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Effect of nursing protocol on severity of gastro-esophageal reflux disease symptoms among elderly patients

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Abstract

Background: Gastroesophageal reflux disease (GERD) is a prevalent gastrointestinal disorder among elderly individuals. Aging-related physiological changes and comorbidities may increase symptoms severity.

Aim of the study: To evaluate the effect of nursing protocol on severity of gastro-esophageal reflux disease symptoms among elderly patients.

Research design: A quasi-experimental research design was utilized.

Subjects: A purposive sample of 60 elderly patients diagnosed with GERD.

Setting: Conducted at the outpatient clinics at Minia University Hospital for the liver and digestive system in Minia City, Egypt.

Tools: Two tools were utilized by the researcher for data collection. The first tool is a structured interview questionnaire for demographic and medical data, and the second tool is the Reflux Disease Questionnaire.

Result: There was a significant reduction in the mean score of GERD symptom severity from 2.88±0.527 to1.60±0.542 after 12 weeks of intervention with a highly statistical significance difference ($P \leq 0.01$) was detected between the two groups.

Conclusion: Implementing a designed nursing protocol significantly reduces severity of GERD symptoms among elderly patients.

Recommendation: Integrate Nursing Protocol in GERD Management, and develop Geriatric-Specific Guidelines.

Keywords: Gastroesophageal reflux disease, symptoms severity, nursing Protocol, elderly patients

Introduction

Gastroesophageal reflux disease (GERD) is a chronic upper GI disorder that commonly increases with aging due to age-related changes in the digestive system, such as weakened esophageal muscles and decreased efficiency of the lower esophageal sphincter (LES). This condition allows the regurgitation of gastric contents into the esophagus or extra esophagus, leading to inflammation of the esophageal mucosa. Risk factors associated with GERD may be non-modifiable or modifiable. Non-modifiable factors include age and genetic predisposition to hyperacidity or LES incompetency. Modifiable risk factors related to lifestyle. (Khan *et al*., 2025) [23].

Dietary factors include consuming fat-rich, fried, or spicy foods; drinking citrus juices such as orange or grapefruit juice; and excessive consumption of chocolate, coffee, tea, and carbonated beverages. Irregular meals, large meal volumes, and eating shortly before bedtime may aggravate GERD symptoms. Medications that reduce LES pressure, such as nitrates, calcium channel blockers, and anti-cholinergics, may also contribute. (Shaqran *et al*., 2023) [39].

Clinically, GERD typically manifests with heartburn and regurgitation. In the elderly, it may present atypically with extra-esophageal symptoms such as non-cardiac chest pain, chronic cough, hoarseness, sore throat, dental erosion, belching, vomiting, laryngitis, or asthma. These symptoms present diagnostic challenges due to their non-specific nature and potential overlap with other conditions (Tanvir *et al*., 2024) [41].

Early diagnosis and treatment are particularly important in elderly patients, the diagnosis depend on the clinical presentation, the patient's response to proton pump inhibitor (PPI) trials, and the use of diagnostic procedures. Upper endoscopy is recommended when alarm symptoms such as dysphagia or odynophagia are present. (Ryutina *et al*., 2024) [36].

The management of GERD in the elderly requires a multifaceted approach that includes lifestyle modifications, pharmacologic therapy, and, in selected cases, surgical intervention. Pharmacologic management primarily involves proton pump inhibitors (PPIs), which are considered the most effective agents as they suppress gastric acid secretion, antacids, which neutralize stomach acid and provide rapid symptom relief; H_2 receptor blockers, which reduce acid production; and prokinetic agents, which enhance gastric emptying and improve esophageal motility. (Desai *et al*., 2025) [14].

Dietary modifications and lifestyle changes, when combined with medications, are highly effective in managing GERD symptoms. These non-pharmacological strategies should be considered the first line of treatment. Dietary modification plays a crucial role by reducing symptom frequency and severity through avoiding trigger foods, and promoting healthy eating habits. Likewise, lifestyle modification by maintaining a healthy weight, elevating the head during sleep, avoiding late meals, and reducing smoking and alcohol intake. (Ali *et al*., 2024) [2].

Nursing protocols include lifestyle modifications, patient education, and diaphragmatic breathing (DB) exercises, which are recognized as current complementary therapies. The diaphragm plays a vital role in the antireflux barrier. Recent studies show that DB exercises can enhance crural diaphragm tension, strengthen the diaphragm barrier mechanism, reduce acid reflux symptoms, prevent damage, and improve the effectiveness of drug therapy (Hosseini *et al*., 2022; Zdrhova *et al*., 2023) [18, 43].

Significance of the Study

Gastroesophageal reflux disease is one of the most prevalent and serious health issues worldwide, carrying a risk of significant morbidity and potential mortality due to its complications. It is estimated that approximately 13.98% of the global population is affected by GERD, which equals around 1.03 billion people worldwide (Sadafi *et al*., 2024) [37]. In 2019, the number of global GERD cases reached 783.95 million (Zhang *et al*., 2022) [45]. In the Middle East, GERD prevalence has been reported to range between 8.7% and 33.1% (Al Ghadeer *et al*., 2022) [1].

