Effect of Instructional Guidelines on Life Style Modification for Patients after Coronary Angioplasty and Stent

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Abstract   **The aim** of the study was to evaluate the effect of nursing instruction guidelines on life style modification for patients after coronary angioplasty and stent. **Hypothesis:** The knowledge of patients about coronary artery disease, stent and practices will improve after receiving the nursing instructions and the patients will adopt healthy life style after receiving these instructions. **Design:** Quasi experimental design used. **Setting:** The study was done at Menofiya's University Hospital. **Subjects:** Convenience sample of 65 patients from both genders. **Tools:** Two tools were designed; 1) Structured questionnaire regarding knowledge of coronary angioplasty and stent. 2) Assessment of patient's practices of healthy life style and avoiding risk factors. **Results:** The results of the study revealed that 70.8% of patients were male, 46.2% of age between 50- 60, 35.4% were illiterate / read and write, 50.8% worked with physical effort, 72.3% from rural places and 78.5% were married. There were statistical significant improvement in the total level of knowledge and practices among patients after one month post coronary angioplasty and stent (p≥0.05). Also, there were modification of life style and improvement in all practices related to avoiding of risk factors after one month post coronary angioplasty and stent. **Conclusion:** The results of study revealed that the instruction guidelines has a significant effect on the improvement of knowledge, modification of lifestyle and all practices related to avoiding of risk factors among patients after one month post coronary angioplasty and stent. **Recommendations:** Further research is necessary to measure long term adherence to healthy life style among patients with coronary angioplasty and stent.

Keywords: coronary artery disease, life style, coronary angioplasty, stent

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1. Introduction

Coronary artery disease (CAD) is the most common cause of mortality related to cardiovascular diseases. According to the latest WHO data published in May 2014 coronary heart disease deaths in Egypt reached 107,232 or 23.14% of total deaths, the age adjusted death rate is 186.36 per 100,000 of population ranks Egypt #23 in the world [1]. Risk factors that increase the chance for developing coronary artery disease (CAD) including, family history, increasing age, gender being male, high cholesterol, obesity, smoking, alcohol consumption, hypertension, diabetes, physical inactivity, low intake of fruit and vegetables and psychosocial factors. [2]. Changing lifestyle with appropriate drug therapy is the only way to slow down the disease process and decrease risk factors [3,4].

Coronary angioplasty and stent are the most common procedures for coronary artery disease but it cannot alter the underlying causes of CAD. Balloon angioplasty remain integral to percutaneous coronary intervention PCI for predilation of lesions before stent placement, deployment of coronary stents, and further expansion of stents after deployment. Coronary stents have emerged as the predominant form of PCI and currently used in more than 90% of PCI procedures worldwide. Coronary stent lowering the incidence of vessel closure and need for emergency surgery and lessen the frequency of restenosis because of their effect on preventing arterial constriction that is the primary mechanism of restenosis with balloon angioplasty [5].

Modification of life style and CAD risk factors needs health information [20]. A healthy diet, regular exercise, avoiding smoking, depression and other psychosocial behavior, provide benefits to patients with CAD thus patient education regarding lifestyle changes, implementation strategies and follow up on an ongoing basis to optimize secondary prevention. Effective coronary revascularization and drug therapy should be completed by enhanced efforts to identify and modify risk factors and their underlying causes [6].

Health education is an essential component of treatment as patients spend only a short time. Cardiac education can improve knowledge, awareness, attitudes, and beliefs for

adherence to healthy lifestyle [12]. Adjusting risk factors in a constructive direction can lower the risk for CAD [7]. Particularly adjusting and monitoring changeable factors such as smoking, obesity, hypertension, diabetes, hypercholesteremia and lack of physical activity. Therefore, having knowledge regarding CAD risk factors and life style changes is vital to improve patient's adherence to healthy lifestyle to facilitate return to work and to practice healthy life style following to angioplasty and stent procedure, after stent the patients are discharged from the outpatient interventional cardiology practice then instructed to avoid excessive movement of the limb where the puncture was performed for the next two days to prevent bleeding after procedures, avoid carrying heavy objects or bicycle rides or hikes for two weeks [19], Therefore it is important to give nursing instruction guidelines on life style modification for patients with coronary angioplasty and stent.

