Article

Educational Program Boosts Constipation Knowledge in Coronary Artery Disease Patients

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Abstract: Constipation is a prevalent condition causing substantial morbidity and commonly presenting to healthcare providers, with associations reported between constipation and cardiovascular disease (CVD). This study aims to evaluate the effect of an instructional program on constipation knowledge in patients with coronary artery disease (CAD). Conducted at Nasiriyah Heart Center from January 2, 2023, to March 19, 2024, this quantitative, quasi-experimental study used purposive sampling to select 64 CAD patients with constipation. These were divided into a study group (n=32) and a control group (n=32). The program's content validity and the knowledge test were confirmed by a panel of 17 experts, and reliability was assessed using a test-retest approach. Statistical analysis using SPSS version 25 revealed highly significant differences in knowledge scores between pre- and post-tests and between the study and control groups (p<0.01). The study group's mean knowledge score improved from 1.56 to 2.50, while the control group's score remained virtually unchanged (1.57 to 1.62). The instructional program significantly enhanced patients' knowledge about constipation. The study recommends broad health education efforts on constipation, physical activity, dietary intake, and toileting habits through various media to elevate patients' knowledge.

Keywords: Instructional Program, Constipation's Knowledge, Coronary Artery Diseases.

1. Introduction

Constipation causes substantial morbidity worldwide and is one of the most prevalent conditions presenting to general practitioners, medical specialists and surgeons across subspecialties. In a studies conducted by the following authors [1,2] determined that once as the primary cause of mortality and disability globally, cardiovascular disease (CVD) poses an increasingly healthy and social burden with the world's population aging in view of the severe social and clinical consequences, prompt action was required to identify risk factors of CVD for early prevention and intervention. Genetic or environmental factors may lead to the occurrence and progression of CVD. Patients with CVD often have multiple chronic illnesses requiring multiple prescriptions [3].

In addition, some studies have indicated that constipation is probably associated with CVD. In fact, once the effectiveness of constipation on CVD risk were merely biased by shared pleiotropic factors or reverse causation due to the inherent defects of conventional observational studies [4]. According to projections, there would be a 146% increase in CAD mortality for women and a 174% increase for males in Middle Eastern countries between 1990 and 2020 [5]. Constipation is a prevalent worldwide health issue reported daily in clinical practice. The prevalence of constipation among patients hospitalized for cardiovascular disease is approximately 50% [6]. Constipation and cardiovascular diseases share common risk factors, including age, use of non-aspirin non-

steroidal anti-inflammatory drugs, diabetes mellitus, depression, lack of physical exercise and low dietary fiber intake [6,7].

However, a substantial proportion of cardiovascular diseases cannot be explained by traditional cardiovascular risk factors. Constipation may be a risk factor for cardiovascular diseases via several putative mechanisms. Disturbances in the gut microbiome are common in patients with constipation and have been associated with arterial stiffness, increased blood pressure, atherosclerotic cardiovascular diseases and heart failure [8]. Patients who experience acute illnesses and are treated in critical care units are at risk of constipation. Acute conditions and the treatment given can cause intestinal motility disorders. For example, gastric emptying has decreased in 50% of patients with ventilators, and 80% in head injury patients. Abdominal surgery, hemodynamic instability, scars, electrolyte disturbances, the use of active vasoactive or analgesic sedatives are the main causes of decreased intestinal motility [9].

2. Materials and Methods

A quasi-experimental design was used with the application of pre and post-test approach for both groups (study and control). This study applied in the Al-Nasiriya's Heart Center, spanning from 2th of January, 2023 to 19 March, 2024. A non- probability (purposive) sample had been selected of the sample divided into two groups each one consisted of patients as control group and study group. The study group was exposed face to face to the instructional program of constipation's knowledge while the control group was not exposed to the instructional program.

The sample was selected according to the following criteria: Patients with coronary artery disease who suffer from constipation, both male and female patients were eligible for participation, participants were required to possess the ability to communicate effectively and exhibit cognitive orientation regarding person, place, and time and hemodynamically stable, while Exclusion Criteria: Individuals with a history of long-term use of laxative agents were excluded, patients displaying cognitive impairment were not included in the study, individuals with a history of employing psychotropic agents were also excluded from participation, patients afflicted with hemorrhoids were ineligible for the study, those with diagnoses of heart failure or renal failure were not part of the study cohort, individuals who declined participation or subsequently withdrew from the study were omitted from the final analysis.

