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Learning Needs of Geriatric Patients Undergoing Percutaneous Coronary Interventions

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Abstract
Background: *A focused evaluation of learning needs with a better determination of time during admission for percutaneous coronary interventions (PCI) is urged for elderly patients. When elderly patients' learning needs are not met, there is an insufficient treatment, decrease in coping ability and increase in anxiety.*
Aim of the current study *was to Identify learning needs of elderly patients undergoing PCI.*
Method; *A descriptive research design was used to conduct this study at the Cardiac Catheterization Unit in the Specialized-Medical Hospital affiliated to Mansoura University Hospital. A purposive sample of 108 elderly patients undergoing PCI who met the inclusion criteria. Tools Socio-Demographic characteristics& Health Profile Structure Interview Schedule and Percutaneous Coronary Intervention Learning Needs Inventory were used to collect data.*
Results*: The result indicates more than one half of studied elders (57.4%) had moderate level of learning needs, (41.7%) had high level and only (0.9%) had low level. the level of learning needs was found to be higher in female, those with lower level of education, those who didn't work before retirement and those without fixed income.*
Recommendation*: There is an increasing need to design educational program for elderly patients undergoing PCI that should based on their learning needs in order to enhance elderly patients to play an active role in their treatment and prevent complications*
Keywords: *Elderly patients, Learning needs, Percutaneeous coronary interventions.*

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I. Introduction

Coronary heart disease (CAD) is the most frequent single cause of death among persons over 65 years of age and it seems to continue to be a significant threat to the health and wellbeing of the elderly population all over the world. It happens when the coronary arteries become hardened and narrowed due to the buildup of plaque on their inner walls [(1)].The prevalence and severity of CAD increase with age [(2)]. In adjunction to medical therapy, percutaneous coronary intervention (PCI) is the most used invasive treatment for CAD [(3)]. Over the past decade the willingness to consider PCI has increased, even among those of advanced age. In contemporary practice, almost 25% of all PCI are performed in patients aged ≥75 years and 12% are performed in those aged ≥80 years [(4)]. In Dakahlia governorate in a period from 2014 to 2015 the number of cases performed coronary angiography in specialized medical hospital was 2545 case, about (25%) 636 case of them was elderly[(5)]. Percutaneous coronary intervention is performed to open blocked coronary arteries caused by CAD and to restore arterial blood flow to the heart tissue without open-heart surgery [(6)]. It improves prognosis, relieve symptoms, reduce ischemic events, and improve functional capacity in a relatively low-risk procedure with a rapid recovery [(7)].

The elderly have more cardiovascular risk factors and a greater burden of ischemic disease than younger patients needing PCI and, therefore, derive greater benefit from revascularization. However, they are also more likely to experience procedural complications, owing to age-related physiological changes, frailty, and comorbidities [(4)].

Early discharge from the hospital means that the elderly patients need to continue care at home. Appropriate discharge information given to elderly patients and families can manage the gap of this care in the home setting. It was found that elderly patient-focused, nurse-delivered discharge information increases self-

care adherence, improves the clinical outcome and reduces the cost of care. Successful self management for recovery at home can be ensured by meeting the elderly patients' learning needs prior to hospital discharge [8].

II. Methodology

2.1 Aim;

The aim of the study was to identify learning needs of elderly patients undergoing percutaneous coronary intervention.

2.2 Research questions;

1. What are the learning needs among elderly patients undergoing percutaneous coronary intervention in priority?
2. What are factors affecting the learning needs of elderly patients undergoing percutaneous coronary intervention?

2.3Research design;

A descriptive research design was used in this study.

2.4 Setting;

Cardiac Catheterization Unit in the Specialized-Medical Hospital affiliated to Mansoura University Hospital, in Dakahila Governorate.

2.5 Participants;

A purposive sample of 108 elderly patients undergoing percutaneous coronary intervention, at previously mentioned above setting. Sample size calculated using https: // www. dssresearch.com / knowledge center/ toolkit calculators / sample size calculators.aspx(9), at 30 \ 5 \ 2016 , at alpha error of 5.0% (95% confidence interval) and beta error of 20.0% (80% statistical power) , the calculated sample size was (97) elderly patient. By adding 10 % for improving data collection, so the sample size was (108) elderly patients.

