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# Nursing Teaching Scheme on Remedial Compliance and Symptoms among Patients with Gastro-oesophageal Reflux Disease: A Quasi-experimental Study

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## ABSTRACT

**Background:** Gastroesophageal Reflux Disease is among the most common conditions affecting the digestive system. A nursing teaching scheme for gastroesophageal reflux disease patients is important as it provides comprehensive information and guidance to help patients manage their condition effectively. **Objectives:** This study's objective was to evaluate the effect of a nursing teaching scheme on patient compliance and symptoms of gastroesophageal reflux disease. **Methods:** The research design was Quasi-experimental (one group pretest-post-test). A total of 60 patients were chosen as a purposive sample from the AL-Rajhi Liver Hospital's medical outpatient clinics at Assiut University, Egypt. The data was gathered using a structured interview questionnaire, the Mediterranean Diet Adherence Screener, the Morisky Medication Adherence Scale, and the Gastro-oesophageal Reflux Disease Questionnaire. **Results:** The total mean score of medication adherence levels increased from 2.08± 2.09 pre-teaching scheme to 5.88± 1.77 and 7.40±1.09, respectively, at one- and three-months post-teaching scheme, with $p$-value < 0.001 and significant statistical differences. The overall mean score for Mediterranean diet adherence levels significantly improved, rising from 6.97±1.72 before the nursing teaching scheme to 11.15± 1.46 and 12.87± 1.27, respectively, one and three months after the nursing teaching scheme. There was a significant inverse correlation between patient medication compliance and GERD symptoms severity at the one- and three-month post-nursing teaching scheme. **Conclusion:** The study results showed the effectiveness of a nursing teaching scheme in improving patients' compliance and symptoms of gastroesophageal reflux. Therefore, the study recommends the teaching scheme be incorporated as part of the medical management approach.

***Keywords: Gastro-Oesophageal Reflux Disease; Nursing Teaching Scheme; Remedial Compliance***

## INTRODUCTION

Gastroesophageal Reflux Disease (GERD) is among the most common conditions, impacting 8 to 33% of the global population. It can be described by repeated flow back up of stomach contents into the oesophagus, resulting in both oesophageal and extra-oesophageal symptoms (Nunes *et al*., 2024). Heartburn and regurgitation represent the primary clinical indications of GERD, although it can also exhibit additional symptoms beyond the oesophagus, such as asthma, laryngitis, persistent cough, chest discomfort, and dental erosion (Wickramasinghe & Devanarayana, 2025). Untreated GERD can result in complications such as Barrett's oesophagus, oesophageal cancer, and esophagitis (Bains *et al*., 2024). Core treatments for GERD involve the use of anti- reflux medications and adjustments in lifestyle habits. Current research suggests that good dietary practices, such as following the Mediterranean diet (Med Diet) can reduce the symptoms of GERD (Ahmadi Vasmehjani *et al.*, 2025). The Med diet is distinguished by abundant fresh fruits and locally sourced plant-based foods, moderate intake of fish and red wine, limited consumption of red meat and processed foods, and regular use of cold-pressed olive oil as the primary cooking fat (Seelarbokus *et al*., 2024).It has been demonstrated that improving oesophageal acid exposure at night involves avoiding eating for at least two to three hours before recumbency, elevating the head of the bed, and maintaining a left lateral decubitus position. Also, because the diaphragm is a skeletal muscle that is largely controlled by the conscious mind, breathing exercises can help alleviate the symptoms (Zdrhova *et al*.,

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2023). Low compliance with medication and recommended lifestyle changes can worsen symptoms and lower quality of life. According to Pisegna *et al*. (2017), the majority of patients take their proton pump inhibitors (PPIs) incorrectly, confused about which pill is for reflux, and taking them with other medications or food or beverages. Therefore, it is critical to assess treatment compliance and the patient's understanding of GERD medication and its use, including the prescription's name, dosage instructions, and regimen.