This part was constructed to assess patients ' knowledge about constipation. It consisted of questions for each question 3 options (I know), (I don't sure) and (I don't know). This part consistent of three domains: First domain: 6 items related to general information about constipation, second domain: 7 items related to nutrition and fluid intake, third domain: 2 items related to exercise and movement, fourth domain: 3 items related to medication use and fifth domain: 2 items related to abdominal massage. About 15-20 minutes were given for the test completion. The validity of the study instruments was determined by the panel of experts who had more than five years' experience in their field.

3. Results

The results of (table 1) provide a comprehensive overview of the patient characteristics in the context of coronary artery diseases. In the study group, the age of patients with an average age of (58.81±12.24) years, while in the control group with an average age of (60.18±10.57) years. Sex distribution revealed a predominant male presence in both the study group (53.1%) and the control group (62.5%). Marital status indicated a majority of married individuals in both the study group (56.3%) and the control group

(50%). When it comes to education level, the majority (25%) of patients in the study group and (31.3%) in the control group are secondary school graduate. Regarding occupation, a notable percentage of participants in the study group (31.3%) were retired, similar to the control group (34.4%). Residential characteristics showed that the majority of participants were urban residents in both groups, accounting for (87.5%) in the study group and (81.3%) in the control group.

In terms of smoking habits, a substantial portion of participants in both groups (62.5%) in the study group and (53.1%) in the control group reported smoking history. Lastly, the overwhelming majority of participants in both groups refrained from alcohol use, with (93.4%) in the study group and (93.8%) in the control group reporting no alcohol consumption.

Table 1. Distribution of Study Sample by their Socio-Demographic Variables (SDVs)

SDVs	Classification	Study Group		Control Group		χ^2	p-value	CS
		N	%	N	%			
Age	25 to 35	1	3.1	1	3.1	22.216	.569	NS
	36 to 45	4	12.5	3	9.4			
	46 to 55	6	18.8	5	15.6			
	56 to 65	9	28.1	12	37.5			
	66 to 75	12	37.5	11	34.4			
	Min.- Max.	32-73		34-75				
	Mean± SD	58.81±12.24		60.18±10.57				
Sex	Male	17	53.1	20	62.5	.219	.179	NS
	Female	15	46.9	12	37.5			
Marital status	Single	2	6.3	2	6.3	19.172	.621	NS
	Married	18	56.3	16	50.0			
	Separated	6	18.8	6	18.8			
	Widowed	4	12.5	7	21.9			
	Divorced	2	6.3	1	3.1			
Level of education	Illiterate	7	21.9	5	15.6	23.453	.865	NS
	Read and write	3	9.4	7	21.9			
	Primary school	5	15.6	3	9.4			
	Intermediate school	6	18.8	5	15.6			
	Secondary school	8	25.0	10	31.3			
	University	3	9.4	2	6.3			
Occupation	Self employed	7	21.9	6	18.8	12.275	.658	NS
	Government employ	6	18.8	5	15.6			
	Housewife	9	28.1	10	31.3			
	Retired	10	31.3	11	34.4			
Residents	Urban	28	87.5	26	81.3	1.466	.932	NS
	Rural	4	12.5	6	18.8			
Smoking	Yes	20	62.5	17	53.1	0.746	.876	NS
	No	12	37.5	15	46.9			
Alcohol use	Yes	2	6.3	1	3.1	0.588	.989	NS
	No	30	93.4	31	93.8			

No.= Number; %= Percentage; χ^2=Chi-square

Table (2) offer a significant proportion of individuals in both the study (59.4%) and (65.6%) control group reported past medical history of hypertension, it was observed that a majority of participants in both groups (37.5%) had no prior surgical procedures. In fluid intake, (62.5%) of study and control (53.1%) groups reported consuming less than 2500 ml of fluids daily. Likewise, when assessing fiber intake, a substantial percentage of individuals in both groups (65.6%) in the study group and (71.9%) in the control group indicated consuming 2-3 servings of fiber-rich foods daily. Interestingly, both the study (65.6%) and control (71.9%) groups exhibited a lack of physical activity and movement. With regards to cardiac medication the statins medication emerged as the primary type which used by participants in both the study (37.5%) and control (31.3%) groups. Lastly, in related to term constipation associated drugs, the majority of both groups (50%) study and (56.3%) of control were not used it.