At Minia University Hospital for Liver and Digestive System, statistics from 2022 revealed that approximately 165 patients were diagnosed with GERD, and nearly 60% of them were elderly (Hospital Records, 2022).

Research on the impact of nursing protocols on GERD symptom severity among elderly patients in Egypt is limited. This study is the first to assess how a nursing protocol influences severity of symptoms. Gerontological nurses play a key role in applying evidence-based practices through health education and elderly care

Aim of the Study

The present study aimed to evaluate the effect of nursing protocol on severity of gastro-esophageal reflux disease symptoms among elderly patients.

Research Hypotheses

H_1: Elderly patients with GERD who will receive and apply the nursing protocol will have a reduction in symptom severity compared to those in the control group who will not.

H_2: There is association between symptom's severity with selected socio-demographic and medical data.

Research Design

A quasi-experimental research design was utilized to fulfill the aim of this study. (Maciejewski, 2018) [26].

Setting

The current study was conducted at the outpatient clinics at Minia University Hospital for the liver and digestive system in Minia City, Egypt.

Subjects

A purposive sample of 60 elderly patients with GERD was assigned in the present study and classified equally into two equal groups. The number of subjects who provide the necessary sample size is determined by the Isaac and Michael (1995) formula, which is computed as (N = n x 30 / 100), in which

N = Sample size.

n = Total number of 100 elderly patients diagnosed with GERD at Minia University Hospital for the liver and digestive system during 2022

N = 100 x 30 / 100 = 30 Patients.

Study group: 30 patients + 30 patients for control group = 60 patients.

Inclusion Criteria

The Study Included Patients Who Had the Following Criteria

1. Elderly patients (60 yrs. and older) diagnosed with GERD.
2. Willing to participate in the study.
3. Both sexes.
4. Patients follow the same medication regimen throughout the study.

Exclusion Criteria

The Study Excluded Patients with the Following Criteria

1. History of upper gastrointestinal surgery.
2. Hiatal hernia.
3. Peptic ulcers, gastric cancer, and severe digestive disorders.
4. Renal failure, liver cirrhosis, severe cardiac disease, rheumatologic diseases, and psychiatric diseases (mental illness and communication disorders).
5. Immobile patients.
6. Elders were treated with avoided medications.
7. Refuse to join the study.

Study Duration

The total data collection took place over a period of 16 months, starting from June 2023 to September 2024.

Tools for Data Collection

Three tools were utilized by the researcher for data collection.

Tool 1: A Structured Interview Questionnaire

The 1st tool was developed by the researcher. It addresses three parts

- **Part 1:** Socio-demographic data such as age, gender, marital status.
- **Part 2:** Past medical data**,** as family history of GERD, how long the patient had been suffering from GERD,

history of chronic disease, smoking.

- **Part 3:** Current medical data, as typical and atypical symptoms of GERD, rhythm of symptoms, and complications of GERD.

Tool 2: Reflux Disease Questionnaire (RDQ)

This tool was adopted from Michael *et al*.. It is used to assess the frequency of the symptoms and the severity of GERD over the past seven days. It consists of 6 questions. It was used at the first visit and with each follow-up at 2, 4, 8, and 12 weeks for both groups. Patients were asked about the following six symptoms: burning behind the breastbone, pain behind the breastbone, upper stomach burning, upper stomach pain, acid taste in the mouth, and movement of materials upwards from the stomach. Scoring system: It was scored using a Likert scale with a choice of six answers: "didn't have," "less than 1 day per week," "1 day per week," "2-3 days per week," "4-6 days per week," and "daily" for each of the six statements.

The total score ranges between 0:30, with a score from 0 to 6 meaning very low frequency of symptoms, a score from 7 to 12 meaning low frequency of symptoms, a score from 13 to 18 meaning moderate frequency of symptoms, a score from 19 to 24 meaning high frequency of symptoms, and finally a score from 25 to 30 meaning very high frequency of symptoms.

The severity is graded as 0, meaning didn't have; 1, meaning very mild; 2, meaning mild; 3, meaning moderate; 4, meaning moderately severe; and 5, meaning severe.

Scoring system: The total score ranges between 0 and 30; a score from 0 to 6 means very mild symptoms, a score from 7 to 12 means mild symptoms, a score from 13 to 18 means moderate symptoms, a score from 19 to 24 means moderately severe symptoms, and finally a score from 25 to 30 means severe symptoms.

Validity and Reliability

To establish content validity, the tools were reviewed by five experts from the departments of medical-surgical nursing and gerontological nursing at the Faculty of Nursing, Minia University. Essential modifications were applied based on their feedback. To assess reliability, Cronbach's alpha model was used as a measure of internal consistency. The RDQ demonstrated a Cronbach's α value greater than 0.80, indicating high reliability.

Pilot Study

A pilot study was conducted on 10% of the total sample (6 patients) to test the feasibility of the study and the applicability of the data collection tool. Since no major modifications were required, these patients were included in the final study sample.

