

Effect of Instructional Guidelines on Severity of Symptoms For Patients with Irritable Bowel Syndrome

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Abstract

Background: Irritable bowel syndrome (IBS) is a functional gastrointestinal disorder characterized by a group of symptoms that commonly include abdominal pain, abdominal bloating and changes in the consistency of bowel movements. **Aim of study** was to assess the effect of instructional guideline for patient with irritable bowel syndrome. **Design:** A quasi-experimental (pre and post) research design was used. **Setting:** The study was conducted at gastrointestinal outpatient clinic at Ain Shams University Hospital. **Subjects:** A purposeful subject of 70 adult patients diagnosed with IBS. **Tools:** Three tools were used for data collection. Tool (I): A structured interview questionnaire that consists of (four) parts. Part I: Patients' demographic characteristics. Part II: Clinical assessment format. Part III: Questionnaire to assess patients' level of knowledge. Part IV: Questionnaire to assess patient's health practices. Tool (II): Hospital anxiety and depression Scale (HADS). Tool (III): Pain Rating Scale. **Results:** The results revealed that total level of knowledge and practices scores of patients' post-implementation of instructional guidelines were improved than that of their pre-scores. It reveals that 85.7% of the studied sample had severe pain intensity pre implementation of instructional guidelines compared with 5.7% post implementation. 51.4% of the study sample had moderate level of bloating pre implementation of instructional guidelines compared to 45.7% post implementation. Also, on the effect on activity of daily living, 54.3% were moderately affected pre implementation compared to 18.6% post implementation. Moreover, there was highly statistically significant difference between them (P-value 0.000) respectively. Also, a decrease in the level of abnormal anxiety from 20% to 8.6% pre / post implementation of instructional guidelines, respectively. **Conclusion:** The study concluded that, application of instructional guidelines intervention for adult patients suffering from irritable bowel syndrome, reflected a highly statistically significant positive impact on patients' expected outcomes related to knowledge, health practices and reduces IBS symptoms severity compared to the previously determined percentage before implementing the instructional guidelines. **Recommendations:** 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: Irritable bowel syndrome, instructional guidelines, symptoms severity.

Introduction

Irritable bowel syndrome (IBS) is a complex gastrointestinal (GI) disorder characterized by a group of

symptoms including abdominal pain, bloating, and

altered bowel habits. (Oka et al., 2020).

The best described risk factor is acute enteric infection, but irritable bowel syndrome is also more common in people with psychological comorbidity and in young adult women than in the rest of the general population. All types of stress, whether physical, psychosocial, or psychological stresses are strongly associated with IBS and can affect IBS symptom. IBS can be classified based on the predominant bowel habit into constipation IBS (IBS-C), diarrhea (IBS-D) and mixed or alternating IBS (IBS-M or IBS-A) where the patient has mixed bowel habits (**Alreshidi et al 2024**).

It has an estimated prevalence of 10 to 25% of the United States, with significant geographic variability, with the highest rates in South America 17–21% and the lowest rates in South Asia 7–9% and 5.6% in the Middle East and Africa. IBS disproportionately affects females compared to males: 1.5- to 3-fold. It occurs in patients of all age groups, with onset of symptoms by the age of 35 in 50% of patients and decreasing prevalence in individuals over the age of 50 (**Souha et al., 2023**).

The pathophysiology of irritable bowel syndrome is incompletely understood, but it is well established that there is disordered communication between the gut and the brain, leading to motility disturbances, visceral hypersensitivity, and altered CNS processing. (**lacy et al., 2021**).

In general, treatment is targeted at addressing a patient's most troublesome symptoms, be that abdominal pain, diarrhea, constipation or bloating. Mild symptoms often can be controlled by managing stress and by making changes in diet and lifestyle (**Bhavana and Suraj 2024**).

Effective management of IBS include a strong, reassuring physician-patient relationship, followed by

patient education, dietary advice, and stress reduction. For nonresponding patients, the therapeutic approach may include non-pharmacological therapies and / or pharmacotherapy. Foundational elements of this relationship include clear communication, practical support, and compassion (**Paul & Max, 2024**).

