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EFFECTIVENESS OF AN EDUCATIONAL PROGRAM ABOUT MEDICATION ADHERENCE ON PATIENTS' KNOWLEDGE WITH GASTROESOPHAGEAL REFLUX DISEASE

Bashar R. Mohammed Ali[1], Hussein H. Atiyah[1]

[1]Department of Adult Nursing, University of Baghdad, college of Nursing, Iraq

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Corresponding Author:
Bashar R. Mohammed Ali

Email:

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 and resulting in troublesome symptoms or complications. ***Objective(s):*** *the study to assess patients' knowledge about medication adherence with Gastroesophageal Reflux Disease and to evaluate patients' knowledge about medication adherence with Gastroesophageal Reflux Disease, in addition to determine the effectiveness of educational program on patients' knowledge about medication adherence with gastroesophageal reflux disease. Also, to find out the relationship between patients' knowledge and their socio-demographic and clinical data.* ***Methods:*** *Quasi experimental design was implemented in the present study by which the patients are assigned 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 from April 2nd, 2023 until April, 1st, 2024. A non-probability (purposive sample) technique selected 64 patients included in the present study. Data collected through using of a well-designed questionnaire consist of three parts: part I: Socio-Demographic Characteristic. part II: Clinical Data and Part III: Patients' Knowledge of Gastroesophageal Reflux Disease Concerning medication adherence.* ***Results:*** *the present study indicate that the overall patients' knowledge about medication adherence after educational program application was good in study group while in control group was fair at post-test. In addition, that 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 p-value 0.014.* ***Conclusion:*** *The study concludes that a positive effect of the educational program on the patients' knowledge regarding medication adherence after GERD, and as this effect is proved. The study recommends that nursing education guideline should 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 the management of patients with gastroesophageal reflux disease.*

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 (1,2).

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 (3). 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 (4).

Gastroesophageal Reflux Disease (GERD) is a worldwide spread disease, numerous survey studies showed the prevalence of GERD that was 27.8% in North America, 25.9% in Europa, 11.6% in Australia, and 23% in South America; while GERD was less than 10% in East Asia. Moreover, 7.1% of South Korean was affected by GERD. Obviously, GERD prevalence based on individuals' awareness of its symptoms ranged from 2.5% to 25% (5,6).

Medications and lifestyle modifications are considered first line treatments for GERD. When these first-line treatments fail, surgery may become necessary to control GERD. On the other hand, in some cases lifestyle changes including weight loss, diet changes, and eliminating tobacco may improve GERD symptoms at a low cost with few side effects. (7,8,9,10).

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 prevention of disease and promotion of health, and in promoting staff nurses' competence and confidence in practice through continuing education activities (11,12).

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 quality of life and symptom management (13).

METHODOLOGY

Design of the Study:

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

Ethical consideration:

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 insured the ethical considerations according to the Belmont Report that was written and published in 1978 by the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (14).

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 selected 64 patients included 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 and consisted 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: It was concerned with the socio-demographic characteristics of the patients involved in the study. This part included 7 items, including; age, gender, educational level, marital status, occupation, socio-economic status (monthly income), and Residence.

Part II: Clinical Data: It was concerned with 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 medication adherence: This part represents the medication adherence which consists of (10) items. Which measures patient knowledge Patients' knowledge about their treatment adherence, its side effects, and timing. The study instrument is constructed based on previous studies.

Data Collection:

The data collection is done by applying of 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 that it is intended 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 program for its 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 application of the descriptive and inferential data analysis methods, included:

A. Tables: Frequencies, Percentages.

B. Graphic presentation by using bar charts (Statistical figures).

C. Statistical mean and standard deviation). Medication adherence are based on the statistical scoring system that indicated total score between (0-0.33) as poor; 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.

RESULTS AND DISCUSSION

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): this table illustrates the clinical data of study and control groups. 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 that an equal percentage (50.00%) while (56.20%) of the patients in the control group receive their health education from the Internet. Finally, concerning smoking, the majority of the study and control group are nonsmokers (75.00%), (59.40%).