2.5.1 inclusion criteria

Age 60 years old and above, elderly patients admitted to hospital for undergoing percutaneous coronary interventions; agree to participate in the study and able to communicate.

2.5.2 exclusion criteria

Malignant tumor or other diseases at the terminal stage and elderly patients diagnosed with psychiatric disorder.

2.6 Tools;

two tools were used for data collection in this study as the following;

2.6.1 Tool I: Socio-Demographic characteri-stics & Health Profile Structure Interview Schedule

This tool consisted of two parts

Part I: Consisted of socio-demographic characteristics (e.g age, gender, marital status, occupation before retirement, source of income, educational level).

Part II: Health profile, it consisted of current diagnosis, present history, past history, family history, previous surgery, previous percutaneous coronary interv-enetions, current medications and number of hospital admission.

2.6.2 Tool II: Percutaneous Coronary Inter-vention Learning Needs Inventory:

This tool adapted from Cardiac Patient Learning Need Inventory (CPLNI) that was developed by Gerard in 1984. The content of questionnaire was evaluated by a group of experts including two specialists of CHD, two coronary care unit nurses and four cardiac ward nurses (Aroesty, 2013; Levine et al., 2011). The overall Cronbach's Alpha coefficient of the inventory was 0.92, while the reliability of the inventory was ranged from r = 0.80 – r = 0.84.The percutaneous coronary intervention learning needs inventory was composed of four categories (general knowledge of coronary heart disease, percutaneous coronary intervention knowledge: pre-procedural, postprocedural, post-discharge), divided into (7) items for the first domain, (9) items for the second domain, (5) items for the third domain and (3) items for the fourth domain. The score of importance from 1 to 4 was used in each item to represent from the least to the most important with response options of not important (1), slightly important (2), moderately important (3), extremely important (4) [10]. The total and subscale scores were computed by summing all items in those categories, then averaging by the total number of items. Thus, the possible ranges of scores were similar, ranging from 1-4. This can be further categorized in three levels as follows:$1 \leq 2$ is low level (least important), $> 2 \leq 3$ is moderate level (moderately important), and >3–4 is high level (highly important) [11].

2.7 Validity and reliability of the instruments

Tool I (Socio-Demographic char-acteristics & Health Profile Structure Interview Schedule) was tested for its content validity by a jury of five experts in the field of the study (four were nurse professors working with faculty of nursing and one was medical professor working with faculty of medicine) who had expertise in developing such instruments and the necessary modification was done.

2.8 Pilot study

A pilot study was carried out on a sample of 10 elderly patients attending the cardiac cathet-erization unit of the specialized medical hospital, Mansoura University, to evaluate ambig-uity, clarity and applicability of the tool and the approximate time needed for the interview. Accordingly, the necessary corr-ections and adjustments were done. Then designed tool was modified. The number of pilot study was excluded from the study sample.

2.9 Ethical considerations:

Ethical Approval was obtained from the research ethics committee of the Faculty of Nursing – Mansoura University.Patient's written consent to participate in the study was obtained, verbal consent was also accepted after explanation the aim and the nature of the study.Elderly patients were assured that their identities and responses to the questionnaire were confiden-tial, answering was voluntary.Every elderly patient was interviewed individually to collect the necessary data using all the study tools. Elderly patients were informed that their participation was voluntary and they can withdraw from the study at any time.

2.10Field of work

An official permission was issued from the Faculty of Nursing, Mansoura University to carry out the study and interview the elderly patients in the selected governmental hospital.An official letter was issued with approval from the director of the hospital after explanation of the purpose of the study and the schedule of data collection.After obtaining permission from the Director, the researcher met the head of the cardiovascular department, he was then introduced to the medical and nursing staff of in-patient and out-patient departments and asked for permission to collect data and explained the study objective. Tool I (Socio-Demographic charact-eristics & Health Profile Structure Interview Schedule) was developed by the researcher after a thorough review of related literature.Tool II (Percutaneous Coronary Intervention Learning Needs Inventory) was translated by the researcher into Arabic language. Based on the schedule of the cardiac catheterization unit included in the study setting, the researcher visited the unit on Saturday, Sunday, Thursday, and Wednesday weekly from 7 am to 11 am, and all elderly patients who fulfill the study criteria were included in the study. The researcher started the inte-rview by introducing himself and the purpose of the study and ensures that the patient is seated comfortably. After providing an explanation for the purpose and nature of the study, the researcher emphasized to the patients that they have the right to withdraw at any time .Then the necessary data was collected .The researcher or relative read the questions to the patient and marked exactly the answer they gave. Elderly patients who can read and write were given the questionnaire to complete. The researcher clarified the questions .The researcher then checked whether the questionnaires were complete, and asked the subjects to complete them as necessary.

