussions, demonstration, re demonstration, and brainstorming, as well as giving examples modeling
- Each session lasted approximately 35-45 minutes. after the session completed, a summary, feedback, and further clarifications were done for missing items. Before starting the new session, adults were asked questions relevant to the items explained in the previous session in order to ensure that they understood and remembered the instructions were given; missing or ambiguous points were repeated and re-emphasized by the researcher.
- After finishing of providing sessions and the researchers ensured that all points were understood by the subjects. The researcher confirmed on the importance of adherence to lifestyle modification module to decrease IBS symptoms and improve their quality of life. Then, A copy of the instructional booklet supported by pictures, examples and presented in an Arabic language was given to adults to be a reference to them.

- Coordination with the patients to follow up when they go to outpatient clinics. Also followed them by the phone.
- The researchers followed up the studied adults at one time /month and also at any time if needed by telephone to assess their compliance to life style modification module. After 3 months of applying LSM module, the researchers coordinated with the subjects by phone when they go to internal medicine outpatient clinic in order to meet them and report their improvement in IBS symptoms and quality of life . Also, the researchers evaluated the effect of lifestyle modification module on IBS symptoms and quality of life through filling posttest questionnaire. It took about 20-30 minutes.

Statistical analysis:

The obtained data were coded and tabulated using SPSS version 20. Descriptive analysis of data was carried out using frequencies, percentages, means, and standard deviations. Chi- square and Wilcoxon ranks test were used for comparison between two qualitative variables but paired t- test was used for comparison between two quantitative variables . For assessment of the correlation between variables Pearson correlation(r) was used. P-value is significant if ≤ 0.05 .

Results

Table (1) shows socio demographic and clinical data of the studied adults with IBS. Regarding socio demographic data, it demonstrates that the highest percentages of IBS were among age group between 30-40 years (50.7%), female (69.3%), married (80.0%) ,adults who had diplom education (34.7%) and also highest percentages of IBS were among not workers (58.7%). Regarding clinical data, it shows that 69.3% of studied adults reported family history for IBS, 74.7% of studied adults had duration of illness less than five years. Also, it presents that 49.3% of them had constipation as IBS complain and 73.3 % were nonsmoker.

Table (2) presents that the total mean score of knowledge about IBS among the studied sample in pretest was 43.90 ± 10.57 and improved to be 79.69 ± 7.27 in the posttest.

Also, there is a highly statistical significant differences among the studied adults regarding pre/ posttest of total mean score of knowledge as ($P < 0.001$).

Table (3) represents effect of lifestyle modification intervention pre- posttest on Symptoms Severity Scale of IBS among the studied adults. It illustrates that there is statically improvement of symptoms after intervention than pre intervention as severe symptoms decreased from 21.3% to 12.0%, moderate symptoms decreased from 58.7 % to 34.7% while mild symptoms increased from 20% to 53.3%. Also, it shows a statistical significant improvement in the total mean score of symptoms among studied adults post intervention as 223.56 ± 65.50 decreased to 151.93 ± 79.55 and $P < 0.001$.

Table (4) represents effect of lifestyle modification intervention pre- posttest on IBS-QOL domains among the studied adults. It illustrates that a statistical significant differences were found among studied sample in all quality of life domains pre and post intervention. It reveals that mean scores of IBS-QOL domains were increased post

intervention compared to pre intervention at $p < 0.001$.

Figure shows that unsatisfactory level of knowledge before intervention was 93.3% while in post intervention, it decreased to 13.3%. Also, it presents that satisfactory level of knowledge was 6.7% in pre intervention while it improved to 86.7% post intervention.

Figure 2 presents that total mean score of IBS-QOL in pre intervention was 52.3 while in pre intervention total mean score of IBS-QOL scale was 81.4. There was a statistical significant improvement in total mean score of IBS-QOL scale post intervention compared to pre intervention at $p < 0.001$.

Table (5) represents correlation between knowledge of the studied adults about IBS and symptom severity scale and also IBS- QOL (pretest & posttest). It shows that after receiving knowledge about IBS, there is decreasing in SSS among adults from -0.286 to - 0.221 also, a significant negative correlation occur between knowledge level and IBS-SSS in pre and post intervention ($p < 0.001$). Also, there is positive significant correlation between knowledge level and IBS-QOL in pre and post intervention ($p < 0.001$).