Significance of the study:

The global prevalence of IBS is currently estimated at 15%, and IBS symptoms occur in about 10–20% of Westerners. Due to its chronic relapsing course, up to 50% of patients consult a physician for these symptoms. In multicenter cross-sectional study, the mean prevalence of IBS was 25.2%, with Sudan and Egypt having the highest percentages. The prevalence of IBS was higher among Africans than Caucasians, and it seems that environmental and genetic factors play a role (**Zhang et al.,2022 & Ahmad et al., 2023**).

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 (**Ahmad et al., 2023**).

Therefore, lifestyle modifications are 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 instructional guidelines and make life style changes which have an important role in achieving better patient outcomes by improving daily living activities, and quality of life.

Aim Of The Study

The study aims to assess the effect of instructional guideline for patient with irritable bowel syndrome through:

- Assessing patients with irritable bowel syndrome level of knowledge and practices related to IBS and its management.
- Assessing patients with irritable bowel syndrome symptoms.
- Assessing patients with irritable bowel syndrome level of pain and anxiety.
- Develop an instructional guideline for patients with IBS
- Evaluate the effect of instructional guideline protocol on patients' knowledge, practice, symptoms, level of pain and anxiety.

Hypothesis of the study

H1: The patients' knowledge scores regarding irritable bowel syndrome will be improved post implementation of instructional guideline protocol, compared with their pre-implementation scores.

H2: The patients' health practices scores regarding irritable bowel syndrome will be improved post implementation of instructional guideline protocol, compared with their pre-implementation scores.

H3: The patients' symptoms severity and anxiety level post implementation of instructional guideline protocol will decrease compared to their pre-implementation phase.

Operational definition:

Instructional guideline is concerned with patient's knowledge, practice, symptoms and how to manage pain and anxiety regarding irritable bowel syndrome.

Subjects And Method

Subjects and methods for this study were portrayed under four main designs as the following:

- I. Technical Design.
- II. Operational Design.
- III. Administrative Design.
- IV. Statistical Design.

I-Technical Design:

The technical design included research design, setting, subjects and tools of data collection used in this study.

Research Design

A quasi-experimental (pre and post) research design was utilized to achieve the aim of this study.

Quasi-experimental studies evaluate the association between an intervention and an outcome using experiments in which the intervention is not randomly assigned. These studies are often used to evaluate rapid responses to outbreaks or other patient safety problems requiring prompt non-randomized interventions. They are sometimes called ex-post facto design or after the fact experiment, because the experiment is conducted after the groups have been formed. The independent variable has already occurred and hence, the experimenter studies the effect after the occurrence of the variable. (Baldwin, 2021).

A- Study Setting

The study was conducted at gastrointestinal clinic and internal medicine clinic at Ain Shams University Hospital; it was one room consisted of three partitions for patient's examination and small reception area. This room was used as gastrointestinal clinic on Saturday and Wednesday while the rest of the

week was used for internal medicine clinic except Friday (day off).

B- Subjects:

A nonprobability purposeful sampling of 70 adult patients was included from the population who have met the inclusion criteria within a year and received care from the previously mentioned setting. The inclusion criteria were adult patients with their ages ranged from 20-60 years old and who visited the previously mentioned setting, were fully oriented, and agreed to participate in this study. Exclusion criteria included: Patients who had other concomitant medical conditions such as heart disease, respiratory problem, kidney disease, abdominal cancer and obese patients. As well as, patients who are seriously ill and patients with severe psychiatric disorders. They were excluded from the enrolled patients by reviewing their medical histories.

The sample size was calculated according to the study design, objectives of the study and review of past literature and at power 80% and confidence level 95% and degree of error =0.05 by the following equation:

$$n = \frac{N \times p(1-p)}{([N - 1 \times (d^2 \div z^2)] + p(1-p))}$$

N ----- Population size = 158

Z -----value for 90% confidence limits = 1.645

D -----margin errors = 0.05

P-----proportion population = 0.5

$$n = \frac{140 \times 0.5(1-0.5)}{\{[140 - 1 \times (0.0025 + 2.7060)] + 0.5(1-0.5)\}}$$

Patients =70 (pre and post)

(Thompson, 2012)

Tools of Data Collection

Data was collected using the following tools:

First tool: Patients interviewing questionnaire.