The researcher managed to interview from 3 to 5 elderly patients daily. Time taken to fill study tools ranged from 20 – 25 minutes on individual basis to be filled depending on the degree of understanding and response of the patient. The researcher coded the questionnaires to assure the anonymity of the subjects. Finally, the researcher scored the responses, and compiled them for data analysis.

The data collection covered a period of 6 months, started from the beginning of November 2016 to the end of April 2017.

2.11 Statistical analysis;

Data were analyzed using the statistical package of social science "SPSS" software version 16.0. The qualitative data were presented as numbers, percentages. Chi square (X2) and Monte Carlo was used to test the association between two qualitative variables or to detect differences between two or more proportions. Graphs were done for data visualization using Microsoft excel. The quantitative data were presented as mean ± SD. The groups were compared using independent sample t test which compare the means of two independent groups to determine whether there is statistical evidence that the associated population means are significantly different, and one way analysis of variance (ANOVA) f test which used for testing the difference between more than two groups mean. Pearson's correlation coefficient (r) used to evaluate the correlation between variables. The difference was considered significant at $p \leq 0.05$.

IV. Results

Table (1) shows that females were more prevalent in the study sample than males, they constituted (56.5%) of the elderly patients, while only (43.5%) were males. The mean age of the studied elders was 64.66±4.83 years. Most of studied elders (72.2%) were married. Most of studied elders (70.4%) had primary education, while (15.8%) had university education and above. Concerning working before retirement, above half of the studied elders (52.8%) was working. Regarding the living condition, mostly of the studied elders (88.0 %)

were living with family, while (12.0%) were living alone. Only, (46.3%) of the studied elders had a fixed income.

Table 1: the distribution of elderly patients undergoing PCI according to their socio-demographic characteristics

Socio demographic data	No (108)	Percent (%)
Gender :		
▪ Male	47	43.5
▪ Female	61	56.5
Age group:		
▪ 60< 75	94	87.0
▪ 75< 85	12	11.1
▪ ≥85	2	1.9
Marital status :		
▪ Married	78	72.2
▪ Widow& single	30	27.8
Educational level :		
▪ Primary education	76	70.4
▪ Secondary education	15	13.9
▪ University education & above	17	15.8
Working before retirement:		
▪ Working	57	52.8
▪ Not working	51	47.2
Living condition:		
▪ With family	95	88.0
▪ Alone	13	12.0
Source of income:		
▪ Not fixed	58	53.7
▪ Fixed	50	46.3

Table (2) demonstrates that, The majority of the studied elders (98.1%) had pain attack. It was found that the entire studied elders (100.0%) received antianginal and anticoagulant agents. In relation to hospitalization, mostly of the studied elders (88.0%) were previously hospitalized. It was also observed from the table that (72.2%) of the studied elders had hypertension. More than three quarters of the studied elders (75.9%) performed a diagnostic catheterization, while only (10.2%) performed previous PCI and open heart surgery. As regards to family history, about one third of the studied elders (37.0%) had positive family history for CAD and the majority of them (97.5%) with a first degree relation.

Table 2: Distribution of elderly patients undergoing PCI according to their medical history (No= 108)

Medical history		No (108)	Percent (%)
Pain attack :			
▪	Yes	106	98.1
▪	No	2	1.9
Medication #:			
▪	Antianginal drugs	108	100.0
▪	Anticoagulant	108	100.0
▪	Antiplatlet	106	98.1
▪	Drug to control cholesterol	35	32.4
Hospitalization:			
▪	Yes	95	88.0
▪	No	13	12.0

Associated diseases #:		
▪ Hypertension	78	72.2
▪ Diabetes mellitus	61	56.5
▪ Psychiatric stress	44	40.7
▪ High cholesterol	34	31.5
▪ Renal disease	4	3.7
▪ Obesity& rheumatic heart disease	4	3.7
History of interventions #:		
▪ Diagnostic catheter	82	75.9
▪ Any other surgery	40	37.0
▪ PCI& open heart surgery	11	10.2
Family history of CAD :		
▪ No	68	63.0
▪ Yes	40	37.0
Degree of relative:	(n=40)	(37.03)
▪ First degree	39	97.5
▪ Second degree	1	2.5

More than one answer.