A nurse's role in patient teaching is vital and multifaceted. Nurses have a unique opportunity to develop interventions that can improve patients' compliance with their educational needs. They can also educate and communicate with patients who have a range of problems (Sheta *et al*., 2024). Teaching is defined as demonstrating, instructing, leading, or teaching clients, families, patients, or students (Fernando *et al*., 2022). In this study, the nursing teaching scheme for gastroesophageal reflux disease patients is important as it provides comprehensive information and guidance to help patients manage their condition effectively.

Low compliance (LC) with dietary modification and medication is a very common obstacle in GERD management. Therefore, it is important for the patient to learn compliance to avoid complications and relieve symptoms (Yu *et al*., 2024). Regarding medication compliance, most of the research evaluated medication compliance in GERD patients; however, no programme or strategy exists to enhance compliance. Moreover, the majority of the studies emphasise the Mediterranean diet as a risk factor for GERD, but do not emphasise compliance with it and its relationship with the improvement of GERD symptoms (Lakananurak *et al*., 2024). So, this study hoped to improve remedial compliance and symptoms among patients with GERD.

**Objectives**

Evaluate the effect of nursing teaching scheme on patients' compliance and symptoms of gastroesophageal reflux disease.

**Research Hypotheses**

**$H_1$:** The level of medication compliance among patients with GERD will be improved after receiving a nursing teaching scheme than before.

**$H_2$:** The level of Med diet compliance among patients with GERD will be higher after receiving nursing teaching scheme than before.

**$H_3$:** The severity level of GERD symptoms will be decreased after receiving the nursing teaching scheme than before.

**$H_4$:** There will be a significant correlation between the severity of GERD symptoms and compliance to medication and Med diet.

## METHODOLOGY

**Research Design**

A Quasi- experimental research design (one group pretest- post-test) was used in this study.

**Setting**

The study was carried out at the AL-Rajhi Liver Hospital's outpatient clinic at Assiut University.

**Sample**

In this research study, a purposive sample included of 60 individuals was used.

**Inclusion Criteria**

Patients age ranged from 20 to 65 years

Patients exhibiting typical symptoms of GERD, such as experiencing heartburn and acid regurgitation, for more than 4 weeks, which may accompany atypical symptoms such as hoarseness, sore throat, bloating, belching, dysphagia, and vomiting

Patients were willing to participate in the study

**Exclusion Criteria**

The presence of gastrointestinal cancer or peptic ulcers

Pregnancy

The presence of a significant concurrent condition (such as uraemia and decompensated liver cirrhosis)

Patients with a history of oesophageal or stomach surgery

**Sample Size**

The overall number of GERD patients attending the outpatient clinic in the previous 6months from November 2022 to April 2023 was 425. The sample size was calculated using "Epi Info" version 7.2 with a confidence level of 99% and a confidence limit of 5%, the calculated sample size was 203.The nursing teaching scheme applied to 25% of this sample (51) and increased to 60 to avoid dropout and refusal.

**Tools of Data Collection**

**Tool I:** Patient's interview questionnaire: It was developed by the researcher using pertinent literature (Isshi *et al*., 2021; Mosa *et al*., 2024). It consists of two parts:

**Part (1):** Patient personal data as age, gender, education level, occupation, and marital status.

**Part (2):** Medical characteristics as duration of illness, body mass index, history of smoking, and history of non-steroidal anti-inflammatory use.