It was designed by the investigator; it consisted of four parts:

Part I: Patients demographic characteristics.

It consisted of (5) closed ended questions and it was used to describe characteristics of studied patients as regard (age, sex, marital status, level of education and work status).

Part II: Clinical Assessment format (clinical data).

It consisted of (7) questions about (patient's associated signs and symptoms, duration of illness, post infectious IBS, psychological problems, family history and past medical history. This tool was developed in Arabic language by investigator after reviewing recent literature review and it was adopted from (khan et al., 2019) and (Christopher & Gregory 2021). Part 2, 3, and 4 was assessed twice, pre/post implementation of nursing intervention protocol.

Part III: Adult patients' knowledge regarding irritable bowel syndrome (pre/post).

This was used to assess patient's level of knowledge regarding irritable bowel syndrome. It was developed by the investigator in simple Arabic language based on recent and relevant literatures (Abdul Khaliq et al., 2020) and (Belogianni et al., 2023) it consisted of (5) true or false questions in a tabular form about IBS as: definition (3 questions), prevalence (3 questions), causes (7 questions), signs and symptoms (3 questions), diagnosis (4 questions) and treatment (10 questions). It also has (5) MCQ (multiple choice questions) with (4) options each.

Scoring system:

The score was ranging from “True =1” to “False =0”, Total items score was from 100% grades and it was categorized as follows:

- ✓ **Satisfactory $\geq 75\%$ (score: 72.9% pre - 90%post)**
- ✓ **Unsatisfactory $< 75\%$ (score: 27.1% pre – 10% post)**

Part IV: Adult patients' practice regarding irritable bowel syndrome (pre/post).

It consisted of (12) true or false questions about the patients with IBS health practices related to regulation of diet, exercises, relaxation techniques, medications and follow up. It was adapted from (Vidlock and Chang 2022) and (Khanna, et al., 2020).

Scoring system:

The score was ranging from “Yes=1” to “No=0”, Total items score was from 100% grades it was categorized as follows:

- ✓ **Satisfactory $\geq 75\%$ (score: 5.7% pre - 38.6% post).**
- ✓ **Unsatisfactory $< 75\%$ (score: 94.3% pre- 61.4% post).**

Second tool: Hospital Anxiety and Depression Scale (HADS).

This is a valid and reliable tool. It was adopted from (Zigmond & Snaith, 1983). It was used in the study to assess patients' level of anxiety only, it included the 7 items questionnaire measure of symptoms of anxiety occurring in the past week (Items related to anxiety No: 1, 3, 5, 7, 9, 11, and 13). Each item is rated on a four-level of anxiety scale: (0=not at all, 1=not much, 2=yes sometimes and 3=yes definitely). Item scores are summed to give sub-scores for anxiety.

Scoring system: Scores ranges between 0 and 21. Grading: 0-7 respective subscale are considered

normal/ 8-10 considered borderline abnormal (borderline case) / 11-21 indicate abnormal (case).

Third Tool: Pain Rating Scale:

was quoted from McCaffery & Pasero (1999) to assess the level of pain intensity in patients under study. This scale is concerned with the intensity of pain from 0:10 as 0= No pain and 10= the worst pain. Mild 1-3, 4-6 moderate 7-10 severe. And on a scale of 0-100 to evaluate IBS symptom severity on the patient, such as: pain severity (0=No pain & 100=Very sever), how often it occurs (0=Never & 100=Always), severity of bloating (0=No bloating & 100= Very sever), satisfaction with stool frequency (0=Very satisfied & 100=Very dissatisfied) and effect on activity of daily living (0=Not at all & 100=Very much). (NO/never =0, Mild 10-30, moderate 40-60, sever 70-90 and very sever 100).