2. Aim of the Study

The study aimed to evaluate the effect of nursing instruction guidelines on life style modification for patients after coronary angioplasty and stent, this aim will be achieved through the following:

- Assessing patient's knowledge of coronary diseases and stent.
- Developing and implementing instructions guidelines for the studied patients.
- Evaluate the effect of implementing the nursing instruction guidelines on patient's knowledge, life style and risk factors after coronary angioplasty and stent.

2.1. Study Hypothesis

1. The knowledge of patients about coronary artery disease, stent and practices will improve after receiving the nursing instructions.
2. The patients will adopt healthy life style after receiving the nursing instructions.

3. Subjects and Method

3.1. Research Design

Quasi experimental design used to achieve the aim of the study.

3.2. Research Setting

The study was conducted at Menofiya's University Hospital

3.3. Research Subjects

Convenience sample of 65 patients from both genders selected under the following criteria:

1. Accept to participate in the study.
2. Scheduled for non-emergency stent.
3. Undergoing stent for the first time.

3.4. Tools of Data Collection

Two tools were designed to collect data

Tool (I): Structured questionnaire regarding knowledge of coronary angioplasty and stent; which was developed by the researchers to assess patient's knowledge about coronary angioplasty and stent. It included four parts;

A. Sociodemographic characteristics of the patients: as age, gender, marital status, educational level, residence and occupation.

B. Medical history of the patients: it was developed to assess past and present medical history of the patients such as: hypertension, diabetes mellitus, high cholesterol levels, obesity, and family history of CAD.

C. Patient's Knowledge about coronary disease and stent including: Meaning of coronary artery diseases, causes, diagnosis, treatment, complication, meaning of stent, types, uses, site and precautions.

D. Patient's Knowledge about precautions after coronary angioplasty and stent including: care of the puncture site, bathing, moving, return to work and driving.

Scoring system:

Each item was scored 3 for correct and complete answer and 2 for correct but not complete answer and 1 for wrong answer. The total score of all questions will be represented in 100% and categorized into two levels, unsatisfactory (<60%) and satisfactory ($\geq$ 60%).

Tool (II): Assessment of patient's practices of healthy life style and avoiding risk factors: It was developed by the researchers after reviewing the related literature to assess the patient's practices pre and one month after coronary angioplasty and stent. It included nutritional habits, Precaution during practicing exercise, avoid active and passive Smoking, monitor weight and avoid obesity, avoid stressful situation, medication as prescribed, control of blood pressure and continuous health checkup.

Scoring system:

Each item was scored 3 for always adoption to the behavior and 2 for some times adoption to the behavior and 1 for rarely adoption. The total score of all questions will be represented in 100% and categorized into two levels, unsatisfactory (<60%) and satisfactory ($\geq$ 60%).

3.5. Tools Validity and Reliability

The experts check the relevancy, clarity, comprehensiveness and applicability of the tools. According to their opinions appropriate modifications were done by five professions and experts of medical-surgical nursing in the faculty of nursing and medicine at Benha University. Reliability was done by cronbach, alpha test (0.87).

3.6. Pilot Study

A pilot study was carried out on 6 patients to test the content of the questionnaire as well as to estimate the time needed for data collection and the necessary modifications were done. Patients who shared in the pilot study were excluded from the study sample.

3.7. Ethical Considerations

The purpose of the study was explained to the patients and informed consent was obtained from them to participate in the study. They were given an opportunity to withdraw from the study without given a reason, they were assured that anonymity and confidentiality of information was protected. Ethics, values, culture, and beliefs were respected.

3.8. Field Work

Preparatory phase (Designed nursing instructions guidelines)

It was developed by the researchers after review of literatures, then revised and modified according to the expertise comments, it was written in clear, Arabic language with pictures, colours and it included the following instructions:

Information about meaning of coronary artery diseases, causes, diagnosis, treatment and complication.

