Effectiveness of an Educational Program about Dietary Habits on Patients' Knowledge of Gastroesophageal Reflux Disease

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Abstract: Objective to determine the effectiveness of educational program on patients' knowledge about dietary habits with GERD. Also, to find out the relationship between patients' knowledge and their socio-demographic and clinical characteristics. A quasi-experimental design was assigned into study and control groups by using pre and post-test. The study started on April 2nd, 2023, until April 1st, 2024. A non-probability (purposive sample) technique selected 64 patients. Data collected through using questionnaire consist of three parts: part I: Socio-Demographic Characteristic. Part II: Clinical Data and Part III: Patients' Knowledge of GERD Concerning Dietary Habits. the overall patients' knowledge about dietary habits after educational program application was good in the study group, while in the control group was fair at the 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, except level of education was significant. a positive effect of the educational program on the patients' knowledge regarding dietary habits after GERD. educational programs in health organizations should be activated and a simplified and comprehensive booklet, including updated guidelines regarding GERD management, should be introduced and should be clearly explained by photos for illiterate patients.

Keywords: Program Evaluation, Feeding Behavior, Patient, Knowledge, Esophageal Motility Disorders

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. The classical symptoms of GERD are heartburn (a retrosternal burning pain radiating up towards the throat) and acid regurgitation (the perception of stomach contents coming into the hypopharynx or mouth). Further, GERD may be accompanied by fullness or early satiety, symptoms that mimic functional dyspepsia(Boura et al., 2023; Talley & Zand Irani, 2021)(Sadafi et al., 2024)(Chen et al., 2024).

Different types of food were found to be highly associated with increasing GERD symptoms among the patients, including fried food, spicy food, soft drinks, citrus foods, and drinks in addition to tea and coffee. Although most patients suffer from mild symptoms of the disease that can be controlled with modification of their lifestyle habits and avoiding certain drugs, many patients could have severe atypical symptoms that might lead to complications(Alqallaf; et al., 2022), (Yu et al., 2024).

Patient education has been proven to have a positive impact on a variety of chronic diseases and become an important prevention strategy for some diseases. 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 (Alqallaf; et al., 2022; Chen et al., 2022).

Gastroesophageal Reflux Disease (GERD) is a worldwide spread disease; numerous survey studies showed the prevalence of GERD was 27.8% in North America, 25.9% in Europe, 11.6% in Australia, and 23% in South America, while GERD was less than 10% in East Asia. Obviously, GERD prevalence based on individuals' awareness of its symptoms ranged from 2.5% to 25% (Hamed & Shrief, 2021; Jeong et al., 2017).

Dietary modification is a proposed first-line therapy for patients with GERD. The National Institutes of Health and the American College of Gastroenterology recommend that patients with GERD reduce their intakes of total fat, chocolate, alcohol, citrus and tomato products, coffee, tea, and large meals and

implement other lifestyle changes such as stopping smoking and weight reduction. 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 (Kubo et al., 2014)(Lakananurak et al., 2024).

Several patients have been demonstrated to benefit from nursing educational programs regarding many diseases. So, it's critical to determine how much patients already know about GERD before properly educating them. Lifestyle, eating habits, exercise, psychology, and acupuncture interventions all work together to improve pharmacological therapy, therapeutic benefits, adherence, and symptom relief. The present study is designed to improve knowledge among patients with GERD through Self-care model. There are no previous studies in Iraq focus on such problem. Therefore, the present study fill a gap in nursing research (Coyoca et al., 2024).

"In adult patients experiencing GERD, what is the effect of educational program, compared with control group, on patient knowledge about self-care within 3 weeks?"

Material and Methods

Study Design:

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. The setting of 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 and sampling:

A non-probability (purposive sample) technique selected 64 patients included in the present study. All participants are medically diagnosed with gastroesophageal reflux disease by physician diagnosis report, those who visit the Specialized Hospital. 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 were exposed to an educational program by the researcher. The group that didn't exposed to the educational program by the researcher is considered the control group and consisted of 32 patients.

Intervention:

The data collection is done by applying of the self-report questionnaire and the researcher use Arabic version of the questionnaire. Regarding the evaluation of the patients' knowledge after the application of the educational program for the study group, the researcher uses three lectures (one lecture in a week for three weeks (21 days)) and then uses a post-test. For the control group, the researcher uses a pre-test and post-test evaluations without the application of the educational program, and they still on same knowledge.

