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Article

Effectiveness of an Educational Program about Stress Management on Patients' Knowledge of Gastroesophageal Reflux Disease

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Abstract: Gastroesophageal reflux disease (GERD) is an umbrella term for a group of heterogeneous pathophysiologic disorders inducing effortless movement of stomach contents into the esophagus, resulting in troublesome symptoms or complications. Objectives of the study are to assess patients' knowledge about stress management with Gastroesophageal Reflux Disease and to evaluate patients' knowledge about stress management with Gastroesophageal Reflux Disease, in addition, to determine the effectiveness of the educational program on patients' knowledge about stress management with gastroesophageal reflux disease. Also, to determine the relationship between patients' knowledge and their socio-demographic and clinical data. Quasi-experimental design was implemented in the present study by assigning patients randomly into two groups (study and control groups) by using pre and post-test procedures for both groups to determine the effectiveness of an educational program. The study started on April 2nd, 2023 until April 1st, 2024. A non-probability (purposive sample) technique was used to select 64 patients and included them in the present study. Data collected through a well-designed questionnaire consists of three parts: Part I: Socio-Demographic Characteristic. part II: Clinical Data and Part III: Patients' Knowledge of Gastroesophageal Reflux Disease Concerning stress management. The findings of the present study indicate that the overall patients' knowledge about stress management after educational program application was good in the study group while in the control group, it was fair at post-test. In addition, there is a non-significant difference in the study group's patients' knowledge at post-test according to their demographic and clinical data, at a p-value of more than 0.05 except level of education was significant at a p-value 0.014. The study concludes that the educational program positively affects patients' knowledge regarding stress management after GERD, and this effect has been proven. The study recommends that nursing education guidelines be prepared and up to date under the supervision of experts from the nursing and education authority for use by the health staff at the Ministry of Health as a standard in managing patients with gastroesophageal reflux disease.

Keywords: Effectiveness, Educational Program, Stress Management, Patient, Knowledge, Gastroesophageal Reflux Disease

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1. Introduction

Gastroesophageal reflux disease (GERD) is an umbrella term for a group of heterogeneous pathophysiologic disorders inducing effortless movement of stomach contents into the esophagus and resulting in troublesome symptoms or complications.(Talley & Zand Irani, 2021), (Boura et al., 2023).

Patient education has been proved to have a positive impact on a variety of chronic diseases and become an important prevention strategy for some diseases (Chen et al., 2022). Raising patients' knowledge about the disease is a key factor in the management of the disease as many precipitating factors of the disease are known and can be easily identified in the patient, hence educational programs to raise patients' awareness level of the disease is necessary. (Maret-Ouda et al., 2020)(Jeong et al., 2017)(Hamed & Shrief, 2021)

Stress is believed to exacerbate GERD symptomatology by increasing resting LES pressure, impairing sphincter relaxation and thus delaying acid clearance from the esophagus. However, while the application of psychological relaxation techniques has led to significant reductions in reported heartburn and duration of esophageal acid exposure. Neurobiological mechanisms are thought to play an important role in the comorbidity of GERD and depression. Stress disrupts the tight junctions of the esophageal epithelium, which weakens the barrier function of the esophageal mucosa. Mental health problems such as anxiety can impair the motor function of the esophagus. This may result in decreased lower esophageal sphincter pressure and esophageal motility disorders.(Özenoğlu et al., 2023)(Vernia et al., 2021) (Kim et al., 2022) (Guadagnoli et al., 2022; Khasal & Atiyah, 2019; Mousa & Mansour, 2020)

Health education and patient teaching are at the heart of nursing practice and a nurse's vital role. Nurses can make significant differences by assisting patients in maintaining health while sharing knowledge with them and their families and explaining practical problems to become able to cope with their illness. Their role also consists of benefiting the public in terms of disease prevention and health promotion, as well as promoting staff nurses' competence and confidence in practice through continuing education activities. (Dumit, 2014) (Isam & Hassan, 2023)

Nurses provide information and educate people in their care. This can increase knowledge and confidence in patients and families facing the challenge of life-limiting illness. Education can enhance the quality of life and symptom management. (Dahlin CM, 2019)

2. Materials and Methods

Design of the Study:

Quasi experimental design was implemented in the present study by which the patients were assigned randomly into two groups (study and control groups) by using pre and post-test procedures for both groups

Ethical consideration:

It is one of the most essential issues in nursing research before collecting data to preserve the principles of ethics; the goal of that is to insure the rights of the researcher and participants. The researcher has ensured the ethical considerations according to the Belmont Report written and published in 1978 by the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (Miracle, 2016).