Table (1): Distribution of socio demographic and clinical data among the studied adults with IBS (n=75).

Demographic data	The study group (n=75)	
	No	%
•Age (years):		
18-	4	5.3
30-	38	50.7
40-	24	32.0
50-	7	9.3
60-64	2	2.7
Mean \pm SD	37.98 \pm 8.17	
•Gender:		
Males	23	30.7
Females	52	69.3
•Marital status:		
Single	3	4.0
Married	60	80.0
Divorced	3	4.0
Widowed	9	12.0
•Educational level:		
Illiterate	18	24.0
Basic	19	25.3
Diplom	26	34.7
Highly educated	12	16.0
•Occupation:		

Demographic data	The study group (n=75)	
	No	%
Worker	31	41.3
Not worker	44	58.7
Clinical data		
Family history		
Yes	52	69.3
No	23	30.7
Duration of disease		
Less than five years	56	74.7
More than five	19	25.3
IBS complain		
Diarrhea	20	26.7
Constipation	37	49.3
Mixed	18	24.0
Smoking		
Smoker	20	26.7
Non-smoker	55	73.3

Table (2): pre/ posttest total mean scores of knowledge about irritable bowel syndrome among the studied adults (n=75).

	The studied adults (n=75)		t- test	P
	Pretest	Posttest		
	Mean \pm SD	Mean \pm SD		
Total knowledge score:	43.90 \pm 10.57	79.69 \pm 7.27	25.14	0.000*

Test of significance: paired t-test

* Highly significance: $P < 0.001$

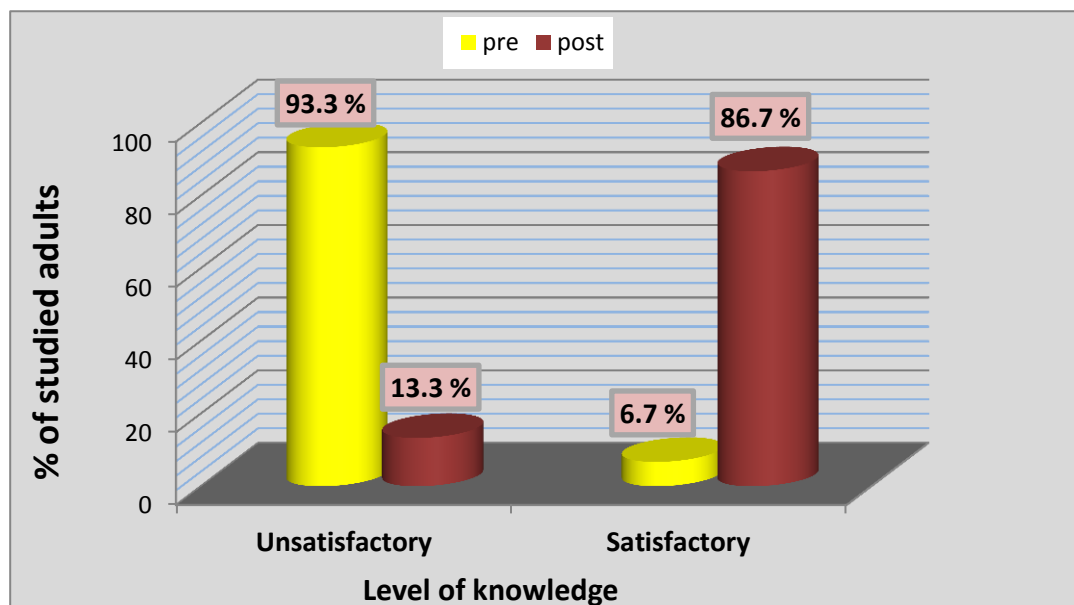


Figure (1): Effect of lifestyle modification intervention pre- posttest on the level of knowledge regarding irritable bowel syndrome among the studied adults.

Table (3): Effect of lifestyle modification intervention pre- posttest on Symptoms Severity Scale of IBS among the studied adults (n=75).