Table 2. Distribution of Study Sample by their Clinical Characteristics

Clinical data	Classification	Study Group		Control Group		χ^2	p-value	CS
		N	%	n	%			
Past Medical History	Non-medical history	2	6.3	1	3.1	21.533	.986	NS
	Hypertension	19	59.4	21	65.6			
	Diabetes mellitus	7	21.9	5	15.6			
	Arrhythmias	2	6.3	4	12.5			
	HTN & DM	4	12.5	6	18.8			
	Valvular heart diseases	1	3.1	2	6.3			
	Others (COPD, cancer rheumatism, , renal failure, liver disease)	11	34.4	14	43.8			
Past surgical history	Non-surgical history	12	37.5	12	37.5	1.347	.125	NS
	Bypass surgery	3	9.4	5	15.6			
	Heart valve surgery	0	0.00	1	3.1			
	Angioplasty	7	21.9	9	28.1			
	Others (abdominal, chest, head, peripheral)	10	31.3	7	21.9			
Fluid intake	> 2500 ml/24 h	12	37.5	15	46.9	2.433	.895	NS
	< 2500 ml/ 24 h	20	62.5	17	53.1			
Fiber intake	1 daily	10	31.3	7	21.9	3.652	.165	NS
	2-3 daily	21	65.6	23	71.9			
	≥4 daily	1	3.1	2	6.3			
Active and movement	Inactive	21	65.6	23	71.9	2.453	.876	NS
	Low	8	25.0	7	21.9			
	Moderate	3	9.4	2	6.3			
Cardiac Medication	None	2	6.3	1	3.1	12.343	.412	NS
	Calcium channel blockers	4	12.5	2	6.3			
	Amiodarone	2	6.3	3	9.4			
	Statins	12	37.5	10	31.3			
	Beta-blockers	9	28.1	7	21.9			
	Aspirin	8	25.0	6	18.8			
	Anticoagulant	2	6.3	4	12.5			
Constipation associated drugs	None	16	50.0	18	56.3	11.213	.348	NS
	Antacids	6	18.8	3	9.4			
	Iron supplements	2	6.3	0	0.00			
	Non opioid analgesics	8	25.0	11	34.4			

No.= Number; %= Percentage; χ^2=Chi-square

Table 3. Comparison Between Study and Control groups in the Post Test According to The Knowledge Tests

Post-test	Study Group					Control Group				Sig.
	Class	n	%	M.s	Ass	N	%	M.s	Ass	
1. Constipation is a problem when your stomach feels bloated and may have a nausea.	I don't know	1	3.1	2.72	G	7	21.9	2.09	M	0.001
	Uncertain	7	21.9			15	46.9			
	I know	24	75.0			10	31.3			
2.With constipation you feel the urge to have a bowel movement but when you sit on the toilet happens.	I don't know	21	65.6	1.47	P	27	84.4	1.25	P	0.072
	Uncertain	7	21.9			2	6.3			
	I know	4	12.5			3	9.4			
3. Ignoring the urge to defecate is one of the causes of constipation	I don't know	0	0.0	2.84	G	11	34.4	2.13	M	0.000
	Uncertain	5	15.6			6	18.8			
	I know	27	84.4			15	46.9			
4. Have your feet flat on the floor or on a foot stool when you sit on the toilet.	I don't know	1	3.1	2.69	G	23	71.9	1.34	P	0.000
	Uncertain	8	25.0			7	21.9			
	I know	23	71.9			2	6.3			
5. Constipation and straining can cause elevation of blood pressure	I don't know	12	37.5	1.91	M	28	87.5	1.19	P	0.021
	Uncertain	11	34.4			2	6.3			
	I know	9	28.1			2	6.3			
6. Constipation may last for more than a week, which is normal	I don't know	0	0.0	3.00	G	11	34.4	2.00	M	0.003
	Uncertain	0	0.0			10	31.3			
	I know	32	100			11	34.4			
7. Drinking plenty of fluids is important to have a soft stool and prevent constipation.	I don't know	13	40.6	2.19	M	28	87.5	1.13	P	0.000
	Uncertain	0	0.0			4	12.5			
	I know	19	59.4			0	0.0			
8. Drink 6 to 8 cups (1.5 liters) of fluids a day when increasing your fiber intake.	I don't know	1	3.1	2.59	G	16	50.0	1.59	P	0.000
	Uncertain	11	34.4			13	40.6			
	I know	20	62.5			3	9.4			
9.Eat a high fiber diet with lots of vegetables and fruit, legumes and whole grain breads and cereals is a good way to prevent constipation	I don't know	0	0.0	2.72	G	11	34.4	1.84	M	0.000
	Uncertain	9	28.1			15	46.9			
	I know	23	71.9			6	18.8			
10. Soluble fiber also reduces the risk of diabetes, coronary and cerebrovascular disease.	I don't know	1	3.1	2.81	G	11	34.4	2.00	M	0.000
	Uncertain	4	12.5			10	31.3			
	I know	27	84.4			11	34.4			
11. Peach and kiwi juices are an alternative to constipation medications.	I don't know	1	3.1	2.91	G	13	40.6	1.97	M	0.000
	Uncertain	1	3.1			7	21.9			
	I know	30	93.8			12	37.5			
12. Increasing fiber too quickly or without drinking enough liquids may cause gas, bloating, cramping, diarrhea or constipation.	I don't know	10	31.3	1.91	M	27	84.4	1.22	P	0.002
	Uncertain	15	46.9			3	9.4			
	I know	7	21.9			2	6.3			
13. Fiber supplements can cause	I don't know	15	46.9			27	84.4			
13. Fiber supplements can cause	Uncertain	15	46.9			2	6.3			
	I know	2	6.3			3	9.4			