Table (3) This table shows that the majority of the studied elders (92.6%) decreased coffee intake, and only (6.5%) reported that they neglected breakfast. Regarding the smoking behavior, it was found that (3.7%) of the studied elders were still smokers, while above quarter of them (27.8%) were ex-smokers and about two third (68.5%) never smoked. The majority of the studied elders who are smokers or ex-smokers (91.2%) smoked cigarettes. Concerning physical exercises, (60.2%) of the studied elders didn't perform any type of exercises. About half of the studied elders who didn't perform exercises (52.3%) were not able to perform exercises. Walking is the most frequently practiced exercises by them it was found that majority of the studied elders (95.3%) were practicing walking.

Table 3: Frequency distribution of elderly patients undergoing PCI according to their life style history (nutritional& activity habits)

Life style history		No (108)	Percent (%)
Food#:			
▪ Decreas e caffeine intake		100	92.6
▪ White meat		89	82.4
▪ Roasted food		89	82.4
▪ Add salts		73	67.5
▪ Fruits and vegetables daily		65	60.2
▪ Fat free milk		56	51.9
▪ Eat salted food		36	33.3
▪ Neglect breakfast		7	6.5
Smoking :			
▪ Non smoker		74	68.5
▪ Ex-smoker		30	27.8
▪ Smoker		4	3.7
Type of smoking :		(n=34)	(31.5)
▪ Cigarett e		31	91.2
▪ Shesha		3	8.8

physical exercises:			
▪	No	65	60.2
▪	Yes	43	39.8
Type of exercise:			
▪	Walking	41	95.3
▪	Cycling	2	4.7
Causes of not performing exercise:		(n=65)	(60.1)
▪	Not able		
▪	Laziness	34	52.3
▪	Doctors	27	41.5
advice & anxiety		4	6.1

More than one answer.

Table (4) Regarding general knowledge of CAD learning needs, more than three fourth of the studied elders (77.8%) reported that the most important learning needs was the self-rescue on heart attack, while (38.9%) of them reported that the treatment of CAD was not important. Concerning pre-procedural learning needs, more than half of the studied elders (56.5%, 56.5%) respectively reported that matters needing attention and procedure cost learning needs was the most important one, while (36.1%) of them reported that pre-procedural visit by nurses item was not important.

Table 4: Distribution of elderly patients undergoing PCI according to their general knowledge of CAD and pre-procedural learning needs (N = 108).

Domains	1.Not important		2.Slightly important		3.Moderately important		4.Extremely important	
	No	%	No	%	No	%	No	%
General knowledge of CAD								
Etiology of CAD.	39	36.1	28	25.9	26	24.1	15	13.9
Risks/predisposing factors of CAD	39	36.1	27	25.0	24	22.2	18	16.7
Symptoms of heart attack.	18	16.7	27	25.0	33	30.6	30	27.8
Self-rescue on heart attack.	3	2.8	3	2.8	18	16.7	84	77.8
Diet of CAD patients	41	38.0	28	25.9	10	9.3	29	26.9
Physical activity of CAD patients	39	36.1	25	23.1	9	8.3	35	32.4
Treatment of CAD.	42	38.9	21	19.4	22	2.04	23	21.3
Pre-procedural								
Objectives of PCI	22	20.4	26	24.0	41	38.0	19	17.6
Operating procedure of PCI	23	21.3	32	29.6	36	33.3	17	15.7
Pre-procedural diet	19	17.6	28	25.9	22	20.4	39	36.1
Matters needing attention	3	2.8	14	13.0	30	27.8	61	56.5
How to cooperate during procedure	3	2.8	16	14.8	30	27.8	59	54.6
Pre-procedural visit by nurses	39	36.1	44	40.7	16	14.8	9	8.3
Complications and prognosis	28	25.9	16	14.8	15	13.9	49	45.4
Procedure cost	28	25.9	12	11.1	7	6.5	61	56.5
Mental adjustment	34	31.5	22	20.4	31	28.7	21	19.4

Table (5) As regards to post procedural learning needs, nearly all the entire studied elders (96.3%) reported that post-procedural position and activity learning needs was the most important one, while only (0.9%) reported that efficiency of PCI item was not important. In relation to post discharge learning needs, (91.7%) of the studied elders reported that discharge medication guide learning needs was the most important one, while only (0.9%, 0.9%) respectively reported that clinic follow-up and self-care guide items were not important.