**Tool II: Morisky Medication Adherence Scale (MMAS):**

It was adopted from Morisky, Green & Levine (1986) and evaluates subjects' reported adherence to medication. It consists of 8 questions Yes/No statements regarding past medication usage behaviours, making it a convenient tool for drug history assessments. The scoring system involves assigning zero points for positive responses and one for negative responses for questions 1, 2, 3, 4, 6 and 7. Conversely, for question 5, zero points are given for a negative response and one for a positive response. Question 8 utilises a five-point Likert scale, with a point of one for "Never/Rarely" and zero for "Once in a while/Sometimes/Usually/All the time". Those subjects with a point of (8) were considered High adherence, medium adherence (point of 6 to < 8), and Low adherence (point of < 6). **Tool III: Mediterranean Diet Adherence Screener (MEDAS) questionnaire.** Developed by Schröder *et al.* (2011), this validated 14-item food consumption questionnaire assesses the intake of 12 key components and two dietary patterns associated with the Mediterranean diet. Each item is assigned a score of 1 or 0 based on whether the subjects adhere (1 point) or do not adhere (0 points) to each aspect of the Mediterranean diet. Individuals scoring ≤5 points are categorised as mildly adherent, those scoring 6-9 points are considered moderately adherent, and those scoring ≥10 points are classified as highly adherent to the Mediterranean diet. **Tool IV: Gastro-oesophageal Reflux Disease Questionnaire.** Developed by Jones *et al*. (2009), this consisted of 6 enquiries covering the frequency of heartburn, regurgitation, epigastric discomfort, nausea, sleep disruption, and the use of counter medications to alleviate symptoms. A cumulative GERD score spanning from 0 to 18 was calculated utilising a reverse Likert scale (3-0) for two adverse indicators (epigastric discomfort and nausea) and a four-point Likert scale (0-3) for four positive indicators of GERD (heartburn, regurgitation, sleep disturbances, and the use of counter medications).The scoring system assigns a point value between 0 and 18; the higher the number, the higher the probability that the patient suffered from GERD symptoms. - From 0 to 2 scores, the patient either had no GERD or a 0% chance of developing GERD symptoms. - From 3 to 7 points, the patient had a 50% chance of having mild GERD symptoms. - From 8 to 10 points, the patient had a 79% chance of having mild or moderate GERD symptoms. - From 11 to 18 points, there is an 89 % chance of having GERD or severe GERD symptoms.

**Reliability**

The Alpha Cronbach test was used to assess the internal consistency of the instruments' stability. It was (0.809) for the Morisky Medication Adherence Scale, (0.725) for the Mediterranean diet Adherence Screener Questionnaire and (0.897) for the Gastro-oesophageal Reflux Disease Questionnaire. Pilot study: conducted on six patients in order to evaluate the proposed tools' applicability and clarity. As a result, the required adjustments were performed. Participants in the pilot study were excluded from the original sample for the study.

**Procedure**

Official written consent was acquired from the director of AL-Rajhi Liver Hospital at Assiut University, outlining the research's objectives. The researcher conducted visits to the hospital's outpatient clinic twice weekly,

from 10:00 a.m. to 12:00 p.m., till the required sample was reached, from early August 2023 to late January 2024, approximately six months. The present research was performed through the application of a nursing teaching scheme which includes the following steps:

**Assessing Learning Needs**

The researcher began collecting data using all study tools to establish initial information regarding socio-demographic features, medical attributes, medication adherence, Mediterranean diet adherence, and GERD symptoms. It took approximately 30-35 minutes to finish assessing these items.

**Setting Learning Objectives**

Based on the assessment, the objective of the first session was to improve patient compliance with medication and Mediterranean. The second session's objective was to provide patients with knowledge and practice that helped to alleviate symptoms of GERD.

**Developing Teaching Materials**

The researcher prepared teaching materials such as brochures and interactive digital resources to facilitate the learning process. The usage of these materials was decided according to the patient's level of understanding, language proficiency, and cultural preferences.

**Delivering Information and Demonstrating Skills**

Two educational sessions concerning GERD were delivered to a patient group at mutually agreed upon dates. Each session lasted approximately 35-40 minutes. Initially, the patients were introduced to the content of the teaching sessions.

**Educational Intervention Provided to Patients by the Researcher in the First Session**

The disease's definition, manifestations, diagnostic tests, complications, and different management modalities (Fass, 2022).

