## Impact of Lifestyle Modification Program on the Geriatric Patients with Gastroesophageal Reflux Diseases

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## Abstract

**Background:** Gastroesophageal reflux disease (GERD) is the most common upper gastrointestinal disorder among the elderly. **Aim of the study:** This study aimed to evaluate the effect of a lifestyle modification program on the geriatric patients with GERD. **Subjects and methods: Design:** A quasi-experimental, one-group pre-post intervention research design was used. **Setting:** The study conducted at El-Raghey Hospital for Gastrointestinal and Liver Diseases, Assiut University Hospitals, Egypt. **Subject:** The study included 70 elderly patients with a mean age of  $66.51\pm7.61$  years. **Tools of data collection:** Four tools were utilized to assess patients' personal data, health condition, GERD knowledge, symptom frequency, health-related quality of life, and lifestyle modifications. **Results:** Results showed a significant improvement in knowledge, GERD symptoms, and quality of life after the intervention, with a statistically significant difference (P < 0.001). **Conclusion:** These findings highlight the positive impact of lifestyle modification programs on geriatric patients' health. **Recommendation:** Therefore, increasing awareness of GERD among high-risk elderly populations is strongly recommended.

Keywords: Gastroesophageal reflux disease, Geriatric patient, Lifestyle modification program.

#### Introduction

Gastroesophageal reflux disease (GERD) develops when the reflux of stomach contents causes symptoms or a range of potential esophageal and extraesophageal manifestations. It has a prevalence of 10-20% in the Western world, making it a highly common condition globally (Yu, et al., 2022). In Saudi Arabia, there is a higher incidence of GERD than Western and East Asian nations, where the percentage reached 28.7%, according to a 2018 Saudi Arabian study (Alsuwat et al., 2018). Over the course of a year, approximately 60% of individuals experience GERD symptoms, while 20-30% suffer from it at least annually. The typical symptoms include regurgitation and heartburn, while extra-esophageal manifestations may be present as chronic cough, laryngitis, and asthma (Savarino et al., 2017). There has been a rising incidence of GERD and its complications worldwide, esophagus including Barrett's and

esophageal adenocarcinoma (Yu, et al., 2022).

The elderly is more prone to esophageal extra-esophageal and complications of GERD, which can be potentially life-threatening due to age-related progressive impairment of esophageal clearance and degradation of the gastroesophageal junction. GERD has a direct impact on quality of life, particularly in older adults. Studies have shown that abnormal gastroesophageal reflux occurs more frequently in the elderly than in younger individuals. The mean prevalence of pH < 4was significantly higher in elderly patients (32.5%) compared to vounger patients (12.9%), indicating a greater severity of acid exposure in older individuals (Halawani and Banoon, 2020).

Therapy for GERD is typically approached in a graded manner, beginning with lifestyle modifications, which are considered the cornerstone of treatment. Patients with mild to moderate symptoms (without dysphagia, hoarseness, or aspiration) are advised to adopt lifestyle changes, including avoiding tight-fitting clothing, reducing or eliminating alcohol and tobacco use, and avoiding foods that may trigger symptoms. Additionally, they are encouraged to refrain from eating 4-6 hours before sleep, lose weight if overweight, and elevate the head of the bed by 4-6 inches to reduce nocturnal reflux. While drug therapy provides immediate relief from heartburn pain and discomfort, long-term treatment healing esophagitis focuses on and preventing complications by maintaining remission (Hussein et al., 2021).

Lifestyle modification referred to the process of gradual adaptation of corrective lifestyle habits such as diet, physical activity and sleep for prevention and management of various diseases (Ranjan, 2022). Patient education programs have been shown to be beneficial in managing various diseases. To educate effectively patients with gastroesophageal reflux disease (GERD), it is essential to assess their existing knowledge about the condition. Lifestyle interventions, including dietary modifications, psychological support, exercise, and acupuncture, can have a synergistic effect on drug therapy by enhancing treatment efficacy. improving adherence, and alleviating symptoms. Gerontological nurses play a crucial role in the prevention and management of GERD in older adults by providing education, promoting healthy behaviors, and advocating for patients (Haruma et al., 2015).

