Learning Needs and Its Associated Factors among Elderly Patients Undergoing Coronary Angiography and Percutaneous Coronary Intervention

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**ABSTRACT**

Coronary Angiography and Percutaneous Coronary Intervention consider cornerstone for diagnosis and treatment of CAD today. The previous studies that evaluated cardiac patients learning needs didn't shed light on the unique needs of patients undergoing coronary angiography and percutaneous coronary intervention. The current study aimed to assess learning needs and its associated factors among elderly patients undergoing coronary angiography and percutaneous coronary intervention at Zagazig University Hospitals. Descriptive design was utilized to conduct this study. A purposive sample of 155 elderly patients undergoing Angiography and percutaneous coronary intervention at cardiac catheterization units in Zagazig University Hospitals a structured interview questionnaire consisted of three parts (demographic characteristics, health profile and habits of the studied elderly) and a modified Cardiac Patient Learning Needs Scale. The present study revealed that 61.3% of studied elderly patients had high learning needs, 29.7% had moderate learning needs. High level learning needs were found in males, married, those with low educational level, those didn't receive instructions preoperatively and those didn't have a history of previous coronary intervention. The studied elderly patients’ learning needs were high in all domains. There were statistically significant relations between total learning needs and gender, marital status, educational status, receiving instructions previously, and previous cardiac catheterization. Continuously assessing the learning needs of patients undergoing coronary angiography and PCI. Develop a comprehensive health education program that is focused on these needs to enhance their knowledge and improve the outcome of their disease.

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**INTRODUCTION**

One of the most notable achievements is the increase in the life expectancy of the people, resulting in a substantial increase in the number of people aged 65 years and above, especially in low- and middle-income (Mehri et al., 2020). Globally the proportion of the elderly will increase from 12.3 per cent in 2015 to 16.5 per cent in 2030 and 21.5 per cent in 2050. Older people are predicted to account for one in five, worldwide by 2050 (Long and Sudnongbua, 2017).

Ageing is characterized by a steady decrease in physiological reserves of various organs, including the endocrine, cardiovascular, respiratory, gastrointestinal, and renal systems (Wakahara et al., 2018). One of the most known functional changes is ageing of the arteries, it is the loss of their elasticity, and the blood vessel walls are more rigid and thicker.
Table 1: Demographic characteristics of the studied elderly patients (N=155).

| Characteristics         | Frequency | Percent |
|-------------------------|-----------|---------|
| Age (year)              |           |         |
| 60-<65                  | 60        | 38.7    |
| 65-<70                  | 72        | 46.5    |
| ≥70                     | 23        | 14.8    |
| Mean ±SD 65.17±3.88     |           |         |
| Gender                  |           |         |
| Male                    | 97        | 62.6    |
| Female                  | 58        | 37.4    |
| Residence               |           |         |
| Rural                   | 85        | 54.8    |
| Urban                   | 70        | 45.2    |
| Marital status:         |           |         |
| Single                  | 3         | 1.9     |
| Married                 | 89        | 57.5    |
| Divorced                | 14        | 9       |
| Widowed                 | 49        | 31.6    |
| Educational level       |           |         |
| Illiterate              | 48        | 31      |
| Read & write            | 15        | 9.7     |
| Primary education       | 44        | 28.4    |
| Secondary education     | 37        | 23.9    |
| University / Postgrad-  | 11        | 7.1     |
| uate education          |           |         |
| Working before retirement |          |         |
| Government sector       | 40        | 25.8    |
| Employee                |           |         |
| Private sector          | 27        | 17.4    |
| Free business           | 13        | 8.4     |
| Farmer                  | 17        | 11      |
| House wife              | 58        | 37.4    |
| Current occupation      |           |         |
| Work                    | 14        | 9       |
| Not work                | 141       | 91      |
| Monthly income          |           |         |
| Sufficient              | 55        | 35.5    |
| Not sufficient          | 89        | 57.4    |
| Sufficient and save     | 11        | 7.1     |

as atherosclerosis and degeneration are very common findings (Fillit et al., 2016).