Medication adherence: the researcher provided patients with detailed information about the purpose, dosage, potential side effects, and timing of medication administration as prescribed by their doctor. The researcher instructed patients on strategies to enhance their medication adherence by providing written guidelines and encouraging the use of reminder systems, such as pill medication reminder apps or alarms, to aid in remembering their medication schedules. Also, instructions on how to take the drug and how to spread the dose in the morning and evening, as well as how to take it (30 to 45) minutes before meals (Smith & Davila, 2023). Dietary regimen: Avoid consuming foods that could potentially provoke symptoms (such as acidic foods like those containing citrus or tomatoes and steering clear of fatty meals, soft drinks, chocolate, coffee, tea, and spicy meals) (Fox & Gyawali, 2023) and Mediterranean diet regimen (component of MD, and meal planning) (Guasch-Ferré & Willett, 2021).

**The Second Session Focused on the Following Two Topics**

Practical part is teaching patients diaphragmatic breathing exercises to enhance the diaphragm's anti-reflux defences and strengthen its skeletal muscles. The researcher taught the patient how to do diaphragmatic breathing exercises and instructed him to perform this exercise five days a week and five sessions each day for 15–20 min (Ahamed, Elalem & Mohamed, 2021). Immediately following the researcher's first demonstration of the technique in front of the patients and before requesting them to demonstrate it themselves, the researcher engages in a role-play scenario and records a video of the technique to verify the correct execution of each step. Knowledge about measures to relieve night sleep symptoms of GERD (body posture, elevation of the head of the bed, and meal timing in relation to bedtime). Additionally, instructions about weight management and avoiding toxic habits such as tobacco use and alcohol (Chhabra & Ingole, 2022).

**Providing Written Instructions**

At the conclusion of the sessions, patients were provided with a brochure containing details about GERD

to fulfil the session's goals. Additionally, the researcher reached out to patients via mobile phones for post-tests and follow-up purposes.

### Evaluation and Follow-up

The patients were reassessed two times (after one month and three months) using the same data collection instruments, and then comparisons were done to evaluate improvement in the patient compliance with medication and Med diet and severity of GERD symptoms.

### Statistical Analysis

Data entry and analysis were conducted using SPSS version 22 (Statistical Package for Social Science). Data were summarised using frequency, percentage, mean, and standard deviation. Paired samples *t*-tests were utilised to assess changes between pre-test and post-test quantitative data. The correlation between quantitative variables was evaluated using Pearson correlation analysis. Statistical significance was defined as $P < 0.05$.

### Ethical Consideration

This study received ethical approval from the Faculty of Nursing, Assiut University, Egypt to conduct the study with reference number 1120230626 on 29th May 2023.

## RESULTS

***Table 1: Socio-Demographic Characteristics of the Studied Patients (n = 60)***

| Characteristics | No. | % |
|---|---|---|
| **Age (years)** | | |
| 18 < 40 | 31 | 51.7% |
| 40 < 60 | 24 | 40.0% |
| 60 – 65 | 5 | 8.3% |
| **Mean ± SD (Range)** | **39.63 ± 10.57 (20.0-62.0)** | |
| **Marital Status** | | |
| Single | 11 | 18.3% |
| Married | 44 | 73.3% |
| Divorced | 2 | 3.3% |
| Widow | 3 | 5.0% |
| **Educational Level** | | |
| Illiterate | 13 | 21.7% |
| Read and write | 10 | 16.7% |
| Basic education | 3 | 5.0% |
| Secondary | 19 | 31.7% |
| University | 15 | 25.0% |
| **Occupation** | | |
| Employer | 30 | 50.0% |
| Housewife | 19 | 31.7% |
| Not wok | 11 | 18.3% |

Table 1 shows that the mean age of studied patients was (39.63 ± 10.57) years, with the majority of them (73.3%) being married. While one-third of them (31%) had secondary education, half of them (50%) were employed.