II-Operational design:

It included preparatory phase, tools validity and reliability, pilot study and field work.

A- The preparatory Phase: It included reviewing of the recent related literature and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals, and magazines in order to develop and modify the data collection tools. Development of the tool was under supervisors' guidance and expert's opinions were considered.

B- Tools Validity and Reliability**Validity:**

The face and content validity (two methods of assessing how well a measure captures the constructs it is supposed to measure) of the used tools were done through a panel of five experts from in the field of the study.

Four professors in medical surgical nursing and one from internal medicine, Faculty of Nursing, Ain Shams University. They were from different academic levels (2 professors, 3 assistant professors). Their opinions were regarding comprehensiveness, accuracy, clarity, relevance, and appropriateness of the study tools. Modifications in paraphrasing were done based on experts' judgment and the final form was developed.

Reliability analysis:

Testing reliability of the proposed tools was done statistically by Cronbach's alpha test. It was used to examine whether the questionnaires had internal consistency. The reliability score of tools reached (0.703, 0.701, 0.819 and 0.708) for knowledge, practice, anxiety and pain respectively.

Pilot study:

A pilot study was carried out on 10% of study subjects to test clarity, feasibility and applicability of the data collection tools. The subjects who were included in the pilot study were included in the study sample because no modification was done after conducting the pilot study.

Ethical Consideration :

The following research ethics was considered and maintained during the study:

- A written approval was obtained from the scientific research ethical committee in faculty of nursing Ain Shams University before starting the study.
- The aim of the research was explained to the participants.
- Written consent was obtained from each patient to participate in the study, after clarifying the procedures of the study. Participants were informed about their right to refuse participation

and to withdraw at any time without giving any reason.

- The researcher was assured of maintaining anonymity and confidentiality of the patients included in the study.

Field work:

The study started from Dec. 2023 to June 2024. It was designed in three phases; Assessment, implantations and evaluation.

➤ **Assessment phase:**

- During this phase an official approval was obtained to conduct the study from the director of Ain Shams university hospital and head of internal medicine and GTI clinics.
- An exploratory visit was done to the clinic in order to estimate the intended patients flow rate, and suitable time for collecting data.
- All the data collection tools were distributed to the patients according to their availability after explaining the purpose of the study and obtaining their consents in order to assess patient's educational needs and obtain baseline data.
- Development of the instructional guidelines booklet, was done based on current literature review according to needs assessment to improve patients' knowledge & practices regarding IBS. It consists of:
 - Brief anatomy of the GIT
 - Definition of irritable bowel
 - Causes/risk factors of IBS
 - Signs and symptoms of IBS.
 - Diagnosis, treatment and complications of irritable bowel syndrome.
 - Educational guidelines for patients with irritable bowel syndrome related to nutrition, exercise, stress reduction and follow up.
- Media was proposed including the instructional guideline booklet and audiovisual materials (CD).

➤ **Implementation phase:**

- During this phase, nursing intervention booklet was given to each patient and explained through group discussions for 3-4 successive sessions.
- An instructional media was used. Each session took approximately 30-45 minutes, 3 times per week in the morning 9 am: 1 pm. Sessions was held in patient groups of 5-10 patients according to their availability.

➤ **Evaluation Phase:**

- It was done using the same pretest tools two weeks post intervention.
- There was Comparison between the collected data before and after intervention to determine the effectiveness of the instructional guideline in improving patients' signs and symptoms.

III- Administrative design :

Approval to carry out this study was obtained from the Director of Ain Shams University Hospital and the heads of the internal medicine and GIT

Result

Table (1): Shows that, 31.4% of the studied patients' age from 20 <30 years, the Mean \pm SD of age 37.57 \pm 10.96years. 71.4% of them are female. Also 87.1% of the studied patients were married, 44.3% of the studied patients were university students. More over 71.4% of the studied patients were working.

Table (2): Demonstrates an increase level of satisfactory knowledge from 72.9% to 90% pre and post implementation of instructional guidelines respectively and, there was highly statistically significant difference between pre / post implementation of nursing guideline at meaning of irritable bowel syndrome,

clinic in which the study was conducted.