## Significance of the study

The prevalence of GERD has been reported to increase with age. Among elderly residents in American nursing facilities, GERD is the sixth most common disease, with a prevalence of 23%. Additionally, the prevalence among elderly outpatients attending primary care clinics may be as high as 20%. However, symptom frequency varies among older adults. According to one study, daily GERD symptoms occur in 8% of men and 15% of women over the age of 65 years **(Kurin and Fass, 2019)**. No previous studies have been conducted in Egypt on geriatric patients with GERD. Therefore, this study aimed to evaluate the effect of a lifestyle modification program on geriatric patients with GERD.

## **Operational definition**

**Gastroesophageal reflux disease:** It is a condition where the retrograde flow of the stomach contents into the esophagus or beyond into other regions such as oral cavity, larynx, or the lungs results in inflammation of the esophageal mucosa.

**Quality of life (QOL)**: It is a concept that aims to capture the well-being of a population or individual regarding both positive and negative elements within the entirety of their existence at a specific point in time.

A lifestyle: It includes activities and habits that encourage the development of total physical, mental, and spiritual fitness, and which reduces the risk of major illness.

## Aim of the study

This study aimed to evaluate the effect of a lifestyle modification program on the geriatric patients with gastroesophageal reflux disease.

## Specific objectives

- 1- To assess the elderly patients' gastroesophageal reflux disease knowledge.
- 2- To assess the elderly patients' gastroesophageal reflux disease symptoms frequency.
- 3- To assess the elderly patients' gastroesophageal reflux diseaseshealth related quality of life.
- 4- To plan, implement and evaluate the lifestyle modification program on symptoms and quality of life of geriatric patients with GERD.

#### Study hypothesis

**H 1:** There is a high level of GERD symptoms frequency, low GERD- related quality of life and unsatisfactory knowledge score among elderly patients before implementing lifestyle modification program.

**H 2:** The lifestyle modification program about GERD diseases will have positive effects on symptoms frequency and level of knowledge of elderly patients in posttest.

**H 3:** The lifestyle modification program about GERD diseases will have positive effect on quality of life of elderly patients in posttest.

# Subjects and methods Research design:

A quasi-experimental research design (one group pre, and posttest) was utilized to conduct this study.

#### Setting:

The study was conducted in the clinics and departments of EI-Raghey Hospital for Gastrointestinal and Liver Diseases at Assiut University Hospitals.

## Subjects:

A purposive subject of 70 elderly patients of both sexes, aged 60 years and above, diagnosed with GERD, was selected from the previously mentioned setting. The required sample size, as determined by the online Sample Size Calculator (http://www.raosoft.com/samplesize.htm) , was 92.

#### Inclusion criteria

- Elderly patients aged 60 years and above.

- Elderly patient diagnosed with gastroesophageal reflux disease.

## **Exclusion criteria**

-Gastric lesion.

- Esophageal hiatal hernia.

-GIT Surgery with one year before diagnosed with GERD.

- Esophageal fistula.
- GIT Malignancy.
- -Mental illness.

-Serious comorbidities.

**Tools of the data collection:** In order to collect the necessary data three tools was used:

**Tool I:** Patient's Structured Interview Questionnaire. This tool was developed by the researcher and consists of three parts:

**The first part:** Personal Data included age, gender, residence, marital status, education, and occupation.

**The second part:** Health condition which covered the presence of chronic diseases, smoking status, and past gastrointestinal (GIT) problems such as disease onset, complaints, and previous complications, and Standard Body Mass Index (BMI) ranges (kg/m<sup>2</sup>) according (Centers for Disease Control and Prevention (CDC), 2020) that classified as follows:

Underweight, Less than 18.5

Healthy weight, 18.5 to less than 25

Overweight, 25 to less than 30

Obesity, 30 or greater

- Class 1 Obesity, 30 to less than 35.
- Class 2 Obesity, 35 to less than 40.
- Class 3 Obesity (Severe Obesity), 40 or greater according to world of health organization.