Ethical Consideration

The study was conducted after obtaining official approval from the Ethical Committee of the Faculty of Nursing and the Ethical Committee in Minia University Hospital for the liver and digestive system hospital. Oral informed consent for voluntary participation was obtained by the researcher from each patient and their relatives.

Confidentiality and privacy were strictly maintained. Patients were informed that participation was voluntary and that they had the right to withdraw at any time without providing any justification. Anonymity was ensured through coding of all data and secure storage of the collected information. The purpose, procedures, benefits, and nature of the study, as well as the follow-up plan, were clearly explained to the patients and their caregivers.

Study Procedure

1. **Tool Development:** Data collection tools were developed, validated by experts, and approved by the responsible authorities. A nursing educational booklet was prepared in simple Arabic language.
2. **Data Collection:** Patients meeting inclusion criteria were recruited from Minia University Hospital outpatient clinics (2days per week, about 3-5patients daily).
3. **Initial Assessment:** Baseline data were collected for both groups starting with control group, using the two tools to assess severity of symptoms.
4. **Implementation:** The control group received routine outpatient instructions and prescribed treatment while study group received prescribed treatment and the designed nursing protocol through four educational sessions. The session plan was designed according to the attention span of elderly patients, who were divided into small groups of 3-5 participants for each educational session. Each session lasted 10-15 minutes and was supported by illustrated booklets and instructional videos.

The four sessions are the following:

I. Overview of GERD such as definition, risk factors, and complications.

II. Life style modifications including the avoidance of foods that may precipitate reflux episodes and heartburn, weight loss for overweight patients, smoking cessation, stress reduction, avoiding large meals, eating smaller and more frequent meals, and refraining from strenuous activities after eating (Johnson *et al*., 2023) [21].

III. :*Nursing instructions* Patients were advised to raise the head of the bed by 4-inches and remain upright for 2 6-hours after meals 3,eat at least 3 hours before bedtime, prevent constipation, avoid tight clothing, and bend at the knees instead of the waist when lifting .objects*T*aking acid-suppressive drugs 30-minutes 60 before meals, avoiding tablet crushing, and steering clear of medications like aspirin and ibuprofen, using acetaminophen if needed. (Sibon*iet al* Katz ;2021 ,.*et al*2022 ,.) [40, 22]

IV. The practical session focused on demonstrating and practicing diaphragmatic breathing exercises. Patients performed these exercises for 12 weeks, days per 3 week and 3-times daily, with each session lasting 4 approximately 5-minute 15.

5. **Follow-up:** Patients were monitored biweekly for 12 weeks and contacted by phone three times per week to assess adherence to the protocol by using compliance follow-up sheet. Patients who failed to follow the instructions were excluded from the study.
6. **Evaluation:** Data were collected at baseline and at 2, 4, 8, and 12 weeks to evaluate changes in GERD symptoms.
7. **Post-study:** Control group received the educational booklet after study completion.

8. **Data analysis**: Determined the nursing protocol's effectiveness in reducing GERD symptom severity among elderly patients.

Results

Table 1: Frequency and percentage distribution of socio-demographic characteristics of studied groups (n=60)

Socio-demographic Characteristics	Control (n=30)		Study (n=30)	
	N	%	N	%
Age category				
60:64	14	46.7	19	63.3
> 64:69	13	43.3	11	36.7
> 69	3	10.0	0	0
Mean ± SD	65.33±2.92		64.06±2.74	
Gender				
Male	13	43.3	11	36.7
Female	17	56.7	19	63.3
Marital status				
Single	0	0	2	6.7
Married	22	73.3	22	73.3
Widow	7	23.3	6	20
Divorced	1	3.3	0	0
Residence				
Rural	20	66.7	17	56.7
Urban	10	33.3	13	43.3
Educational level				
Illiterate	11	36.7	9	30
Read and write	13	43.3	10	33.3
Secondary school or diploma	5	16.7	9	30
University graduate	1	3.3	2	6.7
Employment status				
Free work	3	10.0	5	16.7
Housewife	15	50.0	18	60
Retired	7	23.3	6	20
Farmer	5	16.7	1	3.3

Table 1: Shows that (46.7% and 63.3%) of control and study group respectively aged from 60 to 64 years, the highest percentage among them were female as presented with (56.7% and 63.3%) respectively, 73.3% of the control and study group were married. (66.7% and 56.7%) from the control and the study group respectively lived in rural areas. In addition, (43.3% and 33.3%) of them could read and write, furthermore (50% & 60%) of control and study group were housewife. With no statistical significance between the two groups regarding their socio-demographic characteristics

Table 2: Frequency and percentage distribution of past medical data of studied groups (n=60)