IV-Statistical design :

The collected data were organized, analyzed using appropriate statistical significant tests. All data were tabulated and subjected to statistical analysis.

Statistical analysis was performed by using Statistical Package for Social Science (SPSS) in general (version 25), also Microsoft office Excel was used for data handling and graphical presentation. The data was presented as number and percent. Relations between different variables were tested using Chi-square test (X^2) to compare the different between pre / post implementation nursing guideline. Coefficient of correlation (r) test was used to measure the strength of the association between two variables.

Probability (P-Value) was considered significant as the following:

Insignificant $p > 0.05$

Significant $p < 0.05$

Highly significant $p < 0.01$

prevalence of irritable bowel syndrome, diagnosis of irritable bowel syndrome, general information of irritable bowel syndrome and total level of knowledge at P-value 0.000, 0.004, 0.000, 0.000 and 0.006 respectively.

Table (3): Displays that, there was an increase level of satisfactory health practices from 5.7% to 38.6% pre / post implementation of instructional guideline. Also, there was a highly statistically significant difference between pre / post implementation of instructional guideline at all of level of health practices and total level of health practices at P-value 0.000, respectively except skip medications after a few days of symptom relief.

Table (4): Shows the differences between intensity of pain, severity of bloating and activity of daily living pre / post implementation of instructional guidelines. It reveals that 85.7% of the studied sample had severe pain intensity pre implementation of instructional guidelines compared with 5.7% post implementation. 51.4% of the study sample had moderate level of bloating pre implementation of instructional guidelines compared to 45.7% post implementation. Also, on the effect on activity of daily living, 54.3% were moderately affected pre implementation compared to 18.6% post implementation. Moreover, there was highly statistically significant difference between them (P-value 0.000) respectively.

Table (5): Displayed that, there was a negative correlation between total level

Table (1): Number and percentage distribution of Demographic characteristics of the studied patients (n. =70)

of knowledge and health practices with IBS symptom severity (pain, bloating and activities of daily living) post implementation of nursing guidelines

Figure (1): Indicates that, 20% and 8.6% of the studied patients had abnormal anxiety pre / post implementation of instructional guidelines, respectively. 27.1% and 15.7% of the studied patients had borderline anxiety pre / post implementation of instructional guidelines, respectively. While 52.9% and 75.7% of the studied patients had normal anxiety pre / post implementation of nursing guidelines, respectively.

Items	n.	%
Age		
20 <30 years	22	31.4
30 <40 years	20	28.6
40 <50 years	17	24.2
50 <60 years	9	12.9
>60 years	2	2.9
Mean ± SD	37.57±10.96	
Gender		
Male	20	28.6
Female	50	71.4
Marital status		
Single	9	12.9
Married	61	87.1
Educational level		
Illiterate	5	7.1
Reads and writes	19	27.2
Intermediate	11	15.7
University students	31	44.3
Post graduated	4	5.7
Work		
Working	50	71.4
Not working	20	28.6

Table (2): Comparison between patients' Satisfactory level of knowledge regarding irritable bowel syndrome pre / post implementation of instructional guidelines. (No. =70)

Items	Satisfactory				t-test	
	Pre		Post		t	P-Value
	No.	%	No.	%		
General Knowledge about IBS:						
Meaning of irritable bowel syndrome.	44	62.9	64	91.4	4.644	0.000**
The prevalence of irritable bowel syndrome.	34	48.6	50	71.4	2.984	0.004**
Causes or risk factors for irritable bowel syndrome.	52	74.3	52	74.3	--	--
Signs and symptoms of irritable bowel syndrome.	45	64.3	44	62.9	0.217	0.829
Diagnosis of irritable bowel syndrome.	20	28.6	41	58.6	4.035	0.000**
Treatment of irritable bowel syndrome.	62	88.6	68	97.1	1.934	0.057
General information about irritable bowel syndrome.	27	38.6	64	91.4	7.933	0.000**
Total level of knowledge.	51	72.9	63	90	2.813	0.006**