# The third part: GERD Knowledge Assessment Questionnaire:

Designed by the researcher, this section consisted of 10 items assessing elderly patients' knowledge and habits related to GERD. Responses were evaluated both before and after the intervention, with scores categorized as satisfactory ( $\geq 60\%$ ) or unsatisfactory (<60%).

#### Tool II: Gastroesophageal Reflux Disease Questionnaire (GERDQ) – Symptom Frequency Assessment

GERDQ is a six-item diagnostic tool for GERD, assessing symptoms such as nausea, regurgitation, epigastric pain, heartburn, and the use of GERD-related medications. Patients rated the frequency of various symptoms over the past week using a Likert scale (0–3 for positive predictors and 3–0 for negative predictors). The maximum possible score is 18 (Zavala-Gonzales et al., 2014).

Based on the total score, symptom frequency was categorized into two groups:

- High symptom frequency (positive symptoms): ≥8
- Low symptom frequency (negative symptoms): <8</li>

Tool (III): Gastroesophageal Reflux Disease – Health Related Quality of Life (GERDHRQL) questionnaire

The Gastroesophageal Reflux Disease Health-Related Quality of Life Questionnaire (GERD-HRQL) was developed by Velanovich, (2007) and later used in studies such as Alshammari et al. (2020) to assess the impact of GERD on patients' quality of life (QoL). The questionnaire consists of 15 items evaluating the frequency of heartburn, regurgitation, difficulty swallowing, bloating, and the burden of GERD medications over the past two weeks. Each item is scored on a 0 to 5 scale, with a maximum possible score of 75, where a higher score indicates a poorer QoL.

## Scoring system:

- **0** = No symptoms
- **1** = Symptoms noticeable but not bothersome
- **2** = Symptoms noticeable and bothersome but not daily
- **3** = Symptoms bothersome every day

- **4** = Symptoms affect daily activities
- **5** = Symptoms are incapacitating, preventing daily activities

Additionally, the questionnaire included a question assessing the patient's satisfaction with their current condition (Alshammari et al., 2020).

#### Quality of life categorization:

- Very good QoL: 1–30
- Good QoL: 31–45
- Fair QoL: 46–60
- **Poor QoL:** >60

#### Tool (IV): GERD-health related change lifestyle and home remedies questionnaire:

The **lifestyle questionnaire** consists of **19 items** designed to assess daily habits that impact on the quality of life of elderly patients with GERD (**Yuan et al., 2019**). The responses of these items were "Yes" that indicate to engage the elderly in the habit or "No" means not engaged in this habit. The results calculated by the number and percent and compared before and after the implementation of the lifestyle modification program.

## Content validity and reliability

The validity of the tools was assessed and revised by a panel of five experts from the nursing professional staff at Assiut University to ensure accuracy and relevance.

The reliability was measured using Cronbach's alpha test to assess internal consistency, with the following results:

- GERD knowledge assessment: r = 0.85
- GERD symptom frequency questionnaire: r = 0.93
- GERD health-related quality of life scale: r = 0.91
- GERD lifestyle and home remedies questionnaire: r = 0.83

These values indicate strong internal consistency, confirming the reliability of the study tools.

#### **Assessment timing:**

**Tool I (Part 3), Tool II, Tool III, and Tool IV** were administered **twice**—before and after the application of the health education program—to evaluate changes in patients' knowledge, symptoms, quality of life, and lifestyle habits.