Table 3. Assessment of Patients' Knowledge about medication adherence for the Study and Control Groups at the Pre-test

N.	Section IV: Medication adherence Items	Grouping	Mean	Std. Deviation	Assessment
1.	What does medication adherence mean for a patient with GERD**?**	Study	0.0313	0.17678	Poor
		Control	0.0000	0.00000	Poor
2.	What should patients do if they experience side effects from their GERD medication**?**	Study	0.0625	0.24593	Poor
		Control	0.0000	0.00000	Poor
3.	What is the recommended duration for taking GERD medication**?**	Study	0.0313	0.17678	Poor
		Control	0.0313	0.17678	Poor
4.	What should patients do if they miss a dose of their GERD medication**?**	Study	0.2500	0.43994	Poor
		Control	0.6250	0.49187	Fair
5.	It is safe to stop taking GERD medication once symptoms have resolved**.**	Study	0.0313	0.17678	Poor
		Control	0.0625	0.24593	Poor
6.	When is the best time to take GERD medication**?**	Study	0.1875	0.39656	Poor
		Control	0.0625	0.24593	Poor
7.	Can GERD medication be taken with other medications**?**	Study	0.2188	0.42001	Poor
		Control	0.0625	0.24593	Poor
8.	How long should patients wait after taking GERD medication before lying down**?**	Study	0.3750	0.49187	Fair
		Control	0.4688	0.50701	Fair
9.	Can GERD medication be taken on an empty stomach**?**	Study	0.1875	0.39656	Poor
		Control	0.0000	0.00000	Poor
10.	GERD medications can completely cure the condition and eliminate all symptoms	Study	0.2813	0.45680	Poor
		Control	0.0000	0.00000	Poor

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 that the patients' knowledge responses at the pre-test to the medication adherence domain Items in both group study and control were poor in most of the items. Consequently, overall patients' knowledge about medication usage was poor in the study and control group.

Table 4. Overall Patients' Knowledge about medication adherence for the Study and Control Groups at the Pre-test.

Patients' Knowledge	Grouping	N	Mean	Std. Deviation	Std. Error Mean	Assessment
Overall Patients' Knowledge about medication adherence	Study	32	0.1656	0.14280	0.02524	Poor
	Control	32	0.1313	0.09651	0.01706	Poor

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) shows the overall patients' knowledge about medication adherence was poor in the study and control group at pre-test.

Table 5. Assessment of Patients' Knowledge about medication adherence for the Study and Control Groups at the Post-test

N.	Section IV: Medication adherence Items	Grouping	Mean	Std. Deviation	Assessment

1.	What does medication adherence mean for a patient with GERD?	Study	0.9063	0.29614	Good
		Control	0.0313	0.17678	Poor
2.	What should patients do if they experience side effects from their GERD medication?	Study	0.5625	0.50402	Fair
		Control	0.0000	0.00000	Poor
3.	What is the recommended duration for taking GERD medication?	Study	0.7188	0.45680	Good
		Control	0.0313	0.17678	Poor
4.	What should patients do if they miss a dose of their GERD medication?	Study	0.7813	0.42001	Good
		Control	0.6563	0.48256	Fair
5.	It is safe to stop taking GERD medication once symptoms have resolved.	Study	0.8438	0.36890	Good
		Control	0.0938	0.29614	Poor
6.	When is the best time to take GERD medication?	Study	0.8750	0.33601	Good
		Control	0.1250	0.33601	Poor
7.	Can GERD medication be taken with other medications?	Study	0.9375	0.24593	Good
		Control	0.0938	0.29614	Poor
8.	How long should patients wait after taking GERD medication before lying down?	Study	0.9688	0.17678	Good
		Control	0.4688	0.50701	Fair
9.	Can GERD medication be taken on an empty stomach?	Study	0.8750	0.33601	Good
		Control	0.0313	0.17678	Poor
10.	GERD medications can completely cure the condition and eliminate all symptoms	Study	0.8750	0.33601	Good
		Control	0.0625	0.24593	Poor

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 (5) Table shows that the patients' knowledge responses at the post-test to the medication usage domain items in study group were good in the most of the items except the item number two was fair. While in the control group were poor in the most of the items except the item number four and eight was fair.

Table 6. Overall Patients' Knowledge about Medication adherence for the Study and Control Groups at the post-test.

Patients' Knowledge	Grouping	N	Mean	Std. Deviation	Std. Error Mean	Assessment
Overall Patients' Knowledge about medication adherence	Study	32	0.8344	0.13821	0.02443	Good
	Control	32	0.1594	0.11319	0.02001	Poor

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 (6) show the overall patients' knowledge about medication adherence after educational program application was good in study group while in control group was poor at post-test.