Table (3): Comparison between patients' level of health practice pre / post implementation of nursing guideline (n. =70)

Items	Satisfactory				t-test	
	Pre		Post		t	P-Value
	n.	%	n.	%		
Avoiding certain foods that are known to cause IBS symptoms.	40	57.1	67	95.7	5.641	0.000**
Practice yoga/meditation to reduce stress/anxiety.	7	10	43	61.4	7.080	0.000**
Exercise regularly to prevent irritable bowel syndrome.	3	4.3	38	54.3	7.494	0.000**
Get enough sleep.	20	28.6	63	90	9.409	0.000**
Avoid eating gluten (such as wheat, barley, and rye)-containing food products that may worsen symptoms.	29	41.4	66	94.3	8.331	0.000**
Keep a diary of what eat and any symptoms develop.	51	72.9	68	97.1	4.377	0.000**
Cook home-cooked meals using fresh ingredients.	30	42.9	62	88.6	6.872	0.000**
Postpone or skip meals.	55	78.6	16	22.9	-7.415	0.000**
Drink more than 3 cups of tea or coffee a day.	59	84.3	6	8.6	-13.645	0.000**
Regularly take medications prescribed for irritable bowel syndrome.	45	64.3	66	94.3	4.583	0.000**
Skip medications after a few days of symptom relief.	63	90	64	91.4	0.276	0.784
After following doctor's advice regarding diet, lifestyle, medications, and exercise, daily life is now less affected.	53	75.7	69	98.6	4.194	0.000**
Total level of health practices	4	5.7	27	38.6	4.931	0.000**

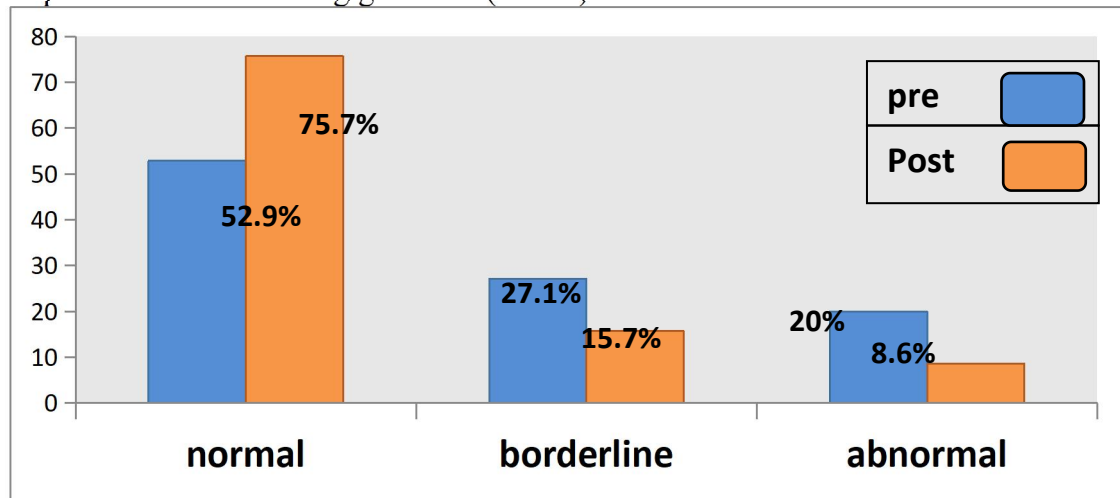
Table (4): Comparison between patients' level of pain, severity of bloating and activity of daily living, pre / post implementation of nursing guideline (n. =70)

Items	Pre		Post		t-test	
	n.	%	n.	%	t	P-Value
Intensity of pain:						
Mild	1	1.4	23	32.9	-14.359	0.000**
Moderate	9	12.9	43	61.4		
Severe	60	85.7	4	5.7		
Severity of bloating:						
No	2	2.9	3	4.3	-7.523	0.000**
Mild	5	7.1	34	48.6		
Moderate	36	51.4	32	45.7		
Severe	27	38.6	1	1.4		
More severe	0	0	0	0		
Effect on activity of daily living:						
Not at all	0	0	0	0	-13.053	0.000**
Mild	5	7.1	56	80		
Moderate	38	54.3	13	18.6		
Severe	27	38.6	1	1.4		
Very severe	0	0	0	0		

Table (5): Correlation between patients' total level of knowledge and practices with IBS symptom severity, (pain, bloating and effect on activities of daily living) post implementation of instructional guidelines.