Item	Response									
14. Exercise and activity helps keep your bowels moving.	I don't know	0	0.0	2.84	G	19	59.4	1.56	P	0.000
	Uncertain	5	15.6			8	25.0			
	I know	27	84.4			5	15.6			
15. An increase in activity has been associated with less constipation, less bloating and better intestinal gas clearance	I don't know	0	0.0	2.78	G	19	59.4	1.53	P	0.000
	Uncertain	7	21.9			9	28.1			
	I know	25	78.1			4	12.5			
16. If you are taking medication for constipation, continue to get regular exercise and drink fluids.	I don't know	1	3.1	2.88	G	13	40.6	1.84	M	0.000
	Uncertain	2	6.3			11	34.4			
	I know	29	90.6			8	25.0			
17. It is best not to use herbal laxatives as the safety of these laxatives for constipation.	I don't know	3	9.4	2.28	M	27	84.4	1.16	P	0.000
	Uncertain	17	53.1			5	15.6			
	I know	12	37.5			0	0.0			
18. Excessive use of laxatives may lead to reliance on them for defecation and may make constipation worse	I don't know	1	3.1	2.88	G	11	34.4	2.13	M	0.000
	Uncertain	2	6.3			6	18.8			
	I know	29	90.6			15	46.9			
19. Abdominal massage helps treat constipation and reduce its symptoms	I don't know	1	3.1	2.44	G	17	53.1	1.59	P	0.000
	Uncertain	16	50.0			11	34.4			
	I know	15	46.9			4	12.5			
20. Bathing with warm water helps to relax, which has a positive effect in getting rid of constipation	I don't know	0	0.0	2.75	G	13	40.6	1.66	P	0.000
	Uncertain	8	25.0			17	53.1			
	I know	24	75.0			2	6.3			

Each items evaluated as Poor [P]=1-1.66, Moderate [M]=1.67-2.33, Good [G]=2.34-3

Table (3) reveal that, during the post-test, the study group exhibited strong responses to all the items related to constipation, with mean scores exceeding 2.34. However, there were exceptions for items 5, 7, 12, and 17, where responses fell within the moderate range, with mean scores ranging from 1.67 to 2.33. In contrast, the control group displayed poor responses on all the studied items during the post-test, with mean scores equal to or below 1.66, except for items 1, 3, 6, 9, 10, 11, 16, and 18, where the responses also fell within the moderate range, with mean scores ranging from 1.67 to 2.33. Additionally, there were statistically significant differences in knowledge scores between the study and control groups during the post-test period (p < 0.05).

Table 4. Comparison Overall Patients Knowledge towards Constipation between Pre-post-test in Study Group

	Periods	M± SD	Paired t- test	d.f	η^2	Sig.
Study Group Knowledge	**Pre-test**	**1.56± 0.296**	12.263	31	0.82	0.000
	Post-test	**2.50± 0.267**				

M: Mean, SD: Standard deviation, t: t-test, d.f: Degree of freedom, η2= Eta squared; Sig: Significance level at 0.05.

Table (4) demonstrate a highly significant differences in knowledge scores between the two measurement periods as pre-test (1.56 ± 0.296) and a post-test (2.50 ± 0.267). This differences are further highlighted by a large effect size of instructional program between pre-test and post-test (η2 = 0.82), indicating presence of significant differences (t = 12.263; p = .000).