Symptom severity scale	The studied adults (n=75)				χ^2 P
	Pretest		Post-test		
	No	%	No.	%	
Mild (75–175)	15	20.0	40	53.3	54.44 0.000**
Moderate (176–300)	44	58.7	26	34.7	
Severe (301–500)	16	21.3	9	12.0	
Mean ±SD	223.56 ±65.50		151.93 ±79.55		Z: 7.203 0.000**

 χ^2 chi square test

Z: Wilcoxon test

* Highly significance: P<0.001

Table (4): Effect of lifestyle modification intervention pre- posttest on IBS-QOL domains among the studied adults (n=75)

IBS-QOL domains	The studied adults (n=75)		Paired t-test	P
	Pre	Post		
	Mean \pm SD	Mean \pm SD		
Dysphoria	46.02 \pm 5.9	72.81 \pm 6.1	26.302	<0.001**
Body image	50.52 \pm 8.8	76.52 \pm 7.7	21.804	<0.001**
Health worry	48.40 \pm 8.9	78.3 \pm 7.5	29.718	<0.001**
Interference with activity	49.37 \pm 9.0	66.92 \pm 10.9	9.985	<0.001**
Food avoidance	44.21 \pm 6.3	75.32 \pm 10.8	20.930	<0.001**
Sexual concerns	61.64 \pm 14.6	78.85 \pm 7.7	7.439	<0.001**
Social reaction	51.45 \pm 10.0	77.89 \pm 7.9	17.309	<0.001**
Interpersonal relationship	58.86 \pm 14.9	80.73 \pm 7.9	10.291	<0.001**

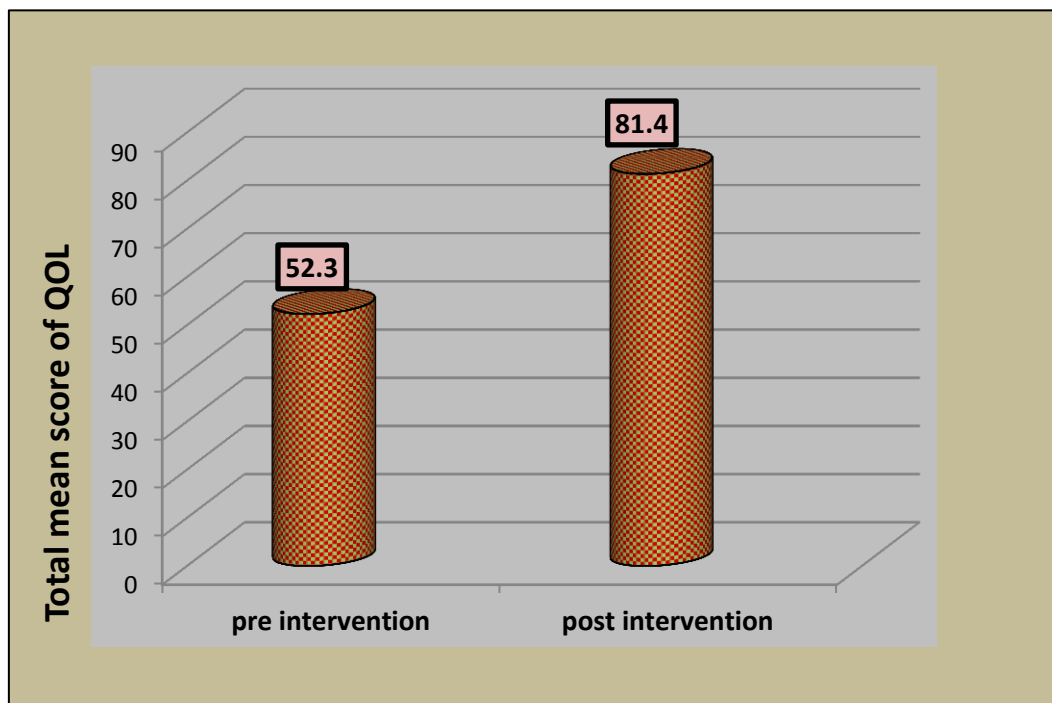
**Figure (2):** Effect of lifestyle modification intervention pre- posttest on total mean score IBS-QOL scale among the studied adults (n=75)