Table 7. 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
medication adherence	Study	.834**0**	.138**0**	.024**0**	21.374	62	0.0001 (S)
	Control	.159**0**	.113**0**	.020**0**			

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

Table (7) reveals the differences in patients' knowledge between the study and control groups at post-test; it shows significant difference in medication adherence. This mean there is improvement in the patients' knowledge after application of educational program.

Table 8. 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	.870	.060	.010	1.617	30	0.116 NS
	Female	5	.820	.090	.040			
Marital Status	Single	7	.870	.0480	.0180	.2730	30	0.787 NS
	Married	25	.860	.0740	.0150			
Residency	Rural	7	.880	.100	.040	.5170	30	0.609 NS
	Urban	25	.860	.060	.010			
Health Education	Yes	16	.880	.060	.020	1.124	30	0.270 NS
	No	16	.850	.070	.020			
Smoking	Yes	8	.870	.070	.030	.00010	30	1.000 NS
	No	24	.870	.070	.010			

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

Table (8) 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 9. 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	.893**0**	.070**0**	.041**0**	0.563	0.755 NS
	25 - 29	8	.870**0**	.073**0**	.026**0**		
	30 - 34	5	.852**0**	.027**0**	.012**0**		
	35 - 39	5	.852**0**	.101**0**	.045**0**		
	40 - 44	7	.891**0**	.081**0**	.031**0**		
	45 - 49	3	.827**0**	.031**0**	.018**0**		
	50+	1	.800**0**	0.0	0.0		
Levels of Education	Read And write	1	.840**0**	0.0	0.0	3.801	0.014 S
	Primary School Graduated	8	.803**0**	.056**0**	.020**0**		
	Intermediate School Graduated	5	.852**0**	.058**0**	.026**0**		
	Secondary school graduated	5	.872**0**	.048**0**	.022**0**		
	College	13	.900**0**	.065**0**	.018**0**		
Occupational Status	Housewife	4	.810**0**	.099**0**	.049**0**	2.357	0.093 NS
	Employee	16	.894**0**	.060**0**	.015**0**		
	Jobless	6	.843**0**	.050**0**	.020**0**		
	Own business	6	.847**0**	.070**0**	.029**0**		
Monthly income / IQD	300,000-600,000	6	.873**0**	.062**0**	.025**0**	0.364	0.780 NS
	601,00-900,000	19	.872**0**	.080**0**	.018**0**		

	901,000-1,200,000	5	.8400	.0400	.0180		
	1,201,000-1,500,000	2	.8400	.0570	.0400		
Duration of Disease / Years	<= 3	25	.8660	.0740	.0150	0.289	0.833 NS
	4 - 6	3	.8670	.0640	.0370		
	7 - 9	3	.8730	.0500	.0290		
	10+	1	.8000	0.0	0.0		
Sources of Health Education	None	16	.8510	.0750	.0190	0.630	0.540 NS
	Physician	2	.8700	.0140	.0100		
	Internet	14	.8800	.0670	.0180		
Type of Smoking	None	24	.860	.0690	.0140	0.383	0.685 NS
	Pipe Smoking	3	.890	.0940	.0540		
	Cigarettes Smoking	5	.840	.0620	.0280		
Duration of Smoking / Years	None	24	.8650	.0700	.0140	0.308	0.870 NS
	1 - 3	2	.8400	.0280	.0200		
	4 - 6	2	.9100	.1270	.0900		
	7 - 9	1	.8800	0.0	0.0		
	10+	3	.8470	.0830	.0480		
Number of Smoking / Day	<= 0	24	.8650	.0700	.0140	0.318	0.812 NS
	1 - 10	3	.8930	.0950	.0550		
	11 - 20	3	.8600	.0690	.0400		
	31+	2	.8300	.0710	.0500		

P-value = probability value. NS: Non-Sig. at P>0.05, S: Sig. at P<0.05.

Table (9) 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 level of education was significant at p-value 0.014.

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 of young adult because many young people have habits that aggravate GERD such as eating junk food late at night, they may face a higher risk of severe damage.

(Alhawsawi et al., 2023) they stated that the patients within age 25-29 years old are more the vulnerable age group for GERD. In addition, (Hamed & Shrief, 2021) they have studied the they found 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 the male is the dominant gender. (2,15,16,6) 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 all of these factors making the male is more vulnerable for GERD compared with female. 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 graduate. (17, 18) they found in their results that the majority of the study samples were secondary and college graduate. 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 has an indirect effect on patients' knowledge about GERD. Finally, researcher believed that the half of patients had a high educational level, which could contribute to poorer health education about GERD and greater difficulty in using health resources.