Table 5: Distribution of elderly patients undergoing PCI according to their post-procedural and post discharge learning needs (N = 108).

Domains	1.Not important		2.Slightly important		3.Moderately important		4.Extremely important	
	No	%	No	%	No	%	No	%
Post-procedural								
Efficiency of PCI	1	0.9	0	0.0	34	31.5	73	67.6
Post-procedural position and	0	0.0	0	0.0	4	3.7	104	96.3
Post-procedural diet guide	0	0.0	0	0.0	15	13.9	93	86.1
Matters needing attention	0	0.0	0	0.0	14	31.0	94	87.0
Post-procedural medication guide	0	0.0	0	0.0	12	11.1	96	88.9
Post discharge								
Clinic follow-up	1	0.9	0	0.0	27	25.0	80	74.1
Discharge medication guide	0	0.0	0	0.0	9	8.3	99	91.7
Self-care guide (as quitting smoking, and eating low sodium,	1	0.9	0	0.0	9	8.3	98	90.7

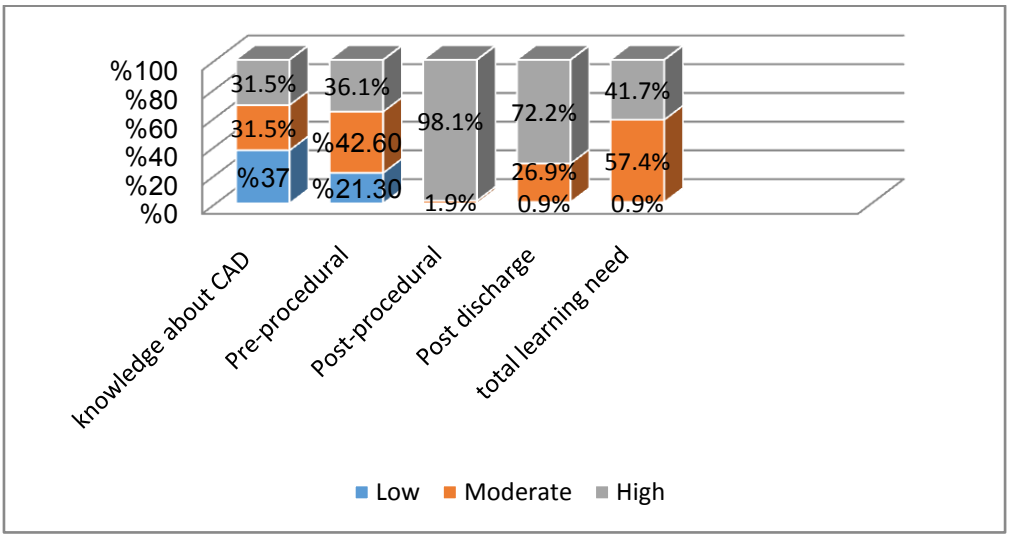

Figure (1): Distribution of elderly patients undergoing PCI according to total learning needs level for different studied domains (n=108).

Figure (1): show that elders' patients' learning needs in all investigated domains were high except the general knowledge about CAD and pre-procedural domains. The highest learning needs was that of post procedural and post discharge domains with score (98.1% and 72.2%) respect-tively. Considering learning needs according to their importance, post procedural and post discharge learning needs are the most important one. More than one half of the studied elders (57.4%) had moderate level of learning needs, (41.7%) had high level and only (0.9%) had low level.

Table (6): It was found that the most important items rated by the studied elders were post-procedural position and activity, discharge medication guide, self-care guide (96.3%, 91.7% and 90.7%) respectively. The items mentioned the least important by the studied elders were efficiency of PCI, matters needing attention before PCI and procedure cost (67.6, 56.5%, 56.5%) respectively.