Information about coronary stent; types, uses, sites and precautions.

Information about precautions after procedures including; care of the puncture site, bathing, moving and return to work and driving.

Information about modification of life style and avoiding risk factors including: Nutrition, precaution during practicing exercise, avoid active and passive Smoking, monitor weight and avoid obesity, avoid stressful situation, medication as prescribed, control blood pressure and continuous health checkup.

Assessment phase:

At the beginning the researchers visited the catheterization department to collect necessary data about working days (from Sunday to Thursday), frequency of cases (about 8 to 10 cases per day) and get the agreement to conduct the research (the chief of the department select Sunday and Tuesday to collect data).

The researchers meets the patient before catheterization at registration time (8 am to 10 am) and introduces himself; explain the aim of the study to each patient to gain their cooperation to share in the study.

The researchers initiated data collection by interviewing each participant for assessing socio-demographic data, medical and family history by using a structured interviewing questionnaire. Also, each patient was asked to answer certain questions to evaluate his knowledge about coronary disease, stent, instructions after procedure and healthy life style. The average number per day around 2-4 patients and each patient took an average 10-15 minutes.

Implementation phase

The intervention program was developed and implemented for the studied patients. They attended two sessions; the first was before catheterization and included health education about practices after the procedure. The duration of the session was 15-20 minute

Second session which included general information about coronary artery diseases (definition, causes, diagnosis, treatment strategies and complication), stent (definition. Sites, types, uses), healthy life style and risk factors. This session was conducted before discharge.

Each session followed by a summary of essential points. The teaching media included an illustrative structured coloured booklet.

Evaluation phase

At the end of intervention period post-test was performed by using the same pretest tools.

3.9. Statistical Analysis

Upon completion of data collection through the previously mentioned tools, data were computed and analyzed using the Statistical Package For Social Sciences (SPSS), version 22.0.0.0. Data were presented in tables using numbers, percentages, X2 and P value. Level of significance was threshold at 0.05.

4. Results

Table 1 shows that 70.8% of patients were male, 46.2% of age between 50- 60, 35.4% was Illiterate / read and write, 50.8% worked with physical effort, 72.3% from rural places and the majority were 78.5% married.

Table 1. Frequency distribution of studied sample according to their socio demographic characteristics (N= 65)

Sociodemographic characteristics	Number	%
Gender		
Male	46	70.8
Female	19	29.2
Age		
40- 50	21	32.3
> 50- 60	30	46.2
> 60	14	21.5
Educational level		
Illiterate / read and write	23	35.4
Elementary	15	23.1
Secondary	18	27.7
University	9	13.9
Type of work		
physical effort	33	50.8
Office based work	12	18.5
No work	20	30.7
Residence of place		
Rural	47	72.3
Urban	18	27.7
Marital status		
Married	51	78.5
Single	5	7.7
Widowed/Divorced	9	13.8

Table 2 reveals that 50.8% of studied sample had hypertension, while 15.4% had diabetes and 33.8% had family history to CAD. The table also shows that 47.6 were obese and 41.5 had high cholesterol level.

Table 2. Distribution of Studied Sample regarding their medical and family history (N= 65)

Item	Number	%
Hypertension	33	50.8
Diabetes	10	15.4
High cholesterol levels	27	41.5
Obesity	31	47.6
Family history for CAD	22	33.8

Table 3. Frequency distribution of studied sample according their knowledge about coronary diseases and stent