- University of Baghdad / College of Nursing to accept the study proposal.
- University of Baghdad / College of Nursing - Scientific Research Ethical Committee.

Setting of the Study:

The study was taken place in Al-Najaf Al-Ashraf City/Al-Najaf Health Directorate / Specialized Hospital for Gastrointestinal and Liver Diseases and Surgery

Sample of the Study:

A non-probability (purposive sample) technique was used to select 64 patients and included them in the present study. The sample is randomly assigned into two groups (study and control). The study sample of 64 patients has been randomly divided into two groups. The study group consisted of 32 patients who are exposed to an educational

program by the researcher. The group that didn't expose to the educational program by the researcher is considered the control group, consisting of 32 patients.

Study Instrument:

The researcher selected the instrument of the present study consists of three parts, which are of the following:

Part I: Socio-Demographic Characteristic: The study was concerned with the socio-demographic characteristics of the patients involved. This part included 7 items: age, gender, educational level, marital status, occupation, socio-economic status (monthly income), and residence.

Part II: Clinical Data: This section concerns the clinical data of patients with gastroesophageal reflux disease. This part included 6 items: - duration of the disease, receiving education about GERD management, question about smoking, If the answer is yes, number of cigarettes per day, number of years of smoking.

Part III: Patients' Knowledge of Gastroesophageal Reflux Disease Concerning stress management: This part represents the stress management domains comprising (10) items. This measure measures patients' knowledge about managing stress, how to control it, and its effect on the digestive system. The study instrument is constructed based on previous studies.

Data Collection:

The data collection is done by applying the self-report questionnaire. The data collection method started from 5th July 2023 to 5th September 2023.

Validity of the Instrument:

The validity of an instrument concerns its ability to gather the data it intends to gather. The face and content validity of the educational program and the study instrument are determined through the use of a panel of (17) experts who have more than ten years of experience in their scientific field to review educational programs for their content instruments and to investigate clarity, relevancy, and adequacy of the questionnaire to measure the concepts of interest.

Statistical analysis:

The data were analyzed through the application of descriptive and inferential data analysis methods, including:

a. Tables: Frequencies, Percentages.
b. Graphic presentation using bar charts (Statistical figures).
c. Statistical mean and standard deviation). Stress management is based on the statistical scoring system that indicates total score between (0-0.33) as poor and between (0,34-0.67) as fair; while above (0.68) is good, cutoff point = 0.33. A three-point Likert scale is used for rating the items as correct answer scored (1) and wrong answer scored (0).
d. Used Independent sample t-test
e. Paired t-test determines
f. Used one-way Analysis of Variance (ANOVA)

3. Results

Table (1) Distribution of the Study Patients' according to their Demographic characteristic

Demographic characteristic	Rating and Intervals	Study		Control	
		Freq.	%	Freq.	%
Age / years	<= 24	3	9.40%	3	9.30%
	25 - 29	8	25.00%	6	18.80%
	30 - 34	5	15.60%	4	12.50%
	35 - 39	5	15.60%	4	12.50%
	40 - 44	7	21.90%	5	15.60%
	45 - 49	3	9.40%	6	18.80%
	50+	1	3.10%	4	12.50%
	Total	32	100.00%	32	100.00%
	Mean (Std. D.)	34.66 (8.1)		37.4 (10.3)	
Sex	Male	27	84.40%	23	71.90%
	Female	5	15.60%	9	28.10%
	Total	32	100.00%	32	100.00%
Levels of Education	Read And write	1	3.10%	0	0.00%
	Primary School Graduated	8	25.10%	7	21.90%
	Intermediate School Graduated	5	15.60%	5	15.60%
	Secondary School Graduated	5	15.60%	12	37.50%
	College	13	40.60%	8	25.00%
	Total	32	100.00%	32	100.00%
Marital Status	Single	7	21.90%	5	15.60%
	Married	25	78.10%	27	84.40%
	Total	32	100.00%	32	100.00%
Occupational Status	Housewife	4	12.40%	7	21.90%
	Employee	16	50.00%	13	40.50%
	Jobless	6	18.80%	6	18.80%
	Own Business	6	18.80%	6	18.80%
	Total	32	100.00%	32	100.00%
Monthly Income / IQD	300,000-600,000	6	18.80%	0	0.00%
	601,00-900,000	19	59.30%	20	62.50%
	901,000-1,200,000	5	15.60%	11	34.40%
	1,201,000-1,500,000	2	6.30%	1	3.10%
	Total	32	100.00%	32	100.00%
Residency	Rural	7	21.90%	2	6.20%
	Urban	25	78.10%	30	93.80%
	Total	32	100.00%	32	100.00%