#### Lifestyle Educational Program

The program was designed by researchers based on a comprehensive review of current national and international literature. It was carried out in four phases:

## A) Assessment Phase:

- During the first meeting, the researchers introduced themselves, explained the study's nature and purpose, and obtained participants' approval.
- The tools (I, II, III and IV) were used for pretest assessment.
- Based on the pretest assessment, the educational program was designed.

#### B) Planning phase:

- **Teaching location:** The program was conducted in outpatient clinic lecture rooms or any available space.
- **Teaching time:** Scheduled based on the participants' availability.
- Teaching methods & materials:
  - Methods: Lectures and discussions
  - Materials: PowerPoint presentations, pictures, and handouts on GERD, prepared by the researchers and distributed to participants at the end of the program.

#### **C)** Implementation Phase:

- Grouping: Participants were divided into 15 groups based on availability, with 4-5 participants per session.
- Session Duration: Each session lasted 30–45 minutes, held once per week over six weeks.
- Program Structure (Four Sessions):
  - Session 1: Introduction, explanation of study

objectives, and pretest assessment using all study tools.

- Session 2: Basic knowledge about GERD and dealing with symptoms.
- Session 3: Review of previous content, explain the lifestyle which included the daily habits that affect GERD dietarv as recommendations as eating (fast eating, eating beyond fullness, preference of spicy foods, preference of soup, preference for sweets. preference high-fat foods, eating too hot food. preference for hard foods). and herbal remedies.
- Session 4: Review of 0 previous content, continue to explain the other lifestyle habits as chronic stress. sleep (sleep difficulty, lying down soon after eating, eating just before bedtime), smoking, drinking strong tea and coffee, distribution of handouts and illustrations. and a summary of program content. The researchers also followed up on participants' GERD adherence to prevention guidelines.
- Session 3 and Session 4 included lifestyle which included the daily habits that affect GERD ONLY) according to the reference mentioned above (Yuan et al., 2019).

#### D) Evaluation Phase:

 One month after program completion, the researchers conducted a posttest using Tool I (part 3), Tool II, Tool III, and Tool IV to assess the impact of the lifestyle modification program on quality of life of geriatric patients with GERD.

#### Fieldwork

- Data Collection Period: June 1, 2024
  November 30, 2024 (six months).
- Posttest & Materials: Conducted one month after program completion, and participants received a simple Arabiclanguage booklet included how to deal with GERD symptoms and follow the healthy daily habits that improve lifestyle.

## Pilot study

Pilot study was carried out prior starting of data collection on 10% from the sample (7) elderly who were later excluded from the study.

#### Administrative and ethical considerations

Approval was obtained from the Scientific Research Ethical Committee of the Faculty of Nursing, with the ethical code number 1120240781.

Before data collection, official approval was obtained from the Faculty of Nursing Dean, Assiut University, and the directors of El-Raghey Hospital at Assiut University Hospitals to conduct the study. The aim and nature of the research was explained to the relevant authorities.

Following full explanation of the study aim, older participants were informed about the study aim and nature. They were assured that all information would remain confidential and used solely for research purposes. Participation in the study was voluntary, and participants had the right to withdraw at any time without providing a reason.

## Statistical analysis

The data were tested for normality using the Anderson-Darling test and for homogeneity variances prior to further statistical analysis. Categorical variables were described by number and percent, where continuous variables described by mean and standard deviation. Chi-square test and fisher exact test used to compare between categorical variables where comparison between continuous variables by t-test and Anova Test. A two-tailed p < 0.05 was considered statistically significant all analyses were performed with the IBM SPSS 20.0 software.

## Results

**Table 1** presents data and medical history on the 70 elderly patients with GERD included in the study, with a mean age of  $66.51 \pm 7.61$  years. Among them, 57.1% were aged 60-65 years, 57.1% were male, 58.6% were married, 44.3% illiterate, and 57.1% resided in rural areas. Regarding BMI, 40% were overweight, and 22.9% were classified as obese.