Items	Pre		After 1 month	
	N	%	N	%
Meaning of coronary artery diseases				
Complete and correct	12	18.5	31	47.7
Correct and not complete	24	36.9	29	44.6
Didn't know	29	44.6	5	7.7
Causes of the diseases				
Complete and correct	9	13.8	52	80
Correct and not complete	17	26.1	10	15.4
Didn't know	39	60	3	4.6
Diagnosis				
Complete and correct	12	18.5	55	84.6
Correct and not complete	22	33.8	7	10.8
Didn't know	31	47.7	3	4.6
Treatment				
Complete and correct	11	16.9	48	73.8
Correct and not complete	46	7.8	15	23.1
Didn't know	8	12.3	2	3.1
Complication				
Complete and correct	3	4.6	39	60
Correct and not complete	26	40	18	27.7
Didn't know	36	55.4	8	12.3
Definition of stent				
Complete and correct	6	9.3	46	70.8
Correct and not complete	33	50.8	12	18.5
Didn't know	26	40	7	10.8
Types of stent				
Complete and correct	5	7.7	57	87.7
Correct and not complete	11	16.9	6	9.2
Didn't know	49	75.4	2	3.1
Uses of stent				
Complete and correct	7	10.8	31	47.7
Correct and not complete	45	69.2	25	38.5
Didn't know	13	20	9	13.8
Sites				
Complete and correct	6	9.2	53	81.5
Correct and not complete	59	90.8	12	18.5
Didn't know	0	0	0	0
Precautions				
Complete and correct	15	23.1	23	35.4
Correct and not complete	28	43.1	42	64.6
Didn't know	22	33.8	0	0

Table 4. Frequency distribution of studied sample according their knowledge about precautions after coronary angioplasty and stent: (n:65)

Items	Pre		After 1 month	
	N	%	N	%
Care of the puncture site				
Complete and correct	10	15.4	33	50.8
Correct and not complete	25	38.5	32	49.2
Didn't know	30	46.2	0	0
Bathing				
Complete and correct	3	4.6	49	75.4
Correct and not complete	15	23.1	16	24.6
Didn't know	47	72.3	0	0
Moving and return to work				
Complete and correct	0	0	59	90.8
Correct and not complete	15	23.1	6	9.2
Didn't know	50	76.9	0	0
Driving				
Complete and correct	1	1.5	2	3.1
Correct and not complete	12	18.5	63	96.9
Didn't know	52	80	0	0

Table 3 illustrates improvement in all items of knowledge after one month post coronary angioplasty and stent.

Table 4 shows frequency distribution of studied sample according their knowledge about precautions after

coronary angioplasty and stent: the table illustrates an improvement in patient's knowledge after one month.

Table 5: Frequency distribution of studied sample according to their total level of knowledge pre and one month after coronary angioplasty and stent, the table shows that 36.9% of studied sample had satisfactory knowledge before intervention compared to 78.5% of them had satisfactory knowledge after one month of the intervention.

Table 6: Frequency distribution of studied sample according their life style and risk factors pre intervention. Regarding nutrition, 32% of studied sample always eat small frequent meals and 40% sometimes avoid animal fat, while 49.2% rarely use dairy products that are low in fat

and 69.2% eat fruits and vegetables rarely. In relation to practicing exercise 26.1% always avoid exercise in hot weather. Also shows that 58.5, 69.2 and 63.1 always avoid active and passive smoking, take medication as prescribed and control blood pressure respectively. Also 50.8% always checkup their health continuously.

Table 5. Frequency distribution of studied sample according to their total knowledge pre and one month after coronary angioplasty and stent

Items	Pre		After one month		x^2	P value
	N	%	N	%		
Satisfactory	24	36.9	51	78.5	22.9	.00001
Unsatisfactory	41	63.1	14	21.5		

Table 6. Frequency distribution of studied sample according their life style and risk factors pre intervention