Coronary Artery Disease (CAD) occurs when the coronary arteries are compressed and narrowed due to accumulations on their inner wall, which consists of cholesterol deposits and other substances in the artery. This leads to narrowing of the arteries over time, which may partially or completely obstruct the blood flow leading to an ineffective supply of oxygen to the heart (Chopra, 2017).

CVD is responsible for one-third of deaths in developing and developed countries, reaching close to 50% of all deaths worldwide (Kandaswamy and Zuo, 2018). Likewise, the number of elderly patients with CVD has steadily increased. Patients aged more than 75 years account for more than one-third of those presenting with CVD and constitute more than 50% of in-hospital mortality due to it (Yilmaz et al., 2019). Egypt is the most populated nation in the Middle East and North Africa, with one of the highest cardiovascular death rates in the world, where the rate of CAD was 51% of total death. According to a
Table 2: Medical history, history of cardiac disease and family history of the studied elderly patients (N=155).

| Items                                                                 | Frequency | Percent |
|----------------------------------------------------------------------|-----------|---------|
| Having chronic diseases (n=155)                                      |           |         |
| Yes                                                                  | 128       | 82.6    |
| No                                                                    | 27        | 17.4    |
| Types of chronic diseases (n=128) (more than one response)           |           |         |
| High blood pressure                                                  | 92        | 71.9    |
| Diabetes                                                             | 45        | 35.2    |
| Heart disease                                                        | 36        | 28.1    |
| Arthritis                                                            | 4         | 3.1     |
| Chest Diseases                                                       | 8         | 6.3     |
| Kidney Diseases                                                      | 5         | 3.9     |
| Asthma                                                               | 6         | 4.7     |
| Neurological diseases                                                | 3         | 2.3     |
| Types of current medication                                          |           |         |
| Angina drugs                                                         | 152       | 98.1    |
| High cholesterol drugs                                               | 142       | 91.6    |
| Anti-coagulant drugs                                                 | 148       | 95.5    |
| Anti-hypertensive drugs                                              | 92        | 59.4    |
| Diabetes mellitus drugs                                              | 45        | 29      |
| Other drugs                                                          | 10        | 6.5     |
| Hospitalization previously for heart problems                       |           |         |
| Yes                                                                  | 117       | 75.5    |
| No                                                                    | 38        | 24.5    |
| Having Diagnostic Catheter before                                   |           |         |
| Yes                                                                  | 65        | 41.9    |
| No                                                                    | 90        | 58.1    |
| Having Therapeutic Catheter before                                   |           |         |
| Yes                                                                  | 24        | 15.5    |
| No                                                                    | 131       | 84.5    |
| N. of pervious cardiac catheterization (n=89)                        |           |         |
| Once                                                                 | 55        | 61.8    |
| Twice                                                                | 25        | 28.1    |
| Three and above                                                      | 9         | 10.1    |
| Having Open heart surgery before                                     |           |         |
| Yes                                                                  | 21        | 13.5    |
| No                                                                    | 134       | 86.5    |
| Having attack of chest pain                                          |           |         |
| Yes                                                                  | 134       | 86.5    |
| No                                                                    | 21        | 13.5    |
| Family history of heart diseases                                     |           |         |
| Yes                                                                  | 74        | 47.7    |
| No                                                                    | 81        | 52.3    |
Table 3: Relation between demographic characteristics of the studied elderly patients and their total learning needs (N=155).