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. Study Instrument: The researcher selected the instrument of the present study consists of three parts, which are 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 Dietary Habits: This part represents the dietary habits of a patient with Gastroesophageal Reflux Disease. It is comprised of (10) items, evidence that those patients' knowledge about the proper dieting behaviors helps them to maintain the management of their disease. The study instrument is based on previous studies and guidelines, such as the American Gastroenterological Association in 2018, American Journal of Gastroenterology, and National Institute of Diabetes and Digestive and Kidney Diseases in 2023. Moreover, the study protocol is registered at the International Clinical Trials Registry Platform (ICTRP) in the World Health Organization (Registration Number IRCT20231115060062N1) to meet the requirements of the International Committee of Medical Research; additionally, to be scientific, legal, ethical and moral responsibility. Also, the content validity is used to validate the study instrument, by which a panel of nursing education experts are reviewed the study instrument for its content.

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 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 (Miracle, 2016).

- University of Baghdad / College of Nursing to accept the study proposal.

- University of Baghdad / College of Nursing - Scientific Research Ethical Committee.

Data analyses:

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

A. Tables: Frequencies, Percentages, Graphic presentation by using bar charts (Statistical figures).

B. Statistical mean and standard deviation. Dietary habits are based on the statistical scoring system that indicated a 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).

C. Used (Independent sample t-test, Paired t-test determines)

D. Used one-way Analysis of Variance (ANOVA)

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	Read And write	1	3.10%	0	0.00%

Education	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%

Freq.= frequency, %= percent

Table 1 indicates the statistical distribution of the participants according to their demographic Characteristics. 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%

Freq.= frequency, %= percent

Table 2: this table illustrates the clinical data of the 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. Overall Patients' Knowledge about Dietary Habits for the Study and Control Groups at the Pre-test and Post-test.

Patients' Knowledge	Grouping	N	Mean	Std. Deviation	Assessment
Overall, Patients' Knowledge about Dietary Habits at Pre-Test	Study	32	0.4344	0.21644	Fair
	Control	32	0.3500	0.19838	Fair
Overall, Patients' Knowledge of Dietary Habits at Post-Test	Study	32	0.8844	0.09873	Good
	Control	32	0.3625	0.19634	Fair

N= Number, 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 Dietary Habits was fair in the study and control group at the pre-test. While the overall patients' knowledge after the educational program application was good in the study group and the control group was fair at the post-test.

Table 4. 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
Dietary Habits	Study	0.884	0.099	0.017	13.433	62	0.0001 S
	Control	0.363	0.196	0.035			
	Control	0.361	0.099	0.017			

d.f= Degree of Freedom. P-value = probability value, S: Sig. at P<0.05.

Table 4 reveals the differences in patients' knowledge between the study and control groups at the post-

test; it shows significant differences in all domains. This means there is an improvement in the patients' knowledge after the application of the educational program.

Table 5. 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
	Female	5	0.82	0.09	0.04			NS
Marital Status	Single	7	0.87	0.048	0.018	0.273	30	0.787
	Married	25	0.86	0.074	0.015			NS
Residency	Rural	7	0.88	0.10	0.04	0.517	30	0.609
	Urban	25	0.86	0.06	0.01			NS
Health Education	Yes	16	0.88	0.06	0.02	1.124	30	0.270
	No	16	0.85	0.07	0.02			NS
Smoking	Yes	8	0.87	0.07	0.03	0.0001	30	1.000
	No	24	0.87	0.07	0.01			NS

N= Number. d.f= degree of freedom, P-value = probability value. NS= non-significant.

Table 5 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 6. 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
	25 - 29	8	0.870	0.073	0.026		NS
	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
	Primary School Graduated	8	0.803	0.056	0.020		S
	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
	Employee	16	0.894	0.060	0.015		NS
	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
	601,00-900,000	19	0.872	0.080	0.018		NS
	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
	4 - 6	3	0.867	0.064	0.037		NS
	7 - 9	3	0.873	0.050	0.029		

	10+	1	0.800	0.0	0.0		
Sources of	None	16	0.851	0.075	0.019	0.630	0.540
Health	Physician	2	0.870	0.014	0.010		NS
Education	Internet	14	0.880	0.067	0.018		
Type of	None	24	0.86	0.069	0.014	0.383	0.685
Smoking	Pipe Smoking	3	0.89	0.094	0.054		NS
	Cigarettes Smoking	5	0.84	0.062	0.028		
Duration of	None	24	0.865	0.070	0.014	0.308	0.870
Smoking /	1 - 3	2	0.840	0.028	0.020		NS
Years	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	<= 0	24	0.865	0.070	0.014	0.318	0.812
Smoking / Day	1 - 10	3	0.893	0.095	0.055		NS
	11 - 20	3	0.860	0.069	0.040		
	31+	2	0.830	0.071	0.050		

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

Table 6 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.