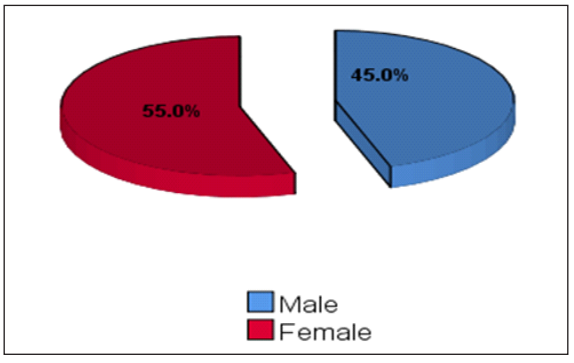


***Figure 1: Patient Distribution Based on Gender***

Figure 1 illustrates that more than half of studied patients (55%) were females.

***Table 2: Medical Characteristics of the Studied Patients (n= 60)***

| | | |
|---|---|---|
| **Duration of Illness** | | |
| <4 months | 10 | 16.7% |
| 4 - 6 months | 8 | 13.3% |
| >6 months | 42 | 70.0% |
| **Body Mass Index (BMI)** | | |
| Underweight | 6 | 10.0% |
| Normal | 15 | 25.0% |
| Overweight | 26 | 43.3% |
| Obese | 13 | 21.7% |
| **Smoking** | | |
| Yes | 18 | 30.0% |
| No | 42 | 70.0% |
| **Duration** | | |
| <5 years | 6 | 33.3% |
| 5 - 10 years | 7 | 38.9% |
| >10 years | 5 | 27.8% |
| **History of Non-Steroidal Anti-Inflammatory Use** | | |
| Yes | 28 | 46.7% |
| No | 32 | 53.3% |

Table 2 reports that the majority of the studied sample (70%) had a duration of illness greater than 6 months. In relation to body mass index, (43.3%) and (21.7%) were overweight and obese. Regarding the history of smoking, 30% of studied patients were smokers, with less than half of them (38.9%) smoking for 5–10 years. Also, a little less than half of them (46.6%) used non-steroidal anti-inflammatory drugs.

***Table 3: Comparison between Levels of Medication Adherence Obtained by GERD Patients Pre, Post and Follow-Up after Application of Nursing Teaching Scheme (n = 60)***

| **Medication Adherence Levels** | **Pre-test** | | **Post-test by 1 month** | | **Post-test by 3 months** | | ***P*-value[1] (Sig.)** | ***P*-value[2] (Sig.)** |
|---|---|---|---|---|---|---|---|---|
| | **No.** | **%** | **No.** | **%** | **No.** | **%** | | |
| **Mild** | 55 | 91.7% | 26 | 43.3% | 4 | 6.7% | | |
| **Moderate** | 5 | 8.3% | 18 | 30.0% | 17 | 28.3% | 0.000 (HS) | 0.000 (HS) |
| **High** | 0 | 0.0% | 16 | 26.7% | 39 | 65.0% | | |
| **Mean ± SD**<br>**Range** | 2.08 ± 2.09<br>0.0-7.0 | | 5.88 ± 1.77<br>1.0-8.0 | | 7.40 ± 1.09<br>2.0-8.0 | | 0.000 (HS) | 0.000 (HS) |

*(*) HS: Highly Significant at P<0.01*

Table 3 confirms that the average score for medication adherence levels rose significantly from 2.08± 2.09 during the pretest to 5.88±1.77 and 7.40±1.09 during the post-tests at one and three months, respectively.

***Table 4: Comparison between Levels of Mediterranean Diet Adherence Obtained by GERD Patients Pre, Post, and Follow-Up After Application of Nursing Teaching Scheme (n = 60)***

| **Mediterranean Diet Adherence Levels** | **Pre-test** | | **Post-test by 1 month** | | **Post-test by 3 months** | | ***P-value[1] (Sig.)*** | ***P-value[2] (Sig.)*** |
|---|---|---|---|---|---|---|---|---|
| | **No.** | **%** | **No.** | **%** | **No.** | **%** | | |
| **Low** | 10 | 16.7% | 0 | 0.0% | 0 | 0.0% | | |
| **Moderate** | 45 | 75.0% | 8 | 13.3% | 1 | 1.7% | | |
| **High** | 5 | 8.3% | 52 | 86.7% | 59 | 98.3% | | |
| **Mean ± SD** | 6.97 ± 1.72 | | 11.15 ± 1.46 | | 12.87 ± 1.27 | | 0.000 (HS) | 0.000 (HS) |
| **Range** | 3.0-11.0 | | 8.0-14.0 | | 8.0-14.0 | | | |