Item	Always		Some times		Rarely	
	N	%	N	%	N	%
Nutrition						
Eat small meal distributed during the day	21	32.3	18	27.7	26	40
Avoid animal fat	15	23.1	26	40	24	36.9
Using unsaturated fat like olive oil	10	15.4	18	27.7	37	56.9
Using dairy product that are low in fat	6	9.2	27	41.5	32	49.2
Decreasing salt in food	13	20	13	20	39	1.5
Eating fruits and vegetables	15	23.1	5	7.7	45	69.2
Precaution during practicing Exercise						
Practicing exercise prescribed by doctor.	8	12.3	9	13.8	3	4.6
Warm up before start	11	16.9	4	6.1	5	7.7
Avoiding exercise after eating	9	13.8	10	15.4	1	1.5
Avoiding exercise in hot weather	17	26.1	2	3.1	1	1.5
Avoiding exercise in case of fatigue	15	23.1	3	4.6	2	3.1
Avoid active and passive Smoking	38	58.5	17	26.1	10	15.4
Monitor weight and avoid obesity	16	24.6	30	46.1	19	29.2
Avoid stressful situation	10	15.4	33	50.8	22	33.8
Medication as order	45	69.2	14	21.5	6	9.2
Control blood pressure	41	63.1	15	23.1	9	13.8
Continuous health check up	33	50.8	19	29.2	13	20

Table 7. Frequency distribution of studied sample according to their total level of practice of healthy life style and avoiding risk factors pre and one month after coronary angioplasty and stent

Items	Pre		After one month		x^2	P value
	N	%	N	%		
Satisfactory	19	29.2	43	66.1	17.7	.00002
Unsatisfactory	46	70.8	22	33.8		

Table 7 shows that 29.2% of patients had satisfactory practices before intervention compared to 66.1% of them had satisfactory practices after one month of the intervention.

Table 8 reveals that there are significant statistical differences between age and educational level with satisfactory level of knowledge while there are no significant statistical differences between sex and residence of place with satisfactory level of knowledge.

Table 8. Correlation between socio-demographic items of studied sample and their satisfactory knowledge pre and post intervention

Socio-demographic Items		Satisfactory knowledge				CHI	P
		Pre 24		Post 51			
Sex							
Male	46	16	34.7	35	21.8	.028	.865
Female	19	8	42.1	16	84.2		
Age							
40- 50	21	16	76.1	19	90.4	5.95	.046
> 50- 60	30	5	16.6	22	73.3		
> 60	14	3	21.4	10	71.4		
Educational level							
Illiterate	23	3	13.04	14	60.8	8.5	.03
Elementary	15	1	6.6	12	80		
Secondary	18	14	77.7	16	88.8		
University	9	6	66.6	9	100		
Residence of place							
Rural	47	18	38.2	34	72.3	.53	.46
Urban	18	6	33.3	17	94.4		

Table 9. Correlation between socio-demographic items of studied sample and their satisfactory life style pre and post intervention

Socio-demographic Items		Satisfactory practice				CHI	P
		Pre 19		Post 43			
Sex						.05	.82
Male	46	15	32.5	35	76		
Female	19	4	21	8	42.1		
Age						1.02	.6
40- 50	21	11	52.3	20	95.2		
> 50- 60	30	5	16.6	17	56.6		
> 60	14	3	21.4	6	42.8		
Educational level						3.3	.34
Illiterate	23	2	8.6	9	39.1		
Elementary	15	3	20	10	66.6		
Secondary	18	6	33.3	15	83.3		
University	9	8	88.8	9	100		
Residence of place						4.4	.03
Rural	47	6	12.7	26	55.3		
Urban	18	13	72.2	17	94.4		

Table 9 reveals that there are no significant statistical differences between socio-demographic characteristics with total satisfactory level of life style unless with residence of place (p .03).

5. Discussion

Cardiovascular disease is a leading cause of death in many western and developing countries. Large number of deaths can be reduced by modifying risk factors and adherence to healthy life style and this issue need greet effort to improve knowledge of patients [8]. Therefore the study aimed to evaluate the effect of nursing instruction guidelines on life style modification for patients after coronary angioplasty and stent.

The study revealed that the majority of the patients undergoing coronary angioplasty and stent were male and in age group > 50- 60, illiterate / read and write, worked with physical effort, from rural places and married. This may attributed to more stressors they had. The results of study in line with [9] who studied the impact of designed nursing educational protocol on health promotion for patients undergoing coronary artery stent outcome which found that the majority of the patients were in age group 50-60 years old , has low educational level and males. In the same line [10] which showed that 64% of the study subjects were males and their mean age were 59.7% years old.