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

Regarding sex, the findings indicate that the male is the dominant gender. The results of the present study agree with a previous study which 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 these factors, making the 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 (Boura et al., 2023; Hamed & Shrief, 2021; Ogasawara et al., 2022). (Koto et al., 2024)

Concerning the level of education, the study results reveal that the highest percentage of the study sample was secondary school and college graduates. The results of the present study are consistent with a study conducted the majority 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 has an indirect effect on 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 (Alhawsawi et al., 2023; Bohamad et al., 2023).

Concerning marital status, the majority of subjects (78.10%%) are married. Several studies are in

agreement with the results of the present study that 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) (Bohamad et al., 2023; Hamed & Shrief, 2021)(Othman et al., 2024).

Regards to occupational status, the highest percentage was employees. These results are similar to other previous studies 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 (5, 6, 12).

Regarding residency, the current study results show that most of the sample live in urban areas. This result is in agreement with the previous study that indicated that the majority of GERD patients live in urban areas and the remaining are living 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, so they are less risky for GERD than urban residents. Furthermore, the rural residents live in a good environment in regard to noise, pollution, and psychological stressors, so they are less prone to get GERD because of the dangerous reasons that are common in town than in countryside areas e.g., psychological stress (Nirwan et al., 2020).

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

The study shows that most of the patients (75%) are non-smokers, and few of them (25%) are smokers, which is considered unhealthy behavior for GERD patients. In a previous study found that the majority of the study subjects were non-smokers. Furthermore, the use of tobacco can speed up the weak in the sphincter, leading to GERD (Abusalha, 2018).

Part II: Discussion patients' Knowledge about Dietary habits for Gastroesophageal Reflux Disease in study and Control Groups at (Pre-Post-Tests)

The findings of patients' knowledge regarding dietary habits 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.

Concerning the dietary habits have an important role in GERD, which is a multifactorial disease affected by both genetic predisposition and environmental factors. Obesity, nicotine, alcohol, carbonated drinks, caffeine or coffee, chocolate, onions, tomato sauce, mint, citrus fruits and their juices, and fatty and spicy meals aggravate GERD-related symptoms. Modifiable risk factors related to diet include long meal-sleep intervals, rate of eating, and quantity and temperature of food, and high-fat food intake reduces esophageal sphincter pressure and increases esophageal exposure to gastric fluids. While diets rich in vegetables, fiber, and antioxidants were not significantly associated with increased risk of GERD (Özenoğlu et al., 2023).

The findings of the current study revealed that the effect of the educational program on patients' knowledge regarding dietary habits domain in the study group was positive to identify the proper dieting behaviors that help them to maintain the management of their disease. This result is found to be consistent with the previous study in which that the Participants' overall knowledge about GERD was poor; above half of the participants had poor knowledge about the disease and diet regimens(Hamed & Shrief, 2021).

The researcher attributed that the patient's response to the educational program was very effective because of educational level and young age of the study sample contributed to increased knowledge of changing his eating habits and was the reason behind the impact of the program.

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

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 except the level of education was significant at p-value 0.014.

The results of the present study agreement with previous study that 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 (Bohamad et al., 2023).

This finding was agree with another study that 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)(Alhawsawi et al., 2023). In addition, the current study result agreed with another study revealed in the results 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 (Wang et al., 2016). Also, another study 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 highly statistically significant at p-value 0.0001. Briefly, Nurses play an essential role in decreasing patient's health condition deteriorated(5, 14).

Implications and limitations:

The current work can be used as a guideline for the nurses and helps them to implement educational program to enhancing patients' knowledge that reduce the patients' problems and improve their self-care, often GERD. Patients in this study showed a good interest in educational programs and not faced any challenges or difficulties or limitation.

Conclusion

The study concluded that the study program is an effective way to improve patients' knowledge regarding dietary habits after GERD was fair and There were improvements in patients' knowledge after the post-test for the study group after implementing an educational program regarding dietary habits after GERD. Meanwhile, the control group did not present any improvement in their knowledge regarding dietary habits after GERD at pre and post-test. Recommendation of the study based on the study's conclusion: Comprehensive and extensive population studies can be conducted to determine the effectiveness of other nursing education methods in improving knowledge, enhancing outcomes, and reducing complications, especially for patients with gastroesophageal reflux disease. And 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.

Acknowledgments

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