*(*) HS: Highly Significant at P<0.01*

Table 4 reveals significant improvement in the total mean score of Mediterranean diet adherence levels, which increased from (6.97± 1.72) pre-test to (11.15± 1.46) and (12.87± 1.27), respectively, post-test by one and three months, with high statistically significant differences.

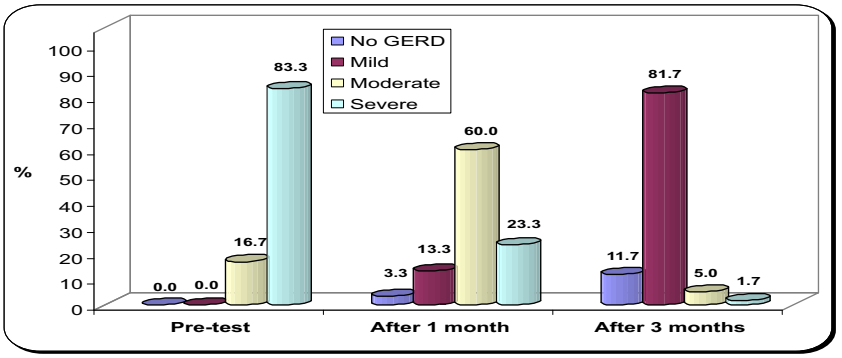


***Figure 2: Severity of GERD Symptoms Obtained by Studied Sample Pre, Post, and Follow-Up after Application of Nursing Teaching Scheme (n = 60)***

Figure 2 shows that the majority of patients had severe GERD symptoms (83.3%) pre-test, while more than half of them had moderate GERD symptoms (60%) post-test by one month, and (81.7%) of patients had mild GERD symptoms post-test by three months.

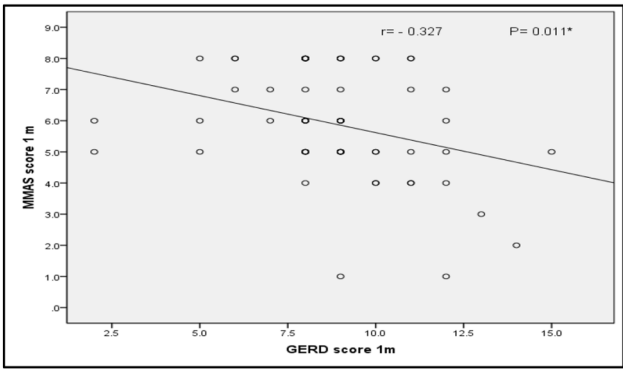


***Figure 3: Correlation between GERD Symptoms Scores and Medication Adherence Score after 1 Month Post Application of Nursing Teaching Scheme***

Figure 3 shows significant negative correlation between gastroesophageal reflux disease symptoms and medication adherence post-test by one month.

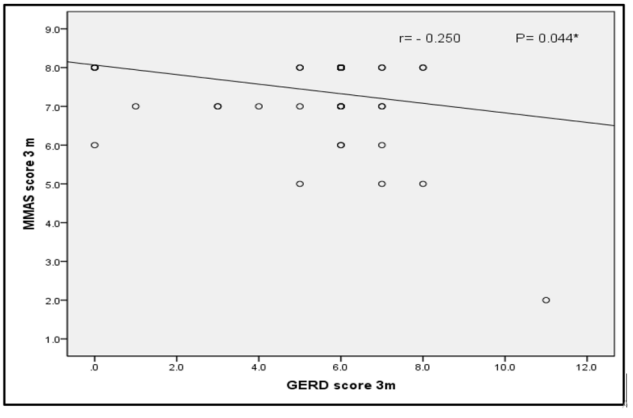


***Figure 4: Correlation between GERD Symptoms Scores and Medication Adherence Score after 3 Months Post Application of Nursing Teaching Scheme.***

Figure 4 reports a significant negative correlation between gastroesophageal reflux disease symptoms and medication adherence post-test by 3 months.