Items	r	P-Value
Total level of knowledge	2.813	0.006**
Total level of health practices	4.931	0.000**
Intensity of pain	-14.359	0.000**
Severity of bloating	-7.523	0.000**
Effect on activities of daily living	-13.053	0.000**

Figure (1): Percentage distribution of patients' total level of anxiety pre / post implementation of nursing guideline (n. =70)



Discussion

Irritable Bowel Syndrome (IBS) is a chronic gastrointestinal disorder characterized by a group of symptoms including abdominal pain, bloating, and altered bowel habits. It affects a significant portion of the population worldwide, with varying prevalence rates reported between 10-15% globally. IBS has a profound impact on the quality of life of individuals, often leading to psychological distress, decreased work productivity, and increased healthcare utilization. Given its chronic nature and the burden it imposes on patients and healthcare systems, effective management strategies are crucial (Black & Ford, 2020).

The rationale behind instructional guidelines is that informed patients are better equipped to adhere to treatment plans and make informed decisions about their health, potentially leading to a reduction in symptom severity. These guidelines typically encompass information on dietary recommendations, lifestyle changes, and coping strategies Halpert et al., (2020).

So, the current study was aimed to assess the effect of instructional guidelines on severity of symptoms for patient with irritable bowel syndrome. To fulfill this aim, it was hypothesized that: Patients with irritable bowel syndrome who will receive and apply the instructional guidelines; their level of knowledge and health practices will improve, while disease symptoms and anxiety level will decrease.

Regarding the age of studied patients, the current study illustrated that, one third of the studied patients age from twenty to thirty years, with the Mean age of (37.57±10.96) years, this finding indicate that irritable bowel syndrome has a peak onset among this age groups and this might be due to the fact that this age group is usually associated with being responsible for a family (social and financial burden). This result agrees with Sperber et al., (2021) in a study titled "Worldwide prevalence and burden of functional gastrointestinal disorders. Gastroenterology" reported that IBS prevalence decreases with age, and the prevalence in individuals aged 18-39 years is 5.3%, 40-64 years is 3.7% and > 65 years is 1.7%.

Relating to gender, the current study shows that three quarters of the studied patient were female. This may be due to the effect hormones have on gastrointestinal (GI) function or the biological and sociocultural factors related to sex/gender that interact to influence noncommunicable diseases. This result is on line with **Mohamed, et al., (2020)** in a study titled “Effect of Nursing Intervention Protocol on Patients with Irritable Bowel Syndrom” revealed that; more than half of the subjects were females (55%), according to the researcher, this could be due to women usually have many responsibilities and this lead to exposure to more stress which is the most leading cause to IBS.

As regards the study subject’s knowledge about the concept of IBS and how to control it pre / post implementation of nursing guidelines, the results of the present study indicated that there was an improvement in the studied adult patients' knowledge post implementing instructional guidelines as compared to pre implementing guidelines. There was a highly statistically significant difference (P-value 0.006). From the researchers' point of view, this result reflects the positive effect of instructional guideline implementations, which meet the adult patients' needs and provide them with sufficient knowledge to maintain health and reduce symptom severity.

Also, from the researcher’ point of view, the unsatisfactory level for most of the knowledge items may be due to less awareness and concentration on this syndrome in the mass media which is the most way people can attain knowledge. This underscore the importance of guidelines. These finding is on similarity with **Ghareeb et al., (2020)** in a study titled “Effect of an Educational Module on

Knowledge, Symptoms Severity and Quality of Life in Patients with Irritable Bowel Syndrome.” 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.