Concerning to marital status, majority of subjects (78.10%%) are married. Several studies are in agreement with the results of the present study (18) (6) 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(19).

Regards to occupational status, the highest percentage was employee. These results are similar to other studies done by (19) also another study by (5) they mentioned that most of the study sample were workers. This result may come because more than one-third of the study participants are within younger patients compared to old age they can't work and may be because of the disease and its treatment effects on patient lifestyle and daily routine (20).

The study also indicates that the majority of the study sample have a 601.000 to 900.000. (18, 21) 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 because more than one-third of the study participants were employee, 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 is live who at urban area. This result in agreement with (22) and 23) they indicated that the majority of the GERD patients is living in urban area and the remaining is living in the countryside. Also, those individuals in rural residential area often practice daily physical exercises and avoid unhealthy habits such as fast food and spicy food when compared with those in urban, so they less risky for GERD than urban residents. Furthermore, the rural residents are lived in a good environment in regarding to noises, pollution, and psychological stressors so they less prone to get GERD because of the danger reasons that are common in town than countryside areas e.g. psychological stress.

Concerning duration of disease, the higher percentage (78.10%) is for those who are suffering from the disease for period equal and less than 3 years. The finding is consistent with results of (21) and (24) they claimed that the duration of disease for majority of their samples are from 1 to < 5 years.

Regard to health education, the results of the items which are involved they receive health education related to GERD, the results show that half of the sample did not receive any education, and the other half did receive education knowing that sources of education were from the internet. This means the patients need a specific unit in the hospitals 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 (18) and (5) they 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%) smoker which is considered unhealthy behavior for GERD patients. In study done by (30) who found that the majority of the study subjects is non-smoker. (25) emphasized tobaccos 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 in sphincter leading to GERD.

Part II: Discussion patients' Knowledge about Medication adherence with Gastroesophageal Reflux Disease in study and Control Groups at (Pre-Post-Tests) (Table 1-7)

The data analysis patients' knowledge about medication adherence for Gastroesophageal Reflux Disease. The findings of patients' knowledge regarding medication adherence showed that the overall mean level in both groups (the study and the control) had a poor level of knowledge in the pre-test. While, at the post-test, the study group improved to good knowledge. This improvement in patients' knowledge indicated the effectiveness of the provided educational program. patients need continuous educational programs to raise their knowledge and follow up with 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 patients' knowledge regarding medication adherence with Gastroesophageal Reflux Disease for study and control groups at the pre-test was poor.

The paired t-test was used in the statistical analysis to compare the same group results through two periods of measurements (Pre-test and Post-test). The results indicate that there is no significant difference at a P-value of more than (0.05) among pre-test and post-test assessments in the control group, while there is a highly statistically significant difference ($P < 0.01$) among pre-test and post-test assessments in the study group. This indicates that there is improvement in the patients' knowledge after the program

In comparison, an independent t-test was used to compare the results of the study group with the control group. The study found statistically significant difference between the pre-test and post-test

Medication adherence domain, the adherence to medical therapy is an important factor to control GERD symptoms and for the prevention of its complications. Poor adherence plays a key role in GERD management failure. Generally, adherence is associated with many factors including, cultural, social, fear from chronic medication use and side effects, as well as factors related to patient such as awareness, understanding, level of education, as well as the financial state of the patient, a poor relationship between healthcare provider and patient, and unclear instructions and recommendations to the patient. In addition, most studies suggested gaps in knowledge regarding GERD medication and usage that may impact adherence. Improving adherence can start with identifying behaviors associated with incorrect routines and developing targets for behavior change. For example, if a patient report taking their PPI after symptom onset (as opposed to 30 minutes before a meal), a provider can work with them to provide accurate education, and identify barriers to proper adherence (eg, they forget to take the PPI until they notice symptoms), also, implement a behavioral strategy to improve adherence (eg, setting alarm on phone to remind before meal time). Physician led to increased knowledge around GERD management because physician-patient conversations is associated with increased patient education, including knowing the best time to take anti-reflux medications as well as knowledge about the beneficial effects of lifestyle modifications on symptom and disease severity (8).

The findings of current study revealed that there was a positive effect of educational program on patient knowledge regarding adherence of medication due to improve their knowledge by results of total mean from 0.166 in pre-test to 0.834 at post-test, while there was no effect on control group the total mean which at pre-test 0.131 to post-test 0.159.