Table (1) indicates the statistical distribution of the participants according to their demographic data. Regarding the study group, the study result indicates that the majority of the study group participants are 25-29 years old (25%), male (84.40%), college (40.60%), married (78.10%), employee (50 %), and their income between 601.00-900.00 IQD (59.30%). Also (78.10%) are living in urban residential areas.

While the control group the study results show that the majority of the control group participants are 25-29 and 45-49 years old; male (71.90%), secondary school graduated (37.50%), married (84.40%), employee (40.50%), and their income between 601,00 to 900,000 IQD (62.50%). Also (93.80%) are living in urban residential areas.

Table (2) Distribution of the Study Patients' according to their Clinical Data

Clinical Data	Rating and Intervals	Study		Control	
		Freq.	%	Freq.	%
Duration of Disease / Years	<= 3	25	78.10%	19	59.30%
	4 - 6	3	9.40%	10	31.30%
	7 - 9	3	9.40%	0	0.00%
	10+	1	3.10%	3	9.40%
	Total	32	100.00%	32	100.00%
Health Education Related GERD	Yes	16	50.00%	18	56.20%
	No	16	50.00%	14	43.80%
	Total	32	100.00%	32	100.00%
Sources of the Received Health Education	None	16	50.00%	14	43.80%
	Physician	2	6.20%	2	6.20%
	Internet	14	43.80%	16	50.00%
	Total	32	100.00%	32	100.00%
Smoking	Yes	8	25.00%	13	40.60%
	No	24	75.00%	19	59.40%
	Total	32	100.00%	32	100.00%
Type of Smoking	None	24	75.00%	19	59.30%
	Pipe Smoking	3	9.40%	2	6.30%
	Cigarettes Smoking	5	15.60%	11	34.40%
	Total	32	100.00%	32	100.00%
Duration of Smoking / Years	None	24	75.00%	19	59.40%
	1 - 3	2	6.20%	2	6.20%
	4 - 6	2	6.30%	5	15.60%
	7 - 9	1	3.10%	3	9.40%
	10+	3	9.40%	3	9.40%
	Total	32	100.00%	32	100.00%
Number of Smoking / Day	None	24	75.00%	19	59.40%
	1 - 10	3	9.40%	4	12.50%
	11 - 20	3	9.40%	8	25.00%
	31+	2	6.20%	1	3.10%
	Total	32	100.00%	32	100.00%

Table (2) illustrates the study's and control groups' clinical data. The result of the study indicates that the majority of both groups, according to the duration of disease, are less than or equal to 3 years in the study group (78.10%) and the control group (59.30%). Concerning receiving health education about GERD, the study group results show an equal percentage (50.00%) while (56.20%) of the patients in the control group receive health education from the Internet. Finally, concerning smoking, the majority of the study and control group are nonsmokers (75.00%), (59.40%).

Table (3) Overall Patients' Knowledge about Stress Management for the Study and Control Groups at the Pre-test.

Patients' Knowledge	Grouping	N	Mean	Std. Deviation	Assessment
Overall Patients' Knowledge about stress management	Study	32	0.3500	0.15450	Fair
	Control	32	0.4406	0.11031	Fair

Cut off point (0.33), M.S (mean of scores), Poor (mean of score 0-0.33), Fair (mean of score 0.34-0.67), Good (mean of score equal or more than 0.68)

Table (3) shows the overall patients' knowledge about stress management was fair in the study and control group at the pre-test.