**Figure 1** shows that before program, all participants had unsatisfactory knowledge, whereas after education, 91.4% achieved satisfactory knowledge (P < 0.001).

**Table 2** shows a significant reductionin the mean symptom score, decreasing from $10.83 \pm 2.14$  to  $4.31 \pm 2.18$  after the program.

**Table 3** indicates that before program, unhealthy habits such as fast eating (77.1%) and lying down on post-meal (71.4%) were prevalent. However, after program, these behaviors significantly decreased to 1.4% and 0%, respectively (P < 0.001).

**Table 4** shows a significant improvement in GERD-related quality of life (GERD-HRQL), with the score decreasing from (27.5  $\pm$  10.08) to (10.84  $\pm$  6.6) (P < 0.001).

Table 5indicatesthatbeforeprogram, 54.3%ofparticipantsweredissatisfied, whereas after program, 45.7%reported being satisfied (P < 0.001).

Figure 2illustrates a negativecorrelationbetweenpatients'gastroesophagealrefluxdisease(GERD)knowledgeandGERD-HRQLscoresbefore

and after education (r = -0.485, -0.250), indicating that as knowledge improved, GERD-related quality of life scores decreased (i.e., improved quality of life).

Table 6demonstratesstatisticallysignificantassociationsbetweenGERDknowledgeandeducationallevel,occupation, and residence (P < 0.05).

## Discussion

Gastroesophageal reflux disease (GERD) is a common chronic disorder that troublesome causes symptoms and significantly impacts quality of life. It is highly prevalent worldwide, with varying rates across different regions. A recent systematic review reported GERD prevalence rates of 18.1-27.8% in North America, 8.8-25.9% in Europe, 2.5-7.8% in East Asia, 8.7-33.1% in the Middle East, 11.6% in Australia, and 23.0% in South America (Yamasaki et al., 2018).

The present study means age of 66.51 years and its distribution across the 60-65, 65-70, and 70+ age groups align with studies focusing on elderly GERD patients. Juna (2016) highlights the increased prevalence of GERD in individuals over 60, particularly in relation to its complications. it also suggests that research on GERD should specifically include geriatric patients, as they are the most affected population. Similarly, Gyawali et al. (2018) emphasize the importance of tailored interventions that consider individual patient characteristics as age related changes and increased comorbidities with advanced age.

The male predominance (57.1%) observed in this study aligns with **Richter** and **Rubenstein (2018)**, who reported a modest male bias in GERD, with a 1.5:1 ratio. This trend is often associated with factors such as higher smoking rates (35.7% in this study) and visceral fat distribution. However, while this study found a slight male predominance, the overall sex distribution in GERD remains variable. **Kahrilas and Shaheen (2018)** highlight that although GERD affects both sexes, differences in prevalence and symptom presentation exist.

The high percentage of married and widowed individuals in this study reflects typical demographic patterns in elderly populations. Marital status plays a crucial role in providing social support, which can significantly influence health outcomes.

The significant percentage of illiterate individuals in this study underscores the importance of addressing health literacy in GERD management. Low literacy levels among the elderly, common in many parts of the world, pose a challenge to effective patient education. This is supported by **Clarrett and Hachem (2018)**, who emphasize the need for tailored educational interventions, particularly in populations with limited literacy.

The high proportion of rural residents and individuals engaged in occupations such as farming, and homemaking is particularly relevant to the studied population. These factors can significantly influence healthcare access and lifestyle habits. Rural populations often face limited access to specialized medical care, which may contribute to delays in diagnosis and treatment of GERD. Additionally, occupational and dietary habits in these settings could impact disease prevalence and management.

The study findings indicate a significant percentage of overweight and obese individuals, reinforcing the well-established link between obesity and GERD. This aligns with research by **EI-Serag and Sweet** (2014), which emphasizes the role of obesity in exacerbating GERD symptoms and complications due to increased intraabdominal pressure.