Table (5): Correlation between pre-posttest knowledge level of the studied adults regarding irritable bowel syndrome and symptoms severity score and their QOL score (N=75)

level of burden & coping	Knowledge about IBS (n=75)			
	Pretest (n=90)		posttest (n=90)	
	r	P	r	P
▪ IBS-SSS	- 0.286	0.013*	- 0.221	0.001**
▪ IBS-QOL	0.380	0.001**	0.366	0.001**

r: Pearson Correlation

*Significance at p value < 0.05

Discussion

Irritable bowel syndrome (IBS) is a common gastrointestinal disorder that cause disability and affect quality of life in people who have the disease than the other population. Additionally, it causes economic burden on communities and places heavy burden on health care system all over the world (Bradley et al., 2018). People with IBS have little knowledge about the disease and its concerns. So, nurses have the vital role in providing more attention to people with IBS through increase their knowledge about the disease and help them to follow healthy lifestyle modification (Patel & Shackelford., 2020).

Regarding socio demographic data of the studied sample with IBS. The current study revealed that highest percentages of IBS were among age group between from thirty to thirty nine years followed by forty to forty nine years with the mean age group 37.98 ± 8.17 , and also among female, married, adults who had diplom education and among not working adults. The result was in similarity with Ibrahim ,2016 who reported that prevalence of IBS was high among age group thirty to fifty years, and among female than male. Also, the results was in agreement with study done by Qora et al., 2018. They stated that prevalence of IBS occur among female, mean age group 36.18 ± 10.15 , married, patient had intermediate institute. Also. It was high among patient hadn't work. These agreement of result due to that female are exposed to stressful situation in raising up their children than men, married adults also always exposed to psychological and nervous pressure in performing their responsibilities than other marital status.

Concerning family history of studied adults, the present study indicated that nearly two third of studied adults reported family history for IBS. These finding is consistent with study done by Abd Elaziz et al., 2019. They reported that half of studied patient had a family history of IBS. Also, the results was consistent with Alsuwailm et al., 2017 who stated that IBS was higher among studied students who had a positive family history of IBS. These similarity due to several genes in the body may interact with each other and the environment to cause IBS to happen over time.

The results of the current study indicated that nearly one half of the sample had constipation as IBS complain and nearly three quarters of studied adults were nonsmoker. These finding was disagree with Addante et al., 2019. They reported that fifty percent of the sample have diarrhea prodromal This disagreement may be due to difference in culture or diagnosis of IBS criteria that made constipation prodromal. Also, they reported that IBS is common among smoker patient than nonsmoker . The disagreement might be due to most of the sample was female and subjected to negative smoking which is more serious than positive smoking that increase IBS among studied sample of the current study.

Effect of lifestyle modification intervention on the studied adults' knowledge regarding irritable bowel syndrome.

The present study hypothesized that Adults' knowledge scores regarding irritable bowel syndrome will be improved post lifestyle modification implementation compared with their pre- implementation scores. The current study revealed that satisfactory level of knowledge was 6.7% before intervention while

it increased to 86.7% post intervention. Also, the findings reported that mean knowledge score was 43.90 ± 10.57 in pretest while in posttest was improved to 79.69 ± 7.27 . This indicated a statistical significant improvement in total mean score of knowledge among the studied adults after intervention as ($P < 0.001$). These findings was in similarities with **Ghareeb, Abouelala, & Elesawy., 2020**. They reported that studied patients had insufficient level of knowledge about IBS before implementation of instructional module. While after implementation of intervention, the patient had more sufficient knowledge about IBS. Also they indicated that total mean knowledge score had improved from 34.07 ± 13 . to 77.0 ± 19.6 after 3 month of implementing intervention.

Also, The finding was in agree with previous study done by **Björkman, et al., 2019**. They indicated that there was a statistical significant increase in knowledge level of IBS patients after 12-weeks follow-up period of educational module implementation compared with pre-education.