Table (4) Overall Patients' Knowledge about stress management for the Study and Control Groups at the post-test

Patients' Knowledge	Grouping	N	Mean	Std. Deviation	Assessment
Overall Patients' Knowledge about stress management	Study	32	0.8094	0.11461	Good
	Control	32	0.4469	0.11909	Fair

Cut off point (0.33), M.S (mean of scores), Poor (mean of score 0-0.33), Fair (mean of score 0.34-0.67), Good (mean of score equal or more than 0.68)

Table (4) show the overall patients' knowledge about stress management after educational program application was good in the study group while the control group was fair at the post-test.

Table (5) Mean Difference (Independent Sample T-Test) between the Study and Control Groups Patients' Knowledge at the Post-Test

Main Studied items	Groups	Mean	Std. Deviation	Std. Error Mean	t-value	d.f.	p-value
stress management	Study	0.809	0.115	0.020	12.407	62	0.0001 S
	Control	0.447	0.119	0.021			

NS: Non-Sig. at P>0.05, S: Sig. at P<0.05, HS: high significant at p-value less than 0.01.

Table (5) reveals the differences in patients' knowledge between the study and control groups at post-test; it shows the significant difference in stress management. This means there is an improvement in the patients' knowledge after application of the educational program.

Table (6) Mean Difference (Independent Sample T-Test) in the Study Group Patients' Knowledge at the Post-Test according to their Demographic and Clinical data

Demographic And Clinical Data	Rating	N	Mean	Std. Deviation	Std. Error Mean	t-value	d.f.	p-value
Sex	Male	27	0.87	0.06	0.01	1.617	30	0.116 NS
	Female	5	0.82	0.09	0.04			
Marital Status	Single	7	0.87	0.048	0.018	0.273	30	0.787 NS
	Married	25	0.86	0.074	0.015			
Residency	Rural	7	0.88	0.10	0.04	0.517	30	0.609 NS
	Urban	25	0.86	0.06	0.01			
Health Education	Yes	16	0.88	0.06	0.02	1.124	30	0.270 NS
	No	16	0.85	0.07	0.02			
Smoking	Yes	8	0.87	0.07	0.03	0.0001	30	1.000 NS
	No	24	0.87	0.07	0.01			

P-value = probability value. NS= non-significant

Table (6) shows a non-significant difference in the study group's knowledge at post-test according to their gender, marital status, residency, health education and smoking, at a p-value of more than 0.05.

Table (7) Mean Difference (One Way ANOVA) in the Study Group Patients' Knowledge at the Post-Test according to their Demographic and Clinical data

Demographic and Clinical	Rating and Intervals	N	Mean	Std. Deviation	Std. Error	F	p-value
Age / years	<= 24	3	0.893	0.070	0.041	0.563	0.755 NS
	25 - 29	8	0.870	0.073	0.026		
	30 - 34	5	0.852	0.027	0.012		
	35 - 39	5	0.852	0.101	0.045		
	40 - 44	7	0.891	0.081	0.031		
	45 - 49	3	0.827	0.031	0.018		
	50+	1	0.800	0.0	0.0		
Levels of Education	Read And write	1	0.840	0.0	0.0	3.801	0.014 S
	Primary School Graduated	8	0.803	0.056	0.020		
	Intermediate School Graduated	5	0.852	0.058	0.026		
	Secondary school graduated	5	0.872	0.048	0.022		
	College	13	0.900	0.065	0.018		
Occupational Status	Housewife	4	0.810	0.099	0.049	2.357	0.093 NS
	Employee	16	0.894	0.060	0.015		
	Jobless	6	0.843	0.050	0.020		
	Own business	6	0.847	0.070	0.029		
Monthly income / IQD	300,000-600,000	6	0.873	0.062	0.025	0.364	0.780 NS
	601,00-900,000	19	0.872	0.080	0.018		