4. Discussion

In table (1) the study group had an average age of (58.81) years, whereas the control group had a slightly higher average age of (60.18) years. The study reports a predominant male presence in both groups, with (53.1%) in the study group and (62.5%) in the control group being male. The majority of participants in both groups were married, with (56.3%) in the study group and (50%) in the control group. Results showed that (34.4%) of patients in the study group and (28.1%) of patients in the control group were secondary school graduate. The study found that a notable majority of participants in both groups were not work (housewife or retired), which could be linked to lifestyle factors. The majority of participants (>81%) in both groups were urban residents. The study shows that a substantial portion of participants in both groups reported smoking history, with (62.5%) in the study group and (53.1%) in the control group.

The overwhelming majority of participants in both groups refrained from alcohol use, with (93.4%) in the study group and (93.8%) in the control group reporting no alcohol consumption. Our finding is agreeing with Sumida et al, [10] that present the mean±SD age at baseline was 59.8±13.9 years. The current study results are consistent with those from AL-Najaf AL-Ashraf City, where most participants with hypertension who took part in the education program were men [11]. Our study supported by Ahmad and Alnaeem [12] who reported that most participants (81.8 %) were married.

Our results agree with Al-Fatlawi and Mohammad [13], who present that (44.4%) of seniors with constipation were in secondary school. These results were similar to the study reported that (56%) of patients were self-employed [14]. On the other hand, the results of one study included CAD patients Cardiac Centers in Baghdad City present that in both the control and intervention groups, a significant proportion of participants (30.0%) and (26.7%), respectively, were employed by the government [15]. This disagrees with another study at Baghdad Cardiac Centres that present (69 %) of CAD in rural areas [16]. Also, the results are similar to the finding by Hassan [17], who revealed that the majority (41.66%) of the smokers group are within the age group (50-59) of patients with CAD. Also results are similar to some aspects of a few previously published studies, Liu, Kang and Yan [18] who reported that (57.56%) of constipated patient were have history of smoking. Finally, our result agrees to Lee et al. [19] who reported in their study of constipation that (76.1%) were don't drink alcohol. In table (2) A significant proportion of individuals in both the study group (59.4 %) and the control group (65.6%) reported past medical history of hypertension.

This finding is in line with a study that found each of the experimental and control groups had hypertension, which was present in 62% of the experimental group and 72% of the control group, correspondingly [20]. Another study was conducted on patients with cardiovascular disease (81%) of precipitants with chronic diseases [21]. Most participants in both groups (62.5%) in the study group and (53.1%) in the control group reported consuming less than 2500 ml of fluids daily. This is supported by Zukhri et al. [22] study show that inadequate fluid intake (less than 2500 ml/24 hrs) independently contribute to a 21.33 % to the occurrence of constipation in acute coronary syndrome (ACS). A substantial percentage of individuals in both groups (65.6%) in the study group and (71.9%) in the control group indicated consuming 2-3 servings of fiber-rich foods daily.

This supported by Ali et al. [23] who was mentioned that consumption of fibers was assessed as a possible risk factor for constipation, and (75.2%) participants consumed two or fewer pieces of fibers daily. Interestingly, both the study group (65.6%) and the control group (71.9%) exhibited a lack of physical activity and movement. Cevik and Zaybak [24] presented that (53.4%) of elderly with constipation did not have enough activity. Statin medication was the primary type of medication used by participants in both the study group (37.5%) and the control group (31.3%). This agree with Dahlmann et al. [25] who reported that most heart disease patient with constipation (76%) were take statin drug. Patients who had a bowel movement once every two to three days were shown to be considerably more at risk of age-adjusted mortality from ischemic stroke, total stroke, and coronary heart disease than patients who had a bowel movement every day (26). Healthy Lifestyle is cornerstone of human health, which has well-demonstrated role to reduce "all-cause mortality "and to maintain health and wellbeing of individuals (27). Patient's knowledge about educational program were increasingly

enhanced after applying the program (28, 29). The study found highly significant differences in knowledge scores between the two measurement periods, namely the pre-test (1.56 ± 0.296) and the post-test (2.50 ± 0.267).

5. Conclusion

The health educational program given to patients with coronary artery diseases improves their knowledge and practices with regard to self-care management about constipation. Health education about constipation, physical activity, suitable dietary intake and toileting habits through mass media, TV, radio, and magazine is necessary. A simplified booklet about constipation (symptoms, physical activity and suitable diet) must be provided in the library of geriatric clubs.

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