Table (6): Ten most important learning needs ranked by all the studied elderly patients undergoing PCI.

Need to know	No	Percent (%)
Post-procedural position and activity	104	96.3
Discharge medication guide	99	91.7
Self-care guide	98	90.7

Post-procedural medication guide	96	88.9
Matters needing attention after PCI	94	87.0
Post-procedural diet guide	86.1	86.1
Self-rescue on heart attack.	84	77.8
Clinic follow-up	80	74.1
Efficiency of PCI	73	67.6
Matters needing attention before PCI and procedure cost	61	56.5

Table (7): shows that there was a statistical significance difference between gender and learning needs score (t= 2.920, P= 0.004).
Regarding age group, there was no statistical significance difference between age and learning needs score (F= 1.756, P= 0.178).
In relation to marital status, there was no statistical significance difference between marital status and learning needs score (t= 1.693, P= 0.093).
Concerning educational level, there was a statistical significance difference between educational level and learning needs score (F= 8.902, P= 0.000).
Moreover, the table shows that working before retirement, there was a statistical significance difference between working before retirement and learning needs score (t= 3.867, P= 0.000).
As regard living condition, there was no statistical significance difference between living condition and learning needs score (t= 1.392, P= 0.167).
Concerning source of income, there was a statistical significance difference between source of income and learning needs score (t= 2.197, P= 0.030).

Table (7): Relationship between learning needs score and sociodemographic characteristics of studied elders undergoing PCI (n=108).

Sociodemographic characteristics	No	Learning needs score Mean±SD	Significance test
Gender :			
▪ Male	47	68.91 ± 9.77	t= 2.920
▪ Female	61	75.21 ± 12.03	P= 0.004*
Age group:			
▪ 60< 75	94	71.68 ±11.64	F=1.756
▪ 75< 85	12	77.58 ± 9.07	P= 0.178
▪ ≥85	2	79.00 ± 12.72	
Marital status :			
▪ Widow & Single	30	75.46 ± 11.97	t= 1.693
▪ Married	78	71.32 ± 11.16	P= 0.093
Educational level :			
▪ Basic education and less	76	75.75 ± 11.11	F= 8.902
▪ Secondary education	15	64.26 ± 8.66	P= 0.000*
▪ University education	14	63.78 ± 8.44	
▪ Post University education	3	71.00 ± 1.73	
Working before retirement:			
▪ Working	57	68.66 ± 9.86	t= 3.867
▪ Not working	51	76.72 ± 11.78	P= 0.000*
Living condition:			
▪ Alone	13	76.61 ± 11.30	t= 1.392
▪ With family	95	71.90 ± 11.46	P= 0.167
Source of income:			
▪ Fixed	50	69.90 ± 11.69	t= 2.197
▪ Not fixed	58	74.68 ± 10.94	P= 0.030*

* P < 0.05 (significant)

V. Discussion

Elective percutaneous coronary intervention was found to be an effective treatment modality in elderly patients with significant coronary artery stenosis [(12)]. In the present study females were more prevalent than males. This may be attributed to the fact that the influence of various risk factors is different between men and women; untoward effects of smoking of CAD are greater in women than men. Furthermore, the effect of the

menopause is important in women, with higher incidence of plaque erosion in young women versus greater incidence of plaque rupture in older women [13]. This finding agreed with a study conducted in Italy by **Vetrano etal.,** [14] who reported that women were more prevalent than males in elderly patients. This result is in discordance with **Puchades etal.,** [15] who emphasized that males were more prevalent than females in elderly patients.

Also in the present study, the mean age of the studied elders was 64.66 ± 4.83 years. The same finding was supported by a study done in The Netherlands by **Borren etal.,** [16] who revealed that the mean age was 65 ± 10 years in elderly patients. These results disagreed with a study conducted in Italy by **Vetrano etal.,** [14] who reported that the mean age was 83 ± 7 years in elderly patients with CAD. The results of the study support the idea that the life expectancy of people in developed countries is high as compared to the people of developing countries of the world, financial resources, health standard and facilities, and every day circumstances are all those factors which may cause the low or high expectancy of the developed and developing countries of the world [17].