	901,000-1,200,000	5	0.840	0.040	0.018		
	1,201,000-1,500,000	2	0.840	0.057	0.040		
Duration of Disease / Years	<= 3	25	0.866	0.074	0.015	0.289	0.833 NS
	4 - 6	3	0.867	0.064	0.037		
	7 - 9	3	0.873	0.050	0.029		
	10+	1	0.800	0.0	0.0		
Sources of Health Education	None	16	0.851	0.075	0.019	0.630	0.540 NS
	Physician	2	0.870	0.014	0.010		
	Internet	14	0.880	0.067	0.018		
Type of Smoking	None	24	0.86	0.069	0.014	0.383	0.685 NS
	Pipe Smoking	3	0.89	0.094	0.054		
	Cigarettes Smoking	5	0.84	0.062	0.028		
Duration of Smoking / Years	None	24	0.865	0.070	0.014	0.308	0.870 NS
	1 - 3	2	0.840	0.028	0.020		
	4 - 6	2	0.910	0.127	0.090		
	7 - 9	1	0.880	0.0	0.0		
	10+	3	0.847	0.083	0.048		
Number of Smoking / Day	<= 0	24	0.865	0.070	0.014	0.318	0.812 NS
	1 - 10	3	0.893	0.095	0.055		
	11 - 20	3	0.860	0.069	0.040		
	31+	2	0.830	0.071	0.050		

Table (7) shows a non-significant difference in the study group's patients' knowledge at post-test according to their demographic and clinical data, at a p-value of more than 0.05, except the level of education was significant at a p-value of 0.014.

4. Discussion

Part I: Discussion for Patients' Socio-Demographic and Clinical Data:

Gastroesophageal Reflux Disease (GERD) is emerging as a major health problem in developing countries. It is a condition affecting millions of people in various countries, and its occurrence is affected by patients' demographic data. The present study's findings indicate that most of the study participants are young adults because many young people have habits that aggravate GERD, such as eating junk food late at night, and they may face a higher risk of severe damage.

(Alhawsawi et al., 2023) they stated that patients between age 25-29 years old are the most vulnerable age group for GERD. In addition, (Hamed & Shrief, 2021) they have studied the fact that the majority of the patients are within age group (25-29). The high rate of occurrence of GERD is due to regular usage of spicy fast food, carbonated drinks, sedentary lifestyle, coffee and unhealthy dietary practices.

The present study also describes sex. The findings indicate that males are the dominant gender. (Boura et al., 2023);(Ogasawara et al., 2022);(Ahmed & Hassan, 2022); (Hamed & Shrief, 2021) they stated that the majority of the study sample were males. In addition, one reason might be that women present with less incidence than men. Female sex hormones also seem to play a protective role in the development of GERD. The naturality of occupation, stress exhibiting, and chronic disease distribution are all of the factors making male more vulnerable to GERD compared with females. Also, differences in lifestyle, such as smoking cigarettes and consuming alcohol, may also help to explain this gender difference.

Concerning the level of education, the study results reveal that the highest percentage of the study sample was secondary school and college graduates. (Alhawsawi et al., 2023); (Bohamad et al., 2023); found in their results that most of the study samples were secondary and college graduates. This may be because most of the study subjects are young age. The current study indicated that the association between health literacy and outcomes may be partially mediated by poor reading comprehension, which indirectly affects patients' knowledge about GERD. Finally, the researcher believed that half of the

patients had a high educational level, which could contribute to poorer health education about GERD and greater difficulty in using health resources.

Concerning marital status, most subjects (78.10%%) are married. Several studies are in agreement with the results of the present study (Bohamad et al., 2023);(Khaleel & Atiyah, 2022b); (Hamed & Shrief, 2021) in their studies, they found that the highest results of their studies samples were married patients. Also, the analysis showed that married people were more likely to have GERD symptoms than single people (including divorced and widows). This relationship between GERD and marital status has been reported by(Ahamed et al., 2018).

Regarding occupational status, the highest percentage was employees. These results are similar to other studies done by (Hamed & Shrief, 2021) and another study by(Jeong et al., 2017); they mentioned that most of the study sample were workers. This result may come because more than one-third of the study participants are younger patients compared to old age; they can't work, and it may be because of the disease and its treatment effects on the patient's lifestyle and daily routine.(Goh & Griva, 2018).

The study also indicates that the majority of the study sample is 601.000 to 900.000. (Bohamad et al., 2023)(Abd Elrahim et al., 2022) they have mentioned in their results that most of the study participants had less than 1-million-dinar Iraqi monthly income. The reason for this result is that more than one-third of the study participants were employees, Therefore, the monthly income of almost all employees is less than one million Iraqi dinars.