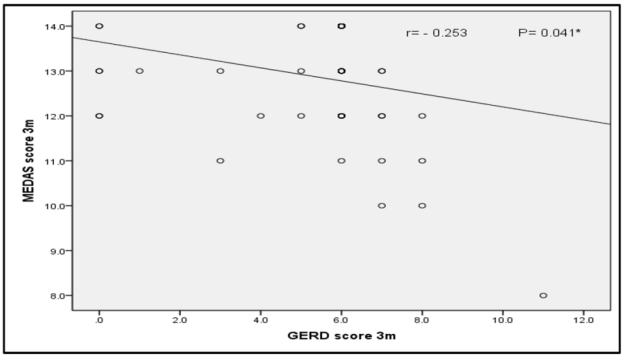


***Figure 5: Correlation between GERD Symptoms Scores and Mediterranean Diet Adherence Score after 3 Months Post Application of Nursing Teaching Scheme***

Figure 5 illustrates that significant negative correlation between gastroesophageal reflux disease symptoms and Mediterranean diet adherence post-test by 3 months.

## DISCUSSION

In terms of the demographic characteristics of the sample, the findings indicated that the age of the participants in this study varied from twenty to sixty-two years, with an average age of 39±10.57 years. This outcome aligns with the research by Hosseini *et al*. (2022), where they reported a mean age of 40.75 years among their participants. This indicates that older persons are more likely to have GERD, which is also supported by Manterola *et al*. (2020), who found that older adults are more likely to have GERD. In terms of gender and marital status, the study findings indicated that most patients were married, with over half of them being females. These results were consistent with the research conducted by Najm & Mohammed (2024), which also observed a predominance of GERD in females, particularly among married individuals. About the level of education and occupation, the results presented that one-third of studied patients had a secondary education, and half of them were employed. These results were consistent with Shrief (2021), who reported that almost all participants were working, and one-third had a secondary education. By looking at the medical characteristics of the studied patients, the study showed that the majority of the studied sample had a duration of illness greater than six months. This was due to the lack of adherence to either medications or dietary modification for most patients. This result is in line with Ahamed *et al*. (2018), who mentioned that more than half of patients had a disease duration of more than six months.

In relation to body mass index, more than half of patients were overweight and obese. A similar finding was also reported by Rasool *et al*. (2021), who found that out of 308 participants, more than half of them were overweight and obese. Regarding the history of smoking, less than half of the studied patients had smoked for five to ten years. This result is consistent with Kariri *et al.* (2020), who reported that less than half of the participants smoked. This indicates that smoking for extended periods of time increases the incidence of oesophageal reflux. About non-steroidal anti-inflammatory drug consumption, a little less than half of patients were using NSAIDs. This might be due to patients needing to decrease heartburn or pain from GERD. The same result was reported by Mosa *et al*. (2024).

The findings discovered that the studied patients had markedly low levels of medication compliance at pre-nursing teaching scheme application. This finding was due to stopping taking proton pump inhibitors (PPIs) after clinical improvement of symptoms by some patients, interrupting of medication due to side effects such as slow gastric emptying. This explanation was consistent with Shrief (2021), who found that over fifty percent of patients did not take their prescription drugs as directed. A possible reason for this may be the lack of awareness about the importance of medication adherence and their fear of the adverse effects of drugs. At the post-nursing teaching scheme stages, statistically significant improvements were shown in the total mean score of medication adherence levels. This came in accordance with Fahimi *et al.* (2021), who reported a significant increase in the mean scores related to medication adherence following the educational intervention in the intervention group, in contrast to the control group. The finding before the nursing teaching scheme application