(6) they indicated in their study that the participants' medication adherence, the results showed more than half of them that were non-adherent to the prescribed medications. A potential

explanation for this finding may be due to a lack of knowledge about the importance of adherence and their fear of the adverse effect of medications or economical factor. In addition, the current results are in agreement with (2) who is evaluate the degree of adherence to Proton Pump Inhibitor (PPI) treatment in 240 patients with GERD, revealed (53.8%) of the participants that were forgetting to take PPI. Additionally, GERD patients on PPI were poorly compliance with medication (26).

(19) they founded in their study that more than two third of the patient's in both studied groups total knowledge was unsatisfactory at the pretest, the deficiency was most evident concerning treatment regimen. The finding is indicators regarding lack of information which affect negatively on patient outcomes this result agreement with. At the posttests intervention of this study revealed the study group achieved a statistically significant improved in posttests at all items than control group. This improvement could be indicator of the success of the educational program to meet the cognitive needs of patients and also increase patient's awareness that he became a partner in the treatment plan, which contributed to a positive behavioral change. In addition to confirm the Giving information routinely without relying on the actual needs of them during follow-up.

(27) they indicated in their study are emphasized on the patient's education and appropriate guidelines is very important to base on each patient actual needs tailored to level of understanding at routine visits. Also, the study was conducted on increase patient information contribute to improve of health promotion (28).

(5) they indicated in their study that the treatment of GERD, approximately 50% of patients knew that acid production inhibitors are used to treat GERD, but only 28% knew that sedatives are not an important treatment for reflux disease, and only 26% knew that prokinetics are used to treat GERD. These findings show that many Koreans have a relatively low degree of knowledge regarding GERD treatment, which, again suggest the need for a systematic patient education program (9,29).

The researcher attributed that patients had poor knowledge about side effect and best time of taking medication and left medication after symptoms have resolved, but with information about the danger of non-adherence to medication and the importance of adherence to it, patients' knowledge about adherence to medication increased.

Part III: Discussion of Relationship between patients' Knowledge and Socio-Demographic and clinical data for Study Group at (Post-Test). (Table 8 and 9)

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 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), and Residence, duration of the disease, receiving education about GERD management, question about smoking) at a p-value of more than 0.05 except level of education was significant at p-value 0.014.

The results of the study conducted by (18) also were 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 was done by (21) 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 (17) 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 (24) revealed in the study that subjects with higher educational level had a lower prevalence of GERD. Which showed that lower educational level may increase the risk of GERD.

Also, (6) 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 was a highly statistically significant at p-value 0.0001.

Briefly, Nurses play an essential role in decreasing patient's health condition deteriorated. Nurses must be competent and qualified to achieve desired outcomes. Nevertheless, a continuous educational program for patient is considered a cornerstone for an effective nursing care.

Finally, the educational program has the potential to bridge the gap between theory and practice. Many previous research studies have ascertained that providing in-service educational courses positively impacts patients' knowledge. The theory that guided this study is an applicable conceptual framework in nursing research and education. The findings of this study demonstrated that educational program played an important role in increasing knowledge that ultimately reflect achieving the best patient outcomes. The teaching-learning strategies during the implementation phase of the educational program are adopted by incorporating flexible approaches to meet each patients' individual learning needs.

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 medication adherence with GERD.

2- The knowledge score regarding the medication adherence after GERD was poor.

3- All items regarding patients' socio-demographic and clinical data have been not influenced by their knowledge, except their level of education has a positive influence on patients' knowledge.

4- There were improvements in patients' knowledge after post-test for the study group after implementing an educational program regarding medication adherence with GERD. Meanwhile, the control group did not present any improvement in their knowledge regarding medication adherence after GERD at pre and post-test.

RECOMMENDATIONS:

Based on the study conclusion, the study recommends the following:

1- A simplified and comprehensive booklet, including updated guidelines regarding gastroesophageal reflex disease management, should be introduced to all patients and should be clearly explained by photos for illiterate patients.

2- A nursing education guideline should 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 the management of patients with gastroesophageal reflux disease.

3- Health information concerning gastroesophageal reflex disease should available on the internet or to prepare handouts or booklets to be distributed through the health care facilities.

Using the current study's findings as a guideline in the management of patients with gastroesophageal reflux disease and suffering from a low level of patients' knowledge in hospitals and specialized centers.

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