Regarding residency, the current study results show that most of the sample live in urban areas. This result in agreement with (Khudhair & Ahmed, 2022) and (Nirwan et al., 2020) they indicated that most of the GERD patients live in urban areas and the remaining live in the countryside. Also, those individuals in rural residential areas often practice daily physical exercises and avoid unhealthy habits such as fast food and spicy food when compared with those in urban areas, making them less risky for GERD than urban residents. Furthermore, the rural residents live in a good environment regarding noises, pollution, and psychological stressors, so they are less prone to get GERD because of the danger reasons that are common in town than countryside areas, e.g., psychological stress.

Concerning the duration of the disease, the higher percentage (78.10%) is for those suffering from the disease for a period equal to less than 3 years. The finding is consistent with the results of (Abd Elrahim et al., 2022) and (Xu et al., 2016), who claimed that the duration of disease for the majority of their samples is from 1 to < 5 years.

Regarding health education, the results of the items involved in health education related to GERD show that half of the sample did not receive any education, and the other half did receive education, knowing that education sources were from the internet. This means the patients need a specific hospital unit with specific nursing personnel to be responsible for the information and education needed about the disease and their management. The finding is consistent with the results of (Bohamad et al., 2023) and (Jeong et al., 2017) who mentioned that half of the study sample had not received education.

The study shows that most of the patients (75%) are non-smokers, and few of them (25%) are smokers, which is considered unhealthy behaviour for GERD patients. A study by (Al Zabadi et al., 2018) found that most of the study subjects were non-smokers. (Wang et al., 2016) emphasized tobacco can cause weakness of the pyloric sphincter and lead to GERD. Heavy smokers increase their danger of developing GERD when they are compared with non-smokers. Furthermore, the use of tobacco can speed up the weak sphincter, leading to GERD.

Part II: Discussion patients' Knowledge about stress management with Gastroesophageal Reflux Disease in the study and Control Groups at (Pre-Post-Tests)

The data analysis patients' knowledge about medication adherence for Gastroesophageal Reflux Disease. The findings of patients' knowledge regarding stress management showed that the overall mean level in both groups (the study and the control) had a fair level of knowledge in the pre-test. While, at the post-test, the study group

improved in good knowledge. This improvement in patients' knowledge indicated the effectiveness of the provided educational program. Patients need continuous educational programs to improve their knowledge and follow up on the most current evidence-based practices. Encouraging patients to be self-learners is one of the most crucial strategies for providing safe, high-quality of life. Overall, the patients' knowledge regarding stress management with gastroesophageal reflux disease for study and control groups at the pre-test was fair.

Psychological stress management plays a crucial role in the pathogenesis of gut motility abnormalities. Accordingly, emotional stress is believed to be a precipitating factor of gastrointestinal symptoms in patients with functional gastrointestinal disorders. Increased resting lowers esophageal sphincter (LES) pressure, which impairs sphincter relaxation and thus delays acid clearance from the esophagus. However, while the application of psychological relaxation techniques has led to significant reductions in reported heartburn and duration of esophageal acid exposure, Similarly, evidence suggests that stress plays an important role in the presentation of gastroesophageal reflux disease (GERD).(Park et al., 2017)

The findings of the current study found that the effect of the educational program on a study group was positive in improving patients' knowledge regarding stress management due to a change in total mean from 0.350 pre-test to 0.809 on the post-test, while the control group was not affected the total mean which at pre-test 0.441 to post-test 0.447.

Xu, et al., (Xu et al., 2016) indicated in their study that the comparison of the results in the study showed that the self-management program could effectively improve depression and anxiety and tend to pay more attention to psychological characteristics and teach coping skills with emotion regulation to patients. In addition, the study can promptly find psychological problems and provide an outlet for them by ensuring regular follow-up. The study found that the experimental group had a significant decrease in anxiety and depression before and after the intervention. The control group demonstrated a significant change in anxiety but no significant difference in depression before and after the intervention. When changes in the two groups over 3 months were compared, the experimental group was found to experience a significantly greater decrease in the incidence of depression and anxiety than the control group.