Regarding the patients' level of health practices pre / post implementation of nursing guideline, the present study results revealed an improvement in patients' practice and closed to half of them had adequate practice post implementation of instructional guidelines. From the researchers' point of view, it reflected the good impact of the instructional guidelines on improving practices. Also, there was highly statistically significant difference post implementation of nursing guidelines.

This result is in line with **Vo duy et al., (2020)**. In a study titled “Effectiveness of educational intervention carried out by clinical pharmacists for the quality of life of patients with irritable bowel syndrome” They confirmed that accurate description was 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 health practices compared to before the intervention

Concerning Patients' level of anxiety pre / post implementation of nursing guideline. The current study

reveals that, there was highly statistically significant difference between pre / post implementation of nursing guideline as improved post implementation of nursing guideline at worrying thoughts go through mind, get sudden feelings of panic and total level of anxiety. The reduced levels of anxiety could be due to many causes, firstly: education about the disease and management including answering the patients' questions related to illness and correction of misconceptions such as risk that IBS can turn into serious disease, secondly: following diet regimen that can decrease the GIT symptoms and also practicing regular exercises as walking, added to that practicing relaxation techniques all can decrease anxiety levels.

Accordingly, this result is congruent with that of **Orock et al., (2021)** in a study titled "Importance of Non-pharmacological Approaches for Treating Irritable Bowel Syndrome: "Mechanisms and Clinical Relevance" reported that, combination of education about the disorder, relaxation, and cognitive restructuring techniques used to address negative thinking patterns, symptom-related anxiety and hypervigilance, and stress reduction techniques based on the premise that if stress causes symptoms, then stress reduction may provide symptom relief.

Regarding patients' level of pain.

The current study reveals that, there was highly statistically significant difference between pre / post implementation of nursing guideline as improved post implementation of nursing guideline at intensity of pain, severity of bloating and effect on activity of daily living. Also, the result findings revealed that there was a significant improvement in the total severity level of pain on activity of daily living after nursing intervention.

This could be due to improve patient's clinical features after acquiring knowledge and health practices through the instructional guidelines, to improve their quality of life and activities of daily living.

Regarding correlation between patients' total level of knowledge and practices with IBS symptom severity, the current study reveals that, there was a negative correlation between total level of knowledge and health practices with IBS symptom severity (pain, bloating and effect on activities of daily living) post implementation of nursing guideline. This implies that as the studied patients received knowledge regarding IBS and implemented on it, their symptom severity begins to decrease till IBS has decreased/no effect on activities of daily living.

This finding was supported by **Farid et al., (2021)** in a study titled "Lifestyle Modification on Symptoms Reduction and Quality of Life Improvement among Adults with Irritable Bowel Syndrome" they reported that a negative correlation occurs between IBS-knowledge and IBS-SSS (Severity Symptom Scale) in pre, and post intervention while there is positive correlation between IBS knowledge and IBS-QOL (quality of life) in pre, and post intervention.

Conclusion

- Focusing on the results of the current study, it can be concluded that, application of instructional guidelines intervention for adult patients suffering from irritable bowel syndrome, reflected a highly statistically significant positive impact on patients' expected outcomes related to knowledge, health practices and reduces IBS symptoms severity compared to the previously determined percentage

before implementing the instructional guidelines.

- Moreover, the current study results support the research hypothesis.

Recommendations

Based upon the results of the current study, the following recommendations are suggested:

Educational level:

- 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.
- Instructional guidelines intervention is an appropriate model to be implemented for IBS disease and should be available in outpatient clinic.
- Establishing national programs to increase public awareness about healthy diet and the importance of reducing stress in order to alleviate suffering of IBS.

Organizational level:

- Developing and dissemination of educational guidelines in media such as; social media and Mobil applications to improve symptoms severity among patients with irritable bowel syndrome and reduce health care cost.

Further research;

- Replication of the current study with a bigger statistical sample size selected from different regions and a longer follow-up period including all types of IBS in order to get more broadly applicable findings.

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