Past Medical data	Groups				Sig test	P value
	Control (n=30)		Study (n=30)			
	N	%	N	%		
Family History of GERD						
Yes	16	53.3	17	56.7	0.067	0.795 Ns
No	14	46.7	13	43.3		
How long have you been suffering from GERD?						
6 month	4	13.3	6	20.0	4.23	0.265 Ns
>6 M- <1 yrs.	5	16.7	9	30.0		
>1- < 5 yrs.	14	46.7	13	43.3		
>5 yrs.	7	23.3	2	6.7		
Type of chronic disease						
Hypertension	9	30.0	10	33.3	3.64	0.416 Ns
Diabetes mellitus	7	23.3	3	10		
D.M&HTN	6	20.0	6	20.0		
BMI (KG/M2						
Underweight	6	20.0	4	13.3	1.45	0.727 Ns
Normal	8	26.7	11	36.7		
Overweight	15	50.0	13	43.3		
Obese	1	3.3%	2	6.7		
Smoking						
Never- smoker	21	70.0	24	80	0.800	0.371 Ns
Smoker	9	30.0	6	20		
Alcohol consumption						
No	30	100	30	100	……	

Ns: not significant

Table 2: Reveals that (53.3% and 56.7%) of control and study group respectively had a family history of GERD, (46.7% and 43.3%) of them suffered from GERD from 1 to 5 years, (30% & 33.3%) of control and study group respectively had hypertension, (50% and 43.3%) of them were overweight. In addition, (70% and 80%) of control and study group respectively were nonsmoker,100% of the two groups not alcoholic. With no statistical significance between the two groups regarding their past medical data.

Table 3: Frequency and percentage distribution of study sample regarding type of symptoms, rhythm and complications. (n= 60)

Type of Symptoms	Pre				Post 2 week				Post 4 week				Post 8 week				Post 12 week			
	Control (n=30)		Study (n=30)		Control (n=30)		Study (n=30)		Control (n=30)		Study (n=30)		Control (n=30)		Study (n=30)		Control (n=30)		Study (n=30)	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Typical Symptoms of GERD	**(n= 12)**		**(n= 13)**		**(n= 19)**		**(n= 10)**		**(n= 21)**		**(n= 11)**		**(n= 20)**		**(n= 10)**		**(n=21)**		**(n= 10)**	
Heartburn	8	66.7	9	69.2	7	36.8	7	70	16	76.1	7	63.6	18	90	6	60	15	71.4	6	60
Regurgitations	3	25.0	4	30.8	4	21.1	2	20	4	19.1	4	36.4	2	10	4	40	6	28.6	4	40
Both	1	8.3	0	0	8	42.1	1	10	1	4.8	0	0	0	0.0	0	0	0	0	0	0
X^2 (P value)	1.16 (1.000)				7.73 (0.018*)				3.52 (0.148)				5.09 (0.044*)				8.46 (0.035*)			
Atypical Symptoms of GERD	**(n= 18)**		**(n= 17)**		**(n= 17)**		**(n= 11)**		**(n= 17)**		**(n= 11)**		**(n= 20)**		**(n= 10)**		**(n= 19)**		**(n= 10)**	
Chest pain	9	50.0	11	64.7	11	64.7	9	81.8	11	64.7	9	81.8	12	60.0	10	100	9	47.4	10	100
Chronic cough	2	11.1	4	23.5	3	17.6	2	18.1	2	11.8	2	18.1	2	10.0	0	0.0	3	15.8	0	0.0
Hoarseness	0	0.0	0	0.0	0	0.0	0	0.0	1	5.9	0	0.0	3	15.0	0	0.0	2	10.5	0	0.0
Belching	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	5.0	0	0.0	3	15.8	0	0.0
Nausea & Vomiting	0	0.0	2	11.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chest pain &hoarseness	5	27.8	0	0.0	1	5.9	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Odynophagia	2	11.1	0	0.0	2	11.8	0	0.0	3	17.6	0	0.0	2	10.0	0	0.0	2	10.5	0	0.0
X^2 (P value)	1.96 (0.137)				2.41 (0.429)				2.41 (0.429)				7.26 (0.123)				8.26 (0.210)			
Rhythm of Symptoms																				
Diurnal	5	16.7	3	10	11	36.7	18	60	18	60.0	20	66.7	23	76.7	1	3.3	24	80	0	0.0
Nocturnal	13	43.3	17	56.7	16	53.3	5	16.7	3	10.0	5	16.7	3	10.0	21	70	6	20	8	26.7
Both	12	40.0	10	33.3	0	0.0	0	0	7	23.3	1	3.3	4	13.3	8	26.7	0	0	10	33.3
Disappeared symptoms	0	0.0	0	0.0	3	10.0	7	23.3	2	6.7	4	13.3	0	0.0	0	0	0	0	12	40.0
X^2 (P value	0.661 (0.777)				8.96 (0.011*)				5.67 (0.122)				6.92 (0.032*)				15.3 (0.001**)			
Complications																				
No	25	83.3	24	80	25	83.3	25	83.3	25	83.3	25	83.3	25	83.3	25	83.3	25	83.3	25	83.3
Esophagitis	2	6.7	2	6.7	2	6.7	1	3.3	2	6.7	1	3.3	2	6.7	1	3.3	2	6.7	1	3.3
Sinusitis	1	3.3	3	10	1	3.3	3	6.7	1	3.3	3	10	1	3.3	3	10	1	3.3	3	10
Asthma	2	6.7	1	3.3	2	6.7	1	6.7	2	6.7	1	3.3	2	6.7	1	3.3	2	6.7	1	3.3
X^2 (P value)	1.75 (0.774)				1.79 (0.775)				1.79 (0.775)				1.79 (0.775)				1.79 (0.775)			

* P value is statistical significant

Table 3: Shows a significant differences between the two groups in typical GERD symptoms, as heart burn reported in 66.7% and 69.2% of the control and study group respectively at pretest, after 12 weeks this percentage declined to 60% in the study group compared to the control group, as well as in the rhythm of symptoms, symptoms had completely disappeared in 40% of patients in the study group. However, no significant differences were observed between the groups regarding atypical symptoms or complications from pre- to post-intervention.