Sandhu and Fass (Sandhu & Fass, 2018) concluded in their study that both acute and chronic stress can exacerbate GERD-related symptoms; however, acute stress can exacerbate GERD symptoms by modulating the perception threshold for pain by stress decreases lower esophageal sphincter tone, leading to increased symptoms of GERD.

In their study, Awadalla (Awadalla, 2019) found that 12.6% of college students suffered a high level of perceived stress, and the subjects exposed to high perceived stress were at higher risk of GERD. Elnemr, et al., (Elnemr et al., 2018) they indicated in their study that a positive association between stress and reflux esophagitis. Exposure to stress increases the secretion of gastric acid, slows and delays gastric emptying, and causes reflux. Moreover, a previous study reported that most patients with GERD suffered exaggerated symptoms when faced with stressful events. (Argyrou et al., 2018)(Menezes & Herbella, 2017)

The researcher attributed the lack of knowledge about the importance of stress management in treating the condition as the reason for the exacerbation of the disease. After explaining and clarifying how to manage stress through the educational program, the researcher realized the improvement in the patients' knowledge about the psychological aspect of the patient in reducing stress. (Guadagnoli et al., 2022)(Hamed & Shrief, 2021) (Khafel & Yousif, 2019)

(Alsulobi et al., 2017) They indicated in their study that the patient’s education and appropriate guidelines are very important based on each patient's actual needs and are tailored to the level of understanding at routine visits. The study was conducted to increase

patient information and improve health promotion. (Khaleel & Atiyah, 2022a). (Khasal et al., 2019) (Shawwat & Atiyah, 2022)

Part III: Discussion of Relationship between patients' Knowledge and Socio-Demographic and clinical data for Study Group at (Post-Test).

The results of the present study revealed that the study and control groups were comparable in their knowledge of various demographic characteristics.The current study exposes that there is a non-significant difference between study group patients' knowledge at post-test and their socio-demographic and clinical data such as (age, gender, marital status, occupation, socio-economic status (monthly income), Residence, duration of the disease, receiving education about GERD management, question about smoking) at a p-value of more than 0.05 except the level of education was significant at p-value 0.014.

The results of the study conducted by (Bohamad et al., 2023) were also in the same line as the current results; there was a significant difference in the level of awareness according to an educational level only with their selected demographic variables.

A study done by (Abd Elrahim et al., 2022) stated that there were significant relations between total knowledge scores with selected socio-demographic data pre and posttest, it was found that there was a statistically significant relation between participants' total knowledge with their age, residence, and occupation in the pretest and a highly significant difference with their level of education posttest. And from the researchers' point of view, this correlation may be due to the better experience obtained throughout years of life. In the same context, knowledge level was found to be related to a higher level of education. This is a normal finding, as the higher one's educational degree, the better one's chances of gaining relevant experience and knowledge.

This finding was supported by (Alhawsawi et al., 2023) in their study stated that education level was associated with GERD; patients with a secondary educational level are more likely to report GERD symptoms than other categories (less than secondary, university or higher degrees).

In addition, the current study result agreed with (Xu et al., 2016) revealed in the study that subjects with higher educational levels had a lower prevalence of GERD. Which showed that a lower educational level may increase the risk of GERD.

Also, (Hamed & Shrief, 2021) stated that there is no significant relationship between the participants' demographic data and the total scores of their knowledge, medication adherence, and quality of life except in educational level, which was highly statistically significant at a p-value of 0.0001.

Briefly, nurses play an essential role in decreasing the deterioration of patients' health conditions. Nurses must be competent and qualified to achieve desired outcomes. Nevertheless, a continuous educational program for patient is considered a cornerstone for effective nursing care.

5. Conclusion

Based on the study results, the study concluded the following: (1) The study confirms that the study program is an effective way to improve patients' knowledge regarding stress management with GERD. (2) All items regarding patients' socio-demographic and clinical data have not been influenced by their knowledge, except their level of education, which positively influences patients' knowledge. (3) There were improvements in patients' knowledge after the post-test for the study group after implementing an educational program regarding stress management with GERD. Meanwhile, the control group did not present any improvement in their knowledge regarding stress management after GERD at pre and post-test.

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