presented that the majority of studied patients had a moderate level of Med diet adherence. This finding was due to the low intake of red meat, hamburgers, and sausages because of the economic conditions in Egypt and dependence on cereal consumption. On the other hand, their dependence on saturated fats was prevalent, and there was a very low consumption of olive oil and nuts. This finding is congruent with Natalello *et al*. (2024), who reported that the majority of patients with systemic sclerosis had moderate adherence to a Med Diet pattern. Following the implementation of a nursing teaching programme, adherence to the Mediterranean diet changed significantly from moderate during the pre-test to high at one- and three-months post-test, respectively. This finding aligns with the results of Hussein and Mahmoud (2019), who observed significant statistical variances in compliance with dietary recommendations before and after the application of nursing guidelines within their study cohort. On the other hand, the finding analysis showed that the severity of GERD symptoms changed from severe pre-nursing teaching scheme to moderate and mild, respectively, at one- and three-months post-nursing teaching scheme. This is due to the improvement in symptoms typically linked with taking prescribed medications. Furthermore, compliance with brochure instructions, especially the researcher, ascertains the importance of this instruction each follow-up. This study's findings are consistent with those of the study conducted by Ahamed, Elalem & Mohamed (2018), who found that all physical symptoms turned from severe to moderate or mild and that physical symptoms improved significantly at post-tests compared to pre-test scores. According to his interpretation, the physical symptoms improved because of the beneficial effects of the intervention programme, which increased the patient's coping mechanisms by focusing on lifestyle modifications.

Finally, this research established a notable negative correlation between patient adherence to medication and the severity of GERD symptoms following a nursing teaching scheme at one and three months. This outcome aligns with the conclusions drawn by Pisegna *et al*. (2017), suggesting that improved medication adherence correlates with milder disease manifestations and improved or diminished symptoms.

Also, data analysis demonstrated a significant negative correlation between patient Med diet compliance and GERD symptoms severity at the three-month post-nursing teaching scheme. This finding confirms that the patient should adhere to a Med diet for a long period of time to produce an effect on symptoms. The result of our study is consistent with Zhang *et al*. (2021), who found that there was a negative correlation between GERD and vegetarian diets, fruits, vegetables, vitamins, and fibre.

### Limitation

The outpatient clinic lacked a designed room for implementing the nursing teaching scheme, especially among the instructions that the patient learnt how to do deep breathing exercises. So, the research took time to locate an empty room. The researcher did not measure the level of patient satisfaction regarding the nursing teaching scheme.

## CONCLUSION

Based on the results in this study, the implementation of a nursing teaching scheme has proven effective in improving adherence to medication and Med diet regimen among patients with gastroesophageal reflux disease. Additionally, there is a notable reduction in the severity of GERD symptoms following the application of the nursing teaching scheme, suggesting that improved adherence directly impacts symptom alleviation. The study also indicates a negative correlation between adherence levels and the severity of GERD symptoms. This implies that as patient adherence to medication and dietary recommendations increases, the severity of their symptoms decreases. Therefore, it is suggested that integrating this teaching scheme into the medical care strategy by implementing it within an outpatient clinic, along with the distribution of an informational brochure. Future research should focus on replicating the study with a larger and more representative sample. Furthermore, investigating the factors influencing medication adherence and adherence to the Med diet is recommended for further exploration.

### Recommendation

Multidisciplinary collaboration: Promote collaboration among nurses, dietitians, and gastroenterologists to provide a holistic approach to patient education and management, ensuring all aspects of GERD care are

covered. Incorporate Technology: Utilise mobile apps or online resources that can offer ongoing educational content and reminders for medication and lifestyle management customised to GERD patients. Conducting further research to explore the long-term effects of the teaching scheme, including patient satisfaction and quality of life.

**Conflict of Interest**

The authors declare that they have no competing interests.

**ACKNOWLEDGMENT**

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