| Items               | Total learning needs | P-Value |
|---------------------|----------------------|---------|
|                     | High (n=95)           | Moderate (n=46) | Low (n=14) |
|                     | %                    | %        | %           |
| Age (year)          |                      |         |             |
| 60-<65              | 31.6                 | 54.3     | 35.7        | 0.120       |
| 65-<70              | 57.9                 | 21.7     | 50          |             |
| ≥70                 | 10.5                 | 23.9     | 14.3        |             |
| Gender              |                      |         |             |
| Male                | 56.8                 | 63       | 100         | .008**      |
| Female              | 43.2                 | 37       | 0.0         |             |
| Residence           |                      |         |             |
| Rural               | 55.8                 | 39.1     | 100         | .000**      |
| Urban               | 44.2                 | 60.9     | 0.0         |             |
| Marital status      |                      |         |             |
| Single              | 3.2                  | 0.0      | 0.0         | .000**      |
| Married             | 62.1                 | 56.6     | 28.6        |             |
| Divorced            | 3.2                  | 2.1      | 71.4        |             |
| Widowed             | 31.5                 | 41.3     | 0.0         |             |
| Educational level   |                      |         |             |
| Illiterate          | 36.8                 | 28.3     | 0.0         | .000**      |
| Read & write        | 9.5                  | 13       | 0.0         |             |
| Primary             | 25                   | 34.8     | 28.6        |             |
| Secondary           | 28.4                 | 21.7     | 0.0         |             |
| Post Graduate       | 0.0                  | 2.1      | 71.4        |             |
| Current working     |                      |         |             |
| Work                | 3.2                  | 0.0      | 78.6        | .000**      |
| Not work            | 96.8                 | 100      | 21.4        |             |
| Monthly income      |                      |         |             |
| Sufficient          | 60                   | 60.9     | 28.6        | .000**      |
| Not sufficient       | 40                   | 37       | 0.0         |             |
| Sufficient & save   | 0.0                  | 2.1      | 71.4        |             |

*significant at p < 0.05. **highly significant at p < 0.01.

Figure 1: Total learning needs levels of the studied elderly patients undergoing Coronary Angiography and Percutaneous Coronary Intervention (N=155).

According to recent research, approximately 80 per cent of CAD patients are diagnosed with coronary angiography and 60–70 per cent of these benefits from the percutaneous coronary intervention (Saleh et al., 2016). Coronary angiography (CA) is generally recognized as a non-invasive technique and study conducted in Egypt by Reda et al. (2019) (Reda et al., 2019).
### Table 4: Relation between health history of the studied elderly patients and their total learning needs (N=155).

| Items                          | Total learning needs |          |         |          |          |         |
|-------------------------------|----------------------|----------|----------|----------|----------|----------|
|                               | High n=95            | Moderate n=46 | Low n=14 | P-Value  |          |          |
|                               | %                    | %        | %        |          |          |          |
| Having attack of chest pain   | Yes                  | 100      | 76.1     | 28.6     | .000**   |          |
|                               | No                   | 0.0      | 23.9     | 71.4     |          |          |
| Receiving instructions before | Yes                  | 4.2      | 19.6     | 100      | 0.01*    |          |
|                               | No                   | 95.8     | 80.4     | 0.0      |          |          |
| Having chronic diseases       | Yes                  | 83.2     | 84.8     | 71.4     | .500     |          |
|                               | No                   | 16.8     | 15.2     | 28.6     |          |          |
| Hospitalization previously for heart problems | Yes | 75.8  | 67.4 | 100 | 0.041* |          |
|                               | No                   | 24.2     | 32.6     | 0.0      |          |          |
| Previous Diagnostic Catheterization | Yes | 29.5  | 50  | 100 | .000** |          |
|                               | No                   | 70.5     | 50       | 0.0      |          |          |
| Previous Therapeutic Catheterization | Yes | 3.2   | 37       | 28.6     | .000**   |          |
|                               | No                   | 96.8     | 63       | 71.4     |          |          |
| Previous Open heart surgery   | Yes                  | 0.0      | 23.9     | 71.4     | .000**   |          |
|                               | No                   | 100      | 76.1     | 28.6     |          |          |
| Family history of heart disease | Yes | 47.4  | 41.3  | 71.6 | .142       |          |
|                               | No                   | 52.6     | 58.7     | 28.6     |          |          |

*significant at p < 0.05. **highly significant at p < 0.01.