Table 4: Frequency and percentage distribution of total score of symptoms frequency and severity regarding RDQ pre and post-intervention among study sample (n= 60)

GERD symptoms Frequency	Pre				Post 2week				Post 4week				Post 8week				Post 12 week			
	Control (n=30)		Study (n=30)		Control (n=30)		Study (n=30)		Control (n=30)		Study (n=30)		Control (n=30)		Study (n=30)		Control (n=30)		Study (n=30)	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
GERD Symptoms Frequency																				
Very Low Frequency	0	0	0	0	6	20.0	8	26.7	6	20	12	40	7	23.3	19	63.3	7	23.3	21	70
Low Frequency	3	10.0	0	0	13	43.3	12	40	12	40	16	53.3	12	40.0	6	20	9	30.0	1	3.3
Moderate Frequency	12	40.0	18	60	10	33.3	10	33.3	9	30	2	6.7	10	33.3	5	16.7	10	33.3	8	26.7
High Frequency	13	43.3	12	40	1	3.3	0	0	3	10.0	0	0	1	3.3	0	0	3	10.0	0	0
Very High Frequency	2	6.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3.3	0	0
	5.47 (0.087)				0.362 (0.894)				9.51 (0.017*)				10.04 (0.010*)				12.9 (0.004**)			
GERD symptoms Severity																				
Very Mild	0	0	0	0	6	20.0	8	26.7	5	16.7	8	26.7	5	16.7	4	13.3	5	16.7	4	13.3
Mild	3	10	2	6.7	16	53.3	17	56.7	13	43.3	20	66.6	11	36.7	21	70	8	26.7	16	53.3
Moderate	12	40	18	60	8	26.7	5	16.7	11	36.7	2	6.7	14	46.6	5	16.7	12	40	10	33.4
Moderately Severe	13	43.3	10	33.3	0	0	0	0	1	3.3	0	0	0	0	0	0	5	16.6	0	0
Severe	2	6.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5.84 (0.069)				1.02 (0.614)				9.37 (0.015*)				7.46 (0.0.021*)				7.83 (0.043*)			

* P value is statistical significant ** P value is highly statistical significant

Table (4): Demonstrates that the study group receiving the intervention showed a marked and sustained improvement in both frequency and severity of GERD symptoms compared to the control group. Initially, (43.3%) of the study group reported high-frequency symptoms, but this dropped to (0%) after 12 weeks, while severity also shifted mainly to mild level. In contrast, the control group showed little improvement and even some fluctuation in symptom frequency. Statistically significant differences between groups were observed at the 4th, 8th, and 12th weeks (p<0.05), confirming the intervention's effectiveness in both reducing symptom frequency and severity.

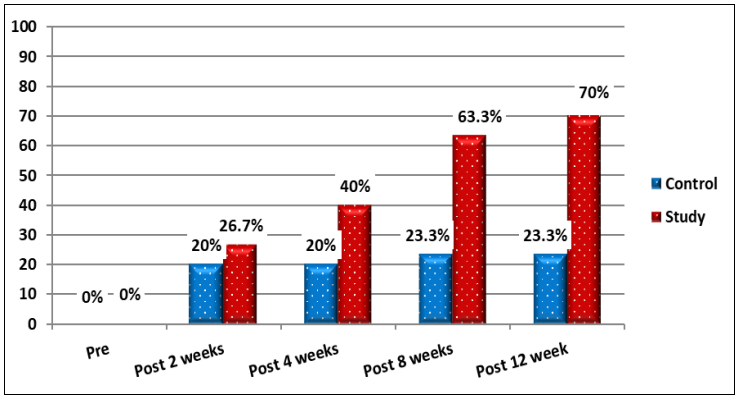

Fig 1: Percentage Distribution of very low frequency of symptoms regarding RDQ Pre and through intervention among Study Sample (n= 60)

Figure (2) shows at the pre-intervention stage, neither group reported very low frequency of symptoms (0%). After 2 weeks, a small proportion appeared in both groups (20% in the control group versus 26.7% in the study group). By 4 weeks, the study group showed a higher percentage (40%) compared with 20% in the control group. This improvement in the study group continued to increase markedly, reaching 63.3% at 8 weeks and 70% at 12 weeks. In contrast, the control group showed only minimal change, remaining nearly static at 23.3% from week 8 to week 12.