This result was also in similarity with **Vo Duy, Nguyen, & Bui., 2020**. They confirmed that accurate description were given to IBS patients on their condition as lifestyle modification as diet, exercise guidelines, stress management instructions, emotional support and also options for treatment. After three months of educational intervention, there was decrease in misconceptions about IBS condition compared with before the intervention. This similarity in findings might be due to deficiency of educational services, the inaccessibility to information sources on IBS disease and its effects in outpatient clinics as doctor prescribed medication not providing education. So, the results of this study indicated that the effect of lifestyle modification intervention on improving the adults' knowledge level about IBS.

Effect of lifestyle modification intervention on IBS-Symptoms Severity Scale among the studied adults

The current study hypothesized that symptoms severity level among the studied adults will decrease post intervention compared with pre-intervention. The present study

displayed a statistical significant improvement of symptoms after intervention than pre intervention as more than half of the sample had mild symptoms, one third of them had moderate symptoms while only one tenth had severe symptoms. Also, the result findings revealed a significant improvement in the total mean symptoms score among studied sample as pre intervention was 213.95 ± 77.52 while decreased to 164.44 ± 75.08 in post intervention as $P < 0.001$. The study findings are similar to **Ghareeb, Abouelala, & Elesawy., 2020** and the study done by **Addante et al., 2019**. who reported that there was a significant decreasing in studied sample' symptoms severity (SSS) of IBS after educational intervention. Also, the mean IBS-SSS score decreased after educational module implementation compared with the pre- implementation. Also, the study findings are in different with **Bazzi, Bazzi, & Hallal, 2021** who confirmed that more than half of the study participants reported no improvement of their IBS symptoms after using symbiotic treatment compared with pre intervention. The disagreement may be due to that the adults in may study have the interest to acquire knowledge and practice significant strategies to overcome IBS- symptoms.

Effect of lifestyle modification intervention on IBS-quality of life among the studied adults

The present study hypothesized that adults' quality of life scores will be improved post intervention compared with their pre-intervention. The findings of this study revealed that total mean IBS-QOL score was 52.3 ± 9.5 of in pre intervention while in post intervention was 81.42 ± 8.0 . Also, there was a statistical significant improvement in all QOL-domains mean scores and total mean score post intervention compared with pre intervention ($p < 0.001$). The study findings are in accordance with **Vo Duy, Nguyen, and Bui, 2020** who reported that a significant improvement in the patients, total quality of life score as mean score was 51.6 ± 6.0 pre-implementation of intervention while the mean score was 76.1 ± 11.5 in post intervention. This finding is in context with **Ghiyasvandian et al., 2016** who reported that self-care program application lead to quality of life improvement and symptom reduction after application of the intervention among study group than control

group. In addition, the results is consistent with **Camilleri, 2018** who concluded after educational intervention implementation, the IBS-QOL was significantly improved than pre implementation. The similarities in results may be due to motivational factors reflection among studied sample and the positive effect of lifestyle modification intervention.

The findings is in difference with **Ringström et al., 2015** who stated that the use of a brochure including pictures and written information or providing IBS- educational sessions with patients did not improve the QOL of those patients. The disagreement may be related to differences sample characteristics or motivational factors used to encourage engaging in changing lifestyle behaviors

The study results displayed a negative correlation occur between IBS-knowledge and IBS-SSS in pre, and post intervention while there is positive correlation between IBS-knowledge and IBS-QOL in pre, and post intervention. This findings is in accordance with **Khan et al., 2019** who indicated that a strong negative association between Knowledge, IBS QOL and the severity of IBS symptoms among patient. This similarities may be due to that improving lifestyle modification through knowledge can improve quality of life and reduce symptoms among adults with IBS.

Limitation of the Study

Complete data about IBS- Rome criteria IV is difficult to be obtained as some patients not registered in outpatient clinics and go to specialized medical clinics when feel symptoms.

Conclusion:

In the light of the current study results, it can be concluded that lifestyle modification intervention for three months had a positive effect and significantly reduce IBS symptoms, enhance knowledge and succeeded in improving quality of life among adults with irritable bowel syndrome.

Recommendations:

The following recommendations are suggested:

- Continuous patients' education about IBS disease should be planned regularly in

outpatient clinic to control the disease symptoms and reduce its unwanted effect on quality of life.