### Table 5: Best fitting multiple linear regression models for the Learning needs of elderly patients undergoing coronary Angiography and PCI

| Items                          | Unstandardized Coefficients |          | standardized Coefficients |          |          |          |
|-------------------------------|-----------------------------|----------|---------------------------|----------|----------|----------|
|                               | B                           | Standard | Beta                      |          |          |          |
|                               | T                           |          |                           |          |          |          |
|                               | P. value                    |          |                           |          |          |          |
| Gender                        | .638                        | .321     | .048                      | 13.645   | .024*    |          |
| Educational level             | .856                        | .514     | .174                      | 19.114   | .001**   |          |
| Marital status                | .761                        | .118     | .145                      | 13.564   | .021*    |          |
| Having chest pain attack      | .378                        | .147     | .114                      | 2.546    | .067     |          |
| Receiving instructions before | .631                        | .015     | .054                      | 16.334   | .001**   |          |
| Having medical procedures before(cardiac catheterization-open heart surgery) | .945 | .321 | .057 | 19.556 | .000** |          |
| Family history of heart disease | .641                        | .413     | .098                      | 1.350    | .05      |          |
| Model summary                 | R                           | .857     | R square                  | .734     | Adjusted R square | Std. error of estimate |
| Regression                    | R square                    | .695     | Std. error of estimate    | .542     |          |          |

a. Dependent Variable: Learning needs
b. Predictors: (constant): gender, education, marital status, current medication...etc.
the gold standard for diagnosing CAD by identifying the location and extent of blood flow obstruction in coronary arteries (Xu et al., 2017). On the other hand, percutaneous coronary intervention (PCI) is the non-surgical treatment of coronary artery diseases by the aid of a balloon catheter, to open blocked coronary arteries, therefore improving the blood flow to the heart without the need for surgical intervention as open-heart surgery or CABG (Lima et al., 2019).

Discharge from hospital is a critical time for patients undergoing PCI because they need to adjust their lifestyle, incorporate new medication. After all, patients are susceptible to further cardiac events (Redfern and Briffa, 2014). On the other hand, a shortened hospital stay, the chances for healthcare providers to provide health details to patients undergoing PCI is reduced (Greco et al., 2016). Health education for patients with CAD is essential because knowledge about health and disease may help to keep individuals well, by encouraging them to adopt a healthy lifestyle. Also, it allows patients to understand the diagnosis and treatment options (Lim and Low, 2017). On the other hand, adequate patients' information and their engagement in treatment regimen will minimize re-hospitalizations and improve the outcome of their disease (Franzon et al., 2018).

Pre-operative education after identifying the patient needs by a gerontological nurse is essential for patients undergoing coronary intervention to enhance patients involvement by providing them detailed knowledge, coping skills, and pre-operative psychosocial support (Guo et al., 2014). Learning needs can be simply defined as the gap between the current level of experience and abilities and the required level of knowledge and abilities (Yu et al., 2016). Gerontological nurses must be aware of what details each patient should prioritize to help in obtaining the knowledge and skills required for coping with CAD and progressing through the acute stage of their diseases (Lucas et al., 2015). However, decrease in the length of stay following coronary angiography and percutaneous coronary intervention creates a new challenge for gerontological nurses and other health care providers in delivering appropriate interventions and effective health education programs that adequately address patient self-care management and coping with CAD (Alkubati et al., 2013).

Significance of the study

With advanced age, the risk for atherosclerosis increases, especially coronary arteries diseases which are considered one of the most common causes of mortality among older people. On the other hand, the World Health Organization report published in 2017 revealed that coronary artery disease deaths in Egypt reached 24.58% (Moneem et al., 2019). The number of elderly patients undergoing invasive methods for diagnosis and treatment of CAD also increased. As these methods are considered as one of the easiest, more straightforward methods, also do not expose patients to anaesthesia and its complications and characterized by discharge after procedure. Therefore, an insufficient opportunity for a nurse to give the patient important information about his health condition. So findings of this study would help to develop health education programs based on actual needs to patients’ undergoing coronary angiography and PCI.