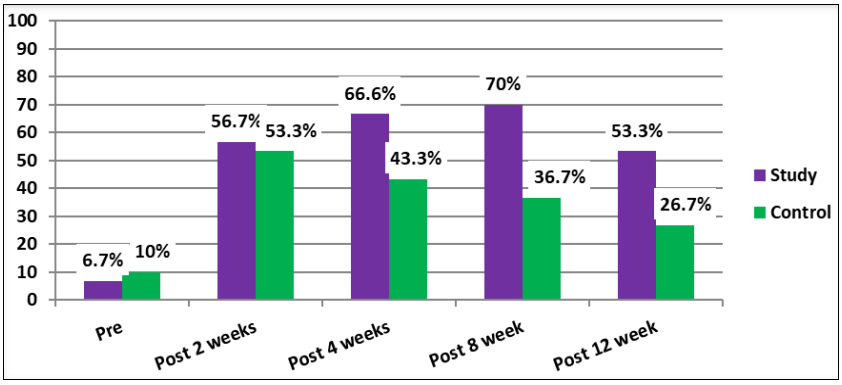

Fig 2: Percentage distribution of mild symptoms severity regarding RDQ Pre and through intervention among study sample (n= 60)

Figure (2) reveals that mild GERD symptoms initially increased in both groups during the early weeks of intervention, peaking at 70% in the study group versus 36.7% in the control group at week 8. However, by week 12, mild symptoms markedly declined to 26.7% in the control group, while they remained relatively high in the study group (53.3%), indicating a significant positive impact of the intervention.

Table 5: Relation between studied patients' socio-demographics and their total score of GERD severity of symptoms (n=60)

Socio-demographic characteristics	Pre		Post	
	Control (n=30)	Study (n=30)	Control (n=30)	Study (n=30)
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Age category				
▪ 60:64	3.78±0.699	3.26±0.561	2.57±1.08	2.15±0.688
▪ > 64:69	3.53±0.518	3.27±0.646	2.46±0.877	2.27±0.646
▪ > 69	3.33±0.577	3.26±0.583	3.00±1.00	……
F (P value)	0.135 (0.874) Ns		0.852 (0.432) Ns	
Gender				
▪ Male	3.61±0.650	3.18±0.404	2.53±0.967	2.00±0.632
▪ Female	3.64±0.606	3.31±0.671	2.58±1.00	2.31±0.671
F (P value)	0.113 (0.738) Ns		0.466 (0.489) Ns	
Marital status				
▪ Single	..	3.50±0.707	..	2.00±0.00
▪ Married	3.68±0.646	3.18±0.501	2.63±0.953	2.13±0.639
▪ Widow	3.57±0.534	3.50±0.836	2.57±0.975	2.50±0.836
▪ Divorced	3.000±0.500	3.50±0.836	1.000±0.00	2.50±0.664
F (P value)	0.268 (0.848) Ns		1.18 (0.323) Ns	
Residence				
▪ Rural	3.70±0.656	3.11±0.485	2.60±0.994	2.11±0.696
▪ Urban	3.50±0.527	3.46±0.660	2.50±0.971	2.30±0.630
F (P value)	0.076 (0.748) Ns		0.003 (0.955) Ns	
Educational level				
▪ Illiterate	3.41±0.668	3.44±0.726	2.33±0.887	2.33±0.707
▪ Read and write	3.75±0.452	3.30±0.483	2.75±1.05	1.77±0.666
▪ Secondary school or diploma	3.80±0.836	3.00 ±0.5000	2.60±1.14	2.00±0.00
▪ University graduate	4.000± 0.005	3.50±0.707	3.00±0.00	2.20±0.664
F (P value)	0.516 (0.608) Ns		1.34 (0.270) Ns	
Employment status				
▪ Free work	3.66±0.577	3.20±0.447	3.33±1.15	2.00±0.707
▪ Housewife	3.73±0.593	3.38±0.607	2.66±0.975	2.38±0.607
▪ Retired	3.71±0.487	3.000±0.632	2.28±0.951	1.66±0.516
▪ Farmer	3.20±0.836	3.000± 0.224	2.20±0.836	3.00±0.00
F (P value)	0.750 (0.527) Ns		1.23 (0.307) Ns	

Ns: not significant

Table (5): Shows a non-statistical significant relation between GERD severity of symptoms among studied patients and their socio-demographic characteristics pre and post intervention

Table 6: Relation between studied patients' medical data and their total score of GERD severity of symptoms (n=60)

Past Medical data	Pre		Post	
	Control (n=30)	Study (n=30)	Control (n=30)	Study (n=30)
	Good	Poor	Mean ± SD	Mean ± SD
Family History of GERD				
Yes	3.75±0.577	3.29±0.469	2.62±0.885	2.29±0.685
No	3.50±0.650	3.23±0.725	2.50±1.09	2.07±0.640
F (P value)	0.801 (0.374) Ns		0.516 (0.475) Ns	
How long have you been suffering from GERD?				
6 month	3.50±0.577	3.16±0.408	2.25±0.957	2.50±0.957
>6 M- <1 yrs.	3.20±0.836	3.22±0.440	1.80±0.836	1.80±0.836
>1- < 5 yrs.	3.71±0.468	3.23±0.725	2.71±0.913	2.17±0.913
>5 yrs.	38.5±0.690	4.00±0.00	3.00±1.00	3.00±1.00
F (P value)	2.56 (0.063) Ns		2.16 (0.103) Ns	
Type of chronic disease				
Yes	3.54±0.670	3.31±0.477	2.59±1.00	2.36±0.597
No	3.87±0.353	3.18±0.750	2.50±0.925	1.90±0.700
F (P value)	0.040 (0.843) Ns		0.449 (0.772) Ns	