- Lifestyle modification intervention is an appropriate model to be implemented for IBS disease and any chronic disease
- Long term studies are needed to be conducted to include all types of IBS with a large sample.

References

- Abd Elaziz, H., Ismail, R., Mohammed, H., & Abd Elaziz, S. Y. (2019):** Psychosocial aspects and personality dimensions among a sample of patients with irritable bowel syndrome. *Egyptian Journal of Psychiatry*, 40(3), 147.
- Addante R. Naliboff B. Shih W. et al.(2019).** Predictors of health-related quality of life in irritable bowel syndrome patients compared with healthy individuals. *J Clin Gastroenterol.* 2019; 53: e142-e149
- Alsuwailm, A., AL-Qahtani, M., AL-Hulaibi, A., AL-Hadi, A., Ali, I., & Shehabeldeen, A. (2017).** Irritable bowel syndrome among medical students and interns in King Faisal University. *Open Journal of Preventive Medicine*, 7(11), 235.
- Bazzi N,Bazzi M, & Hallal H.(2021).** Symbiotic Treatment Improve IBS Symptoms and Quality of Life: Placebo-Controlled Study. *Journal of Gastroenterology & Hepatology*, 5(10), 908-917.
- Björkman, I., Ringström, G., Simrén, M., Myrgren, J., & Ung, E. J. (2019):** An Intervention for Person-Centered Support in Irritable Bowel Syndrome: Development and Pilot Study. *Gastroenterology Nursing*, 42(4), 332-341.
- Black CJ, Craig O, Gracie DJ, et al.(2021).** Comparison of the Rome IV criteria with the Rome III criteria for the diagnosis of irritable bowel syndrome in secondary care *Gut* 2021;70:1110-1116.

- Bradley, S., Alderson, S., Ford, C., & Foy, R. (2018).** General practitioners' perceptions of irritable bowel syndrome: A Q-methodological study. *Family practice*, 35(1), 74-79.
- Camilleri M. (2018).** Management Options for Irritable Bowel Syndrome. *International journal of preventive medicine*. Volume 93, Issue 12, December 2018, Pages 1858-1872. available at <https://doi.org/10.1016/j.mayocp.2018.04.032>
- Central Agency for Public Mobilization and Statistics. Egypt Statistics.** https://www.capmas.gov.eg/Pages/IndicatorsPage.aspx?Ind_id=1125. Accessed 20 Apr 2019.
- Coutts, A. (2019):** Nursing management of irritable bowel syndrome. *Nursing Standard*, 34(5), 76–81.
- David A , Donald L , Douglas A , Paul S .(2013).** Evaluation of the Irritable Bowel Syndrome Quality of Life (IBS-QOL) questionnaire in diarrheal-predominant irritable bowel syndrome patients. *Health Qual Life Outcomes J*. Dec 13;11:208. doi: 10.1186/1477-7525-11-208.
- Elhosseiny, D., Mahmoud, N., & Manzour, A. (2019).** Factors associated with irritable bowel syndrome among medical students at Ain Shams University. *Journal of the Egyptian Public Health Association*, 94(1), 1-9.
- Erçetin A, Açıkalın M& GüngörN, (2016).** A unique classification on adults: “adult-child, adult-adolescence, adult-adult” different perspective on leadership. *Journal of Aging Studies*. 19 (2): 163–183. doi:10.1016/j.jaging.2004.05.002.
- Eunhyun L , Oran K, Ki Baik H, WonHee K, Jin K, Dae Y,et al. (2016).** Irritable bowel syndrome-specific health-related quality of life instrument: development and psychometric evaluation .*Health and Quality of Life Outcomes* volume 14, Article number: 22
- Ghareeb M; Abouelala M & Elesawy M.(2020).** Effect of an Educational Module on Knowledge, Symptoms Severity and Quality of Life in Patients with Irritable Bowel Syndrome. *Assiut Scientific Nursing Journal*. Vol , (8) No, (23) Supplement December, pp (166-175)
- Ghiyasvandian, S., Ghorbani, M., Zakerimoghadam, M., Purfarzad, Z., & Kazemnejad, A. (2016):** The effects of a self-care program on the severity of symptoms and quality of life of patients with irritable bowel syndrome. *Gastroenterology Nursing*, 39(5), 359-365.
- Ibrahim1K..(2016).** A systematic review of the prevalence and risk factors of irritable bowel syndrome among medical students. *Turk J Gastroenterol*; 27: 10-6 6• Available online at www.turkjgastroenterol.org. DOI: 10. 5152/ tjj. 2015.150333
- Khan A , Al Sayegh H, Al Ali M , Al Qurini H , AlKhars H , AlKhars A.(2019).** Assessment of knowledge and related risk factors of irritable bowel syndrome in Alahsa, Saudi Arabia. *International Journal of Medicine in Developing Countries*;3(1):030–035. <https://doi.org/10.24911/IJMDC.51-1543467833>
- Oka, P., Parr, H., Barberio, B., Black, C., Savarino, E., & Ford, A. (2020).** Global prevalence of irritable bowel syndrome according to Rome III or IV criteria: a systematic review and meta-analysis. *The Lancet Gastroenterology & Hepatology*, 5(10), 908-917.
- Patel N, Shackelford K.(2020):** Irritable Bowel Syndrome. [Updated Jul 10]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Available from: <https://www.ncbi.nlm.nih.gov/books/NBK534810/>
- Piegel BM, Bolus R, Agarwal N, Sayuk G, Harris LA, Lucak S, et al. (2010).** Measuring symptoms in the irritable bowel syndrome: development of a framework for clinical trials. *Aliment Pharmacol Ther* 2010;32:1275-91.