Aim Of The Study

The current study aimed to assess learning needs and its associated factors among elderly patients undergoing coronary angiography and percutaneous coronary intervention at Zagazig University Hospitals.

Research questions

The current study aimed to answer the following research questions

1. What are the needs of elderly patients undergoing coronary angiography and percutaneous coronary intervention?

2. What are the factors affecting the needs of elderly patients undergoing coronary angiography and percutaneous coronary intervention?

Subjects And Method

Research design

A descriptive design was utilized to conduct the current study.

Study settings

The study was carried out in two settings. The initial setup was the Cardiac Catheterization Unit at Cardio-Thoracic building in Sednawy Hospital at Zagazig University Hospitals, and the second set was the Cardiac Catheterization Unit at an Internal Hospital at Zagazig University Hospitals.

Subjects

The subjects qualified for the present study included a purposive sample of 155 elderly patients who were admitted to Cardiac Catheterization Units for undergoing Coronary Angiography and Percutaneous Coronary Intervention (PCI), who were able to communicate and agreed to participate in the study. As well, elderly patients who weren't diagnosed with mental or psychological diseases.
Sample size

The sample size was calculated using open EPI. Version 6 Infosoftware. It was based on assuming that the total population of elderly patients undergoing Coronary Angiography and Percutaneous Coronary Intervention at Cardiac Catheterization Units in Zagazig University Hospitals were 265, based on hospital records and 41.7% of patients undergoing Coronary Angiography and PCI had high learning needs (Shahine et al., 2017); so that sample size was 155 with 80% power and at a 95% level of confidence.

Tools for data collection

The tools used to collect the required data were two tools as follows:

The tool I

A Structured Interview Questionnaire

Was developed by the authors to collect the necessary data. It consisted of three parts: demographic data, health profile, and habits of the patients explained as follows

Part 1

Demographic Characteristics of the Studied Elderly patients

Used to assess demographic characteristic of the studied elderly patients as (age, sex, residence, educational status, marital status, work before retirement, current occupation, and monthly income).

Part two

Health profile of the studied elderly patients

Part two developed by the author concerned with the medical history of the studied elderly patients and involved questions about present medical history (chest pain attack, current medication, instructions before undergoing a diagnostic or therapeutic cardiac catheterization, etc.) In addition to questions about past medical history (the type of chronic diseases, hospital admission, previously medical intervention) and questions regarding family history.

Part three

Habits of the studied elderly patients

This part was used to assess elderly habits which include questions about nutritional practices, smoking and physical activity of the patients.

Tool II

A modified Cardiac Patient Learning Needs Scale (MPLNS)

This tool was adapted from the Cardiac Patient Learning Needs Inventory (CPLNI) developed by Gerard (Gerard and Peterson, 1984) and modified by the author. A modified Cardiac Patient Learning Needs Scale composed of five domains. The first domain (general knowledge of coronary artery disease) comprised of eight items (1-8). The second domain (Psychological concern) consists of three elements (1-3). Third domain (Pre-procedural learning needs) comprised of eight items (1-8). Fourth domain (post-procedural learning needs) consist of seven items (1-7). Fifth domain (post-discharge learning needs) comprised of four items (1-4). The score of importance from 1 to 3 was used in each subject to reflect from the least to the most important with the response choice of not important (1), moderately important (2) and very important (3). The total learning needs score of 30 items with three likert scale responses from 1 to 3 Ranged between 30 to 90. This could be categorized in three levels as follows: 30 (low important), >30 ≤60 (moderately important), and >60-90 (high Important).

Preparatory phase

The author took adequate time to review the available relevant literature and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and magazines to establish data collection tools for better understanding