BMI (KG/M2				
Underweight	3.00±0.632	3.25±0.500	2.16±1.16	2.00±0.00
Normal	3.87±0.353	3.09±0.700	2.75±0.707	1.81±0.750
Overweight	3.73±0.593	3.46±0.518	2.53±0.990	2.53±0.518
Obese	4.00±----	3.00±0.000	4.00±….	2.50±0.707
F (P value)	1.90 (0.131) Ns		1.51 (0.221) Ns	
Smoking				
Never- smoker	3.57±0.676	3.25±0.607	2.52±0.980	2.20±0.721
Smoker	3.77±0.440	3.33±0.516	2.66±1.00	2.16±0.408
F (P value)	1.76 (0.164) Ns		0.192 (0.663) Ns	

Ns: not significant

Table (6): Reveals a non-statistical significant relation between GERD severity of symptoms among studied patients and their medical data pre and post intervention.

Discussion

Gastro-esophageal Reflux Disease is a common, chronic gastrointestinal disorder, it significantly impairs QOL and can lead to multiple complications. GERD places a significant financial strain on healthcare systems globally, with annual expenditures in the United States alone reaching about $10 billion for its diagnosis and management. (Wickramasinghe & Devanarayana, 2025) [42].

Traditional treatment modalities for GERD include pharmacological therapy, surgical interventions, and endoscopic procedures. However, each of these approaches carries inherent limitations and potential side effects, which has led to increasing interest in complementary and alternative therapies (CATs) to support or enhance conventional GERD management. (Davis & Gyawali, 2024) [13].

Diaphragmatic breathing exercises have emerged as a promising non-invasive intervention. These exercises are thought to reduce the frequency of transient LES relaxations and promote gastric emptying, both of which contribute to symptom relief and improved esophageal function. (Niu *et al*., 2024) [33].

To test our hypothesis, we implemented nursing protocol in a group of patients with GERD (study group) over a 12-week period. The results demonstrated a clinically meaningful reduction in reflux symptoms severity, along with a significant improvement in QOL in the study group compared to the control group.

Regarding The Socio-Demographic and Medical Data of the Studied Sample

According to the current study's findings, the study and control groups' mean ages almost the same, at 64.06±2.74 years and 65.33±2.92 years, respectively. This can be explained as people age, the LES weakens, esophageal motility declines, and gastric emptying slows, these changes reduce the ability to prevent and clear refluxed acid making GERD more frequent and severe in older adults. This result align with Ghayth *et al*. (2025) [17] who reported that means age of elderly patients with GERD is 66.51 years

The gender distribution in this study indicated that more than half of the participants were female. Estrogen plays a protective role in maintaining esophageal integrity and regulating the LES; therefore, following menopause, declining estrogen levels may contribute to increased LES relaxation Scheese *et al*. (2023) [38], according to researchers, in Arab rural communities, elderly women often lead low-activity lifestyles, experience abdominal weight gain, and consume reflux-triggering foods or lie down soon after meals (behaviors that can exacerbate GERD symptoms). (Chu *et al*., 2025) [12].

This point is supported by Baraka *et al*. (2025), who found that a significantly higher number of patients were female. On the other hand, Ghayth *et al*. (2025) [17] founded that more than half of studied sample were male.

The high proportion of married patients in our study sample reflects the usual demographic patterns in elderly population, as people aged they need social support, this aligns with findings from Maher Naguib *et al*. (2024) [27], who observed that more than half of patients were married. Conversely, Alsaleem *et al*. (2021) [4] found that more than two-thirds of the study sample were single.

The study found that over half of patients in both groups lived in rural areas, as rural lifestyles characterized by low health literacy, reliance on self-treatment, unhealthy diets, poor sleep habits, and higher rates of smoking or tobacco use. This finding was in concordance with Putra *et al*. (2025) [35], who reported that rural residence and low socioeconomic status were significant risk factors for GERD

In light of the results of the current study, more than one third of studied sample can read an write and about one third of them were illiterate, which may be discussed as Egyptian rural culture in the past did not allow individuals to attend or complete their educational level specially for women. this results align with Ghayth *et al*. (2025) [17] who founded that more than one third of the patients were illiterate.

Findings of the present study showed that more than half of the studied patients were housewives, because more than half of the studied patients were females from rural areas, and also elderly people had retired at the age of sixty in Egypt.

A recent study conducted at Kafrelsheikh University Hospital by Mohamed and El-Shafei (2024) [30] supports the above findings (more than half of the study subjects were married, housewife females, resided in rural areas)

Based on the past medical data, more than half of patients in both groups were had family history of GERD, this can be discussed based on a systematic review and meta-analysis by Peters *et al*. (2021) [34] who demonstrated that, individuals with a first-degree relative with Barrett's esophagus or esophageal adenocarcinoma were significantly more likely to develop these conditions, suggesting a familial clustering that may be due to genetic predisposition. This finding was in complete agreement with Alshaikhi *et al*. (2024) [5], who reported that, more than half of patients have a family history of GERD.