- Qora A, EL Kot M, Salama A, & Abd El Rahman M.(2018).** Quality of life in patients with irritable bowel syndrome in Qaliobeya Governorate, Egypt. *Menoufia Medical Journal*, V(31) , Issue (2) Page : 438-442. DOI: 10.4103/1110-2098.239748
- Ringström, G.; Störsrud, S.; Posserud, I.; Lundqvist, S.; Westman, B.; Simrén, M. (2015).** Structured patient education in superior to written information in the management of patients with irritable bowel syndrome-randomized controlled study. *Eur. J Gastroenterol. Hepatol*, 22, 420–428.
- Russell Dolan, William D Chey and Shanti Eswaran.(2018)** The role of diet in the management of irritable bowel syndrome: a focus on FODMAPs *Jun*;12(6):607-615. doi: 10. 1080/ 17474124. 2018. 1476138. Epub 2018 May 18.
- Sierżantowicz, R., Lewko, J., & Jurkowska, G. (2020).** The Impact of an Individual Educational Program on the Quality of Life and Severity of Symptoms of Patients with Irritable Bowel Syndrome. *International journal of environmental research and public health*, 17(12), 4230.
- Simrén M, Ohman L, Olsson J, Svensson U, Ohlson K, Posserud I, Strid H.(2010).** Clinical trial: the effects of a fermented milk containing three probiotic bacteria in patients with irritable bowel syndrome - a randomized, double-blind, controlled study. *Aliment Pharmacol Ther.* 2010 Jan 15; 31(2):218-27.
- Torkzadeh, F., Danesh, M., Mirbagher, L., Daghighzadeh, H., & Emami, M. (2019):** Relations between coping skills, symptom severity, psychological symptoms, and quality of life in patients with irritable bowel syndrome. *International journal of preventive medicine*, 53(1), 284-295.
- Uday C. Ghoshal, Philip Abraham,Shobna J. Bhatia, Sri Prakash Misra,Gourdas Choudhuri, K. D. Biswas,Karmabir Chakravartty, et al.(2013).** Comparison of Manning, Rome I, II, and III, and Asian diagnostic criteria: Report of the Multicentric Indian Irritable Bowel Syndrome (MIIBS) study. *Indian Journal of Gastroenterology* 32(6) DOI: 10. 1007/s12664- 013-0365-7.
- Vo Duy T, Nguyen N, and Bui T.(2020).** Effectiveness of educational intervention carried out by clinical pharmacists for the quality of life of patients with irritable bowel syndrome: A randomized controlled trial. *Journal of Gastroenterology and Hepatology* DOI: 10.1002/jgh3.12477.