In relation to the study subjects' marital status, the present study reveals that the majority of the studied elders were married. This may be due to the fact that the married persons were more liable to the sources of stress, such as the physical, psychological, or social conditions which is a risk factor for CAD. This comes in the same line with a study done in Brazil by **Neto etal.,** [18] who revealed that married elderly patient with CAD were more prevalent than single, divorced and widow.

With respect to the educational level, the present study illustrate that about three quarters of the studied elders had basic education and less. This may be attributed to the fact that the elderly in the past had fewer opportunities to education; another explanation is that the majority of the studied elders were females who had lower opportunities for education than males. This results in the same line with a study done in Iran by **Mirzaie etal.,** [19] who reported that more than two thirds of the studied patients with CAD had lower than high school education.

The present study reveals that more than half of the studied elders worked before retirement. This may be attributed the fact that stress is a risk factor of CAD and work associated with daily physical and psychological stressors. This result disagreed with a study done in Iran by **Mirzaie etal.,** [19] who found that two thirds of the studied patients with CAD weren't employed. In relation to medical history, coronary artery disease is associated with a variety of cardiovascular and non cardiovascular conditions. In the present study about three quarters of the studied elders mentioned hypertension followed by diabetes mellitus, psychiatric stress and high cholesterol level. This finding may be explained by the fact that chronic diseases, co-morbidities and stress increase with advancing age. These results agreed with **Veeranna etal.,** [20] who reported that the most concomitant conditions in elderly patients were hypertension, diabetes mellitus, obesity and hyperlipidemia.

The current study revealed that nearly all studied elders had typical pain attack. This may be attributed to the fact that the prevalence of atypical manifestation increased steeply with age by up to forty seven percent in the group aged 75–79 years [21], while the minority of the present study was studied elders more than 75 years. This is in line with **Hung etal.,** [22] and disagree with a study done in Scotland by **Newby etal.,** [23] who found that more than one fifth of the studied patient had atypical chest pain.

As regards to previous interventions, the present study showed that more than three quarters of the studied elders were previously performed diagnostic cardiac catheterization, which agreed with **Khatri etal.,** [24]. Also in the present study, the minority of the studied elders performed previous PCI and CABG. These findings were in the same line with a study conducted in Italy by **Basta etal.,** [25] who mentioned that the minority of the elderly patients with MI performed previous PCI and CABG. These findings were in contrast with a study done in Scotland by **Johnman etal.,** [26] who mentioned that more than half of elderly patient performed previous PCI and CABG.This study showed that about two fifth of the studied elders had a family history for CAD which comes in agreement with **Basta etal.,** [25] who emphasized that about one third of CAD elderly patients had a positive family history for CAD. This is inconsistent with a study performed in Iran by **Dabiran, Manesh &Khajehnasiri.,**[27] who revealed that the minority of the studied elders had a positive family history for CAD.

In the present study, the result reveals that more than one quarter of studied elders had a history of smoking and the minority was still smokers. This finding could be attributed to physician's recommendations to stop smoking, also smoking declined steadily with rising age [28]. The result is congruent with **Goel etal.,** [29] who emphasized that the minority of the studied elders were smokers, and disagree with a study performed in Korea by **Won etal.,** [12] who found that one fifth of the studied elders were still smokers.

The current study illustrates that more than three fifth of the studied elders didn't perform any type of exercise. This is in line with a study done in Mansoura by **Borham, El-atrouny& El-hoda.,** [30] who revealed that more than one half of elderly patients with CAD were physically inactive, and disagree with **Young and Barnason.,** [31] who emphasized that the majority of the studied elders were physically inactive. This is explained by the fact that elderly patients and their families believe that when becoming elder, this is the time for rest not activity.

This study revealed that almost all elderly patients were interested to know the various aspects of their condition but their level of interest in learning the needs was different. Regarding general knowledge of CAD learning needs, our study revealed that the studied elders expressed higher concern in relation to self-rescue on heart attack, and showed less interest for treatment and diet of CAD. This come in line with **Kim etal., and You etal.,** [32,10] who stated that the patients showed high concern in relation to self-rescue on heart attack, also a study done in Trivandrum by **Dhanya.,** [33] who found that patients rated the diet category at last. This disagrees with **Eshah.,** [34] who stated that patients expressed higher concern in relation to treatment of CAD. The present study revealed that more than half of the studied elders were highly concerned about procedure cost. This doesn't agree with a study done in china by **You etal.,** [10] who found that patients showed less interest in procedural cost. This may be attributed the socio-economic difference between the two countries. Also in the present study, studied elders expressed less concern in relation to pre-procedural visit by nurses. This can be attributed to that they thought that the nurse didn't provide them with any information about the procedure. This disagrees with a study done in Ireland by **Kilonzo and O'Connell.,** [35] who found that the patients put a high concern on the nurse–patient relationship and the time needed for this.