The result revealed 50.8% of studied sample had hypertension, 15.4% had diabetes and 33.8% had family history to CAD. Also, 47.6 were obese and 41.5 had high cholesterol level. In agree with [11] who reported that cardiac catheterization is more common with patients suffering from ischemic heart disease and coronary heart disease associated with hypertension, diabetes mellitus and renal diseases.

Regarding the effect of instruction guidelines on patient's knowledge, the results of study revealed that there was significant improvement in the total level of knowledge after implementing the instruction guidelines one month after coronary angioplasty and stent included knowledge related to CAD, stent and knowledge about precautions after stent placement. This result supported by [12] who studied the effects of cardiovascular disease prevention program on knowledge and healthy lifestyle in Jordanian working adult. They revealed that the knowledge and adherence to healthy lifestyle significantly improved after one month after the program application. In the same line [13] who revealed that patient's knowledge improved after exposure to designed early ambulation protocol compared to a control group. Also, [14] who revealed that the cardiac educational program has a significant impact on improving both knowledge and adherence to healthy lifestyle among patients with CAD.

Regarding the relationship between socio-demographic characteristics of the studied sample and satisfactory level of knowledge pre and post intervention. The result revealed that there are significant statistical relation between age and educational level with satisfactory level of knowledge and this may be because age and educational level are important factors in level of knowledge, This results supported by [8] who aimed to explore the educational intervention for patients with CAD at the north of Jordan toward healthy lifestyle. They revealed that the level of education and age could be vital factors in affecting the level of knowledge. While there are no significant statistical differences between sex and residence of place with satisfactory level of knowledge as sex and residence has no effect on level of knowledge.

Regarding the effect of the nursing instructions on patient's practices of healthy life style and avoiding risk factors, the results revealed that about one third of studied sample had satisfactory practices before the instructions compared to two thirds of the studied subjects had satisfactory practices after implementing the instruction guidelines one month after coronary angioplasty and stent. There is significant improvement in the total level of practices after intervention. This improvement is due to improved level of knowledge because having knowledge about healthy lifestyle is considered a prerequisite for having the right and appropriate practice. The results of study are supported by [15] who aimed to determine the effectiveness of a lifestyle modification program on knowledge, attitude and practice of hypertensive patients with angioplasty. They showed that the educational lifestyle modification program has been effective on knowledge, attitude and practice of patients with high blood pressure who had undergone angioplasty. In the same line [12] indicated that subjects who were offered the intervention program significantly improved their health responsibility, nutritional behaviors and interpersonal

relationships. Also, [16] revealed that lifestyle change program with routine post angioplasty rehabilitation for patients who had undergone angioplasty, significantly improved dietary, smoking behavior and blood glucose. In addition to blood pressure and physical activity significantly improved in the 3 weeks after discharge.

Relate to the relationship between socio-demographic characteristics of the studied sample and total level of satisfactory practices of modified healthy life style and risk factors pre and post instruction guidelines. The results of study revealed that there are no significant statistical relation between socio-demographic characteristics with total satisfactory level of practices unless with residence of place in contrast with [17] who studied interaction between income and education in predicting long-term survival after acute myocardial infarction. They found that the improvement in the level of adherence to healthy lifestyle was due to the fact that a significant portion of the sample is highly educated and [18] who studied correlates of health behaviors in patients with coronary artery disease revealed that age, education, significantly affected health behaviors. In relation to residence may be due to the place in which the patient live is important factor in adherence to healthy life style.

6. Conclusion

The results of study revealed that the instructions guideline has a significant effect on the improvement of knowledge, all practices related to lifestyle modification and avoiding of risk factors among patients with coronary angioplasty and stent after one month post coronary angioplasty and stent,

7. Recommendations

Further research is necessary to measure long term adherence to healthy life style among patients with coronary angioplasty and stent

More educational programs for patients and health care providers are needed about risk factors and prevention methods of coronary artery diseases

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