Additionally, the high prevalence of chronic diseases among the study participants is consistent with findings in elderly GERD patients. **Gyawali et al. (2018)** highlights the necessity of considering comorbidities in GERD diagnosis and management, as these conditions can complicate treatment strategies and impact patient outcomes. The low percentage of patients with a previous GERD history and the high percentage with recent onset may indicate underreporting or altered symptom presentation in the elderly. Older adults often experience atypical GERD symptoms. This aligns with research suggesting that GERD symptoms in elderly populations are frequently misattributed to other comorbid conditions, contributing to late recognition and management.

The relationship between BMI and GERD is well-documented. Clarrett and Hachem (2018) indicate that a higher BMI is associated with increased GERD symptoms. This study also highlights a significant percentage of overweight and obese patients, reinforcing the established link between obesity and GERD. Excess weight raises intra-abdominal pressure, which can exacerbate symptoms. Additionally, the effectiveness of lifestyle modifications in managing GERD symptoms. The present study strongly supports this, demonstrating that patient education plays a crucial role in GERD management. The significant improvements in lifestyle behaviors posteducation highlight the effectiveness of the intervention. These findings suggest that targeted educational programs can lead to sustained symptom relief and improved quality of life for elderly GERD patients.

The results show a significant improvement in GERD knowledge scores post-education, which is a strong positive finding. Educational interventions have been shown to be effective in enhancing patient understanding of chronic conditions, and this study reinforces that.

Furthermore, the study illustrates a significant decrease in GERD symptom frequency after education, highlighting that improved knowledge translates to better symptom management. The observed positive changes in lifestyle and home remedy practices—such as reducing fast eating, avoiding spicy foods, and not lying down after meals—demonstrate that education led to practical behavioral modifications. Additionally, the substantial improvement in GERD-HRQL scores reflects a better quality of life for patients. This is a crucial finding, as GERD can significantly impair daily activities.

The negative correlation between knowledge and HRQL before and after education, along with the positive correlation between GERD-HRQL and GERD symptoms, aligns with logical expectations. Increased knowledge contributes to a better quality of life, whereas more severe symptoms lead to a lower HRQL.

Lastly, the demographic impact on knowledge, symptoms, and HRQL (as shown in Table 6) is notable. Educational level, occupation, sex, and marital status significantly influenced baseline knowledge before education, suggesting that these factors should be considered when designing educational programs. The finding that educational level and occupation significantly impacted symptom frequency post-education indicates that these factors influence a patient's ability to implement symptom-reducing behaviors after receiving education.

## Conclusion

Educational intervention led to significant improvements GERD in knowledge, symptom frequency, quality of life, and lifestyle modifications. These findings highlight the effectiveness of patient in managing education GERD and enhancing overall well-being.

## Recommendations

- Increase awareness about GERD among high-risk elderly patients to promote early detection and management.
- Implement educational programs focusing on weight loss and smoking cessation for obese and smoking GERD patients, respectively.
- Encourage lifestyle modifications such as avoiding late evening meals

and elevating the head of the bed to manage nocturnal GERD effectively.

 Provide educational handouts with a prioritized list of dietary restrictions and suitable alternative food options for better adherence to dietary modifications.

Table (1): Personal data and health history for patients with gastro esophageal re	eflux
diseases (n=70)	

Variables	No	%
Age group		
From 60 to less than 65 years	40	57.1
From 65-70 years	17	24.3
More than 70 years	13	18.6
Mean±SD (range)	66.51±7.6	60-95)
Sex		
Male	40	57.1
Female	30	42.9
Marital status		
Married	41	58.6
Widow	28	40.0
Divorce	1	1.4
Educational level		
Illiterate	31	44.3
Read and write	13	18.6
Primary	9	12.9
Preparatory	3	4.3
Secondary	2	2.9
University	10	14.3
Postgraduate	2	2.9
Occupation		
Farmer	17	24.3
Housewife	29	41.4
Retired	18	25.7
Trades- business	6	8.6
Residence		
Rural	40	57.1
Urban	30	42.9
BMI	•	
Under weight	3	4.2
Normal Weight	23	32.9
Overweight	28	40.0
Obese	16	22.9
History of chronic illness		
Hypertension	18	25.7
Diabetes Mellitus	25	35.7
Gastrointestinal diseases	9	12.9
Kidney disease	2	2.9