Regarding post-procedural learning needs, the present study showed that the studied elders expressed more interest in relation to post-procedural position and activity, post-procedural diet guide, matters needing attention and post-procedural medication guide. This comes in line with a study done in Amman by **Subeh& Salami and Saleh.,** [36] who found that patients showed high interest in relation to complication information, psychological factors, medication, diet information, risk factors and physical activity. In relation to post discharge learning needs, this study revealed that studied elders more concerned about discharge medication guide and self-care guide. This comes in line with **Kilonzo and O'Connell.,**[35] who found that medic-ation, risk factors, diet and physical activity were the categories that patients found most important. Also, the total learning needs score for studied elders in all investigated learning needs domains were high except general knowledge about CAD disease and pre-procedural domains score were moderate which agrees with **Subeh& Salami and Saleh., and Sultana& Petpichetchian and Kritpracha.,** [36, 8] who found that the total learning need score for patients was high.

The present study results suggest that there are individual differences in elderly patients' desires for information. In this aspect several factors influence the learning needs of the studied elders undergoing PCI. These factors are gender, educational level, working before retirement and source of income. As regard gender, there was a statistical significance difference in learning need score between male and female. The total learning score in females was significantly higher than males. This may be explained by the fact that women tend to be attractive to their health more than males. This result supports the result of a study conducted in Bangladesh by **Sultana& Petp-ichetchian and Kritpracha.,**[8] who found that female patients reporting higher level of information needs than males. This result disagrees with **Şendir, Büyükyılmaz& Muşovi.,** [37] who found that gender did not affect the learning need scores.

Concerning age of the studied elders and learning need, no statistically significance association was found between age of the studied elders and learning need level. This result supports the result of **Özdemir& Yildiz and Akansel,** [38] who stated that his results failed to show any relationship between patients' age and their learning needs, but inconsistent with the result of a study done in Jordan by **Eshah.,** [34] who showed a significant relationship between a patient's age and perceived learning needs. This can be attributed to that this study was included younger and older patients but the present study were performed on older patients only.

As regard marital status, the result of this study revealed no statistical signify-cance difference between marital status and total learning need score. This result is in agreement with a study done in Istanbul by **Temiz etal.,** [39] who found that patients' marital status had no effect on their learning needs. The study showed that elderly patients' educational level had a significant relation with their learning need. Elderly patients with average or high education had less learning need than those who are just read and write. This result is incongruent with that of **Fredericks.,** [40] whose study revealed that there was no significant relationship between the level of education and the learning needs.

Moreover, regarding working before retirement the result of this study revealed that elderly patients who were employee reported lower learning need scores and the difference was statistically significant. In the same line **Demirkiran and Uzun.,** [41] who found that learning needs were higher in housewives but lower in officers. In contrast another study conducted by **Ozel etal.,** [42] who found no significant association between occupation and learning needs.The present study findings showed significant statistical relation between income and learning need. Elderly patients with fixed income had lower learning needs than those with not fixed income. This result agrees with **Eshah., and Sultana& Petpichetchian and Kritpracha.,** [33, 8] who found signifi-cant association between income and learning needs.

VI. Conclusion

Findings of this study revealed that nearly all studied PCI elderly patients require learning needs at high level in all investigated domains except general knowledge about CAD and pre-procedural learning needs domains were at moderate level. Also, elderly patients' learning needs can be affected by their sociodemographic characteristics like gender, level of education, working before retirement and income. Assessment of learning needs of elderly patients undergoing PCI is therefore important and provides guidance for health care system in planning the education program and helps to improve the clinical outcome and reduce the cost of care.

VII. Recommendation

In the light of the findings of the current study, the following recommendations are suggested:

1. Designing educational program for elderly patients undergoing PCI that should based on their learning needs.
2. Discharge process should be individualized for each elderly patient according to their indivi-dual characteristics.

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