Around half of the studied patients had the disease for more than one year. Based on the researcher's interpretation, GERD is a chronic condition, particularly prevalent in elderly individuals, and is frequently associated with a prolonged symptomatic course. Irfan *et al*. (2025) [19] emphasize that elderly patients often experience long-term GERD symptoms, underlining the chronic and progressive nature of the disease. These results are supported by Naqvi *et al*. (2025) [32], whose results reported that the majority of patients reported having symptoms for over 1 year.

The proportion of patients who had hypertension in both groups is about one third. This finding aligns with Mosa *et al*. (2024) [31], who documented that about a third of the studied patients with GERD suffered from hypertension as a medical disease.

From the researcher's perspective, hypertensive patients are more likely to experience GERD due to shared risk factors as age-related changes (Atherosclerosis), medications like calcium channel blockers that adversely affect LES, and obesity, which lowers the anti-reflux barrier by increasing intra-abdominal pressure. (Bushi, *et al*., 2025) [9]

The study findings reveals that, half and nearly half of the control and study group respectively were overweight, similarly to that, a study done by Khan *et al*., (2024) [23], found that GERD is more common in overweight patients, more than half of patients having a BMI greater than normal. From the researcher's point of view, carrying excess weight (especially around the abdomen) increasing intra-abdominal pressure and weaken the anti-reflux barrier resulting in acid reflux, also Obesity raises the risk of developing a hiatal hernia. (Azer, *et al*., 2024) [6].

The current study results represented that, majority of studied patients of both groups were nonsmokers, as the majority of them were female. These findings agree with Baklola *et al*. (2023) [7], who found that the prevalence of current smokers among the participants is notably low.

Regarding alcohol consumption, all patients in both groups didn't drink alcohol, as we are in an Arab Islamic society that prohibits drinking alcohol; the majority of patients were elderly women who live in rural communities. These findings are not consistent with Sadafi *et al*. (2024) [37], who found that 13.83% of the studied sample drinking alcohol.

The findings of the current study revealed that nearly three-quarters of patients in both the study and control groups experienced heartburn pretest. Posttest, this percentage declined to just over one-third in the study group compared to the control group. This result is consistent with Alqahtani (2025) [3], who reported that the most significant reductions were observed in heartburn symptoms.

The results of the present study demonstrated a statistically significant difference between the two groups in the rhythm of GERD symptoms at 8 and 12 weeks post-intervention compared to the pre-intervention assessment. Moreover, symptoms had completely disappeared in more than one-third of patients in the study group. This finding corroborated the findings of El-Masry, R. A. (2023) [15], who found symptom resolution in 28% of participants after a 12-week follow-up. From the viewpoint of the researcher and in accordance with Zein *et al*.(2023) [44], who stated that commitment to lifestyle changes, DB exercises and nursing instructions leads to effective management of GERD symptom.

Concerning the levels of GERD symptom frequency, at the end of intervention, approximately three quarters of the study group and less than one-quarter of the control group experienced a very low frequency of symptoms, regarding the levels of GERD symptom severity, after the intervention, more than half of the study group and about one-quarter of the control group reported mild symptoms.

These results are also in agreement with Hosseini *et al*. (2022) [18], who found significant differences between pre- and post-intervention in symptom frequency and severity in the experimental group compared with the control group. From the researcher's standpoint, integrating pharmacological agents, such as PPIs, with lifestyle, dietary modifications, and DB exercises, represents the most effective approach to reducing GERD symptoms among patients, as supported by Zein *et al*. (2023) [44]

The present study's finding of no statistically significant relationship between severity of GERD symptoms and socio-demographic characteristics, both before and after the intervention, this result consistent with Lee *et al*. (2025) [25], who similarly reported the absence of such associations, suggesting that factors other than socio-demographic variables such as lifestyle habits may play a more decisive role in determining symptom burden.

The present study's finding of no statistically significant relationship between severity of GERD symptoms and medical date, both before and after the intervention, this result consistent with Mizuta, *et al*. (2022) [29], the lack of a significant relationship between patients' medical data and GERD symptom severity can be explained by the fact that GERD is primarily a symptom-driven condition, shaped by reflux mechanisms, lifestyle, and patient perception rather than comorbid diseases. While chronic conditions may coexist, they do not directly influence reflux pathophysiology.

Conclusion

Implementation of a designed nursing protocol had a positive effect on decreasing severity of GERD symptoms among elderly patients.

Recommendations

Apply the nursing protocol routinely in medical and gastroenterology units, with regular health education sessions on diet, posture, and lifestyle changes.Integrate nursing protocols for GERD management within hospital .quality improvement plans and elderly care programs Provide continuous in-service training programs for nurses on evidence-based nursing interventions related to gastrointestinal diseases among the elderly.Investigate the role of digital nursing interventions, such as mobile health apps and telemonitoring, in improving treatment adherence and symptom control

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