Liver diseases	5	7.1					
Heart diseases	7	10.0					
Respiratory diseases	10	14.3					
Non	12	17.1					
Smoking							
No	45	64.3					
Yes	25	35.7					
Previous history of gastro esophageal reflux disease							
No	66	94.3					
Yes	4	5.7					
Onset of disease							
Less than 1 year	55	78.6					
From 1-3 years	8	11.4					
More than 3 years	7	10.0					



Figure (1): Gastro esophageal reflux diseases knowledge score among patients before and after education (n=70)

Table (2): Gast	tro esophageal reflux dise	ase score of symptoms	s frequency before and after	r
education (n=	70)			

	Max	Befo	re	After		Y0	
	Score	No	%	No	%	~~	F. value
Gastroesophageal Reflux Disease							
Low	<8	1	1.4	62	88.6	107.20	-0.001**
High	≥8	69	98.6	8	11.4	107.59	<0.001
Mean±SD(range)	18	10.83±2.14(6-18)		4.31±2.18(0-19		17.85	<0.001**

Chi square test for qualitative data between the two groups

Paired Sample T-test quantitative data between the two groups

\*Significant level at P value < 0.05, \*\*Significant level at P value < 0.05

## Table (3): GERD-health related change lifestyle and home remedies questionnaire before and after education (n=70)

Itomo	Before		Af	ter	×2	
items	No	%	No	%	~~~	P. value
Fast eating	54	77.1	1	1.4	84.12	<0.001**
Eating beyond fullness	43	61.4	3	4.3	51.80	<0.001**
Preference for spicy foods	49	70.0	5	7.1	58.36	<0.001**
Preference for soup	32	45.7	35	50.0	0.26	0.612
Preference for sweets	44	62.9	1	1.4	60.55	<0.001**
Chronic stress	40	57.1	2	2.9	49.12	<0.001**
Preference for high-fat foods	42	60.0	0	0.0	60.00	<0.001**
Eating too-hot food	48	68.6	0	0.0	73.04	<0.001**
Sleep difficulty	43	61.4	2	2.9	55.05	<0.001**
Lying down soon after eating	50	71.4	0	0.0	77.78	<0.001**
Preference for hard foods	48	68.6	0	0.0	73.04	<0.001**
Preferring spicy food	47	67.1	2	2.9	63.58	<0.001**
Drinking alcohol	0	0.0	0	0.0	0.0	0.0
Drinking strong tea	48	68.6	0	0.0	73.04	<0.001**
Eating just before bedtime	47	67.1	1	1.4	67.08	<0.001**
Difficulty with defecation	51	72.9	2	2.9	72.90	<0.001**
Wearing girdles or corsets	41	58.6	0	0.0	57.98	<0.001**
Drinking coffee	45	64.3	0	0.0	66.32	< 0.001**

	Before		A	fter	¥2		
	No	%	No	%	~~	F. value	
The GERD-HRQL							
questionnaire							
Very Good	0	0.0	4	5.7			
Good	43	61.4	65	92.9	22.60	.0.001**	
Fair	19	27.1	1	1.4	32.00	<0.001	
Poor	8	11.4	0	0.0			
Mean±SD(range)	27.5±10.08(12-60)		10.84±6.6(0-37)		T=11.567	<0.001**	

Table (4): GERD-HRQI	. questionnaire before and	d after education (n=70)
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Chi square test for qualitative data between the two groups Paired Sample T-test quantitative data between the two groups

\*Significant level at P value < 0.05, \*\*Significant level at P value < 0.05

Table (	(5):	<b>Patients</b>	satisfaction	before	and aft	er educ	ation	(n=70)	)
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	Bef	Before		ter	Y2		
	No	%	No	%	~~~	F. value	
Satisfaction with the present condition							
Satisfied	3	4.3	32	45.7			
Neutral	29	41.4	38	54.3	63.24	<0.001**	
Dissatisfied	38	54.3	0	0.0	]		

Chi square test for qualitative data between the two groups

\*Significant level at P value < 0.05, \*\*Significant level at P value < 0.05



Figure (2): Correlation between GERD knowledge and GERD- HRQL

Table (6): Comparison between patient's demographic and medical data before and after education with gastro esophageal reflux diseases knowledge (n=70)

	Gastro esophageal reflux diseases						
Variables	Ν	knowledge					
Variables		Bef	ore	After			
		Mean±SD	Range	Mean±SD	Range		
Age group							
From 60-65 years	40	10.95±7.21	1-27	38.8±4.1	29-46		
From 65-70 years	17	6.53±7.29	0-24	35.94±4.04	27-41		
More than 70 years	13	7.15±8.06	0-24	37.31±5.14	27-48		
Test Used		F= 2.73	P.V=0.072	F=0.10 F	P.V=0.901		
Sex							
Male	40	10.9±7.77	0-27	37.68±5.02	27-48		
Female	30	6.87±6.76	0-27	38.03±3.48	30-46		
Test Used		T=5.16 F	P.V=0.026*	T=0.78 F	P.V=0.379		
Marital status							
Married	41	10.98±7.64	1-27	38.51±4.04	29-46		
Widow	28	6.86±6.81	0-24	36.93±4.84	27-48		
Divorce	1	0±0	0-0	35±0	35-35		
Test Used		F=3.43 F	P.V=0.038*	F=1.16 F	P.V=0.319		
Educational level							
Illiterate	31	6.84±6.63	0-24	36.71±4.23	27-48		
Read and write	13	4.85±4.81	0-14	37.54±3.33	30-43		
Primary	9	11±5.48	5-19	39.44±3.78	34-46		
Preparatory	3	6.33±0.58	6-7	32±5.2	29-38		
Secondary	2	15±11.31	7-23	39±4.24	36-42		
University	10	20.5±4.25	15-27	41.1±4.53	33-46		
Postgraduate	2	7±0	7-7	41±0	41-41		
Test Used		F=9.01 P	.V=0.000**	F=2.46 P	.V=0.033*		
Occupation							
Farmer	17	9.53±7.4	0-24	37.76±4.75	27-48		
Housewife	29	6.38±5.54	0-22	38.21±2.9	34-46		
Retired	18	13.22±9.31	0-27	37.56±5.59	27-46		
Trades- business	6	9.5±6.66	6-23	37±6.32	29-43		
Test Used		F=3.36 F	P.V=0.024*	F=3.56 P	.V=0.019*		
Residence							
Rural	40	7.18±7.11	0-24	37.55±3.3	30-48		
Urban	30	11.83±7.46	0-27	38.2±5.59	27-46		
Test Used		T=7.06 F	P.V=0.010*	T=0.84 F	P.V=0.362		
BMI							
Under weight	3	7±5.2	4-13	38±1.73	36-39		
Normal Weight	23	11.52±8.98	0-27	38.35±5.88	27-48		
Overweight	28	8.54±7.37	0-27	37.75±3.36	30-45		
Obese	16	7.31±5.51	0-17	37.19±4.09	29-43		
Test Used		F=1.22	P.V=0.310	F=2.30 F	P.V=0.085		

- Independent T-test quantitative data between the two groups

One-way Anova T-test quantitative data between the three groups or more

\*Significant level at P value < 0.05, \*\*Significant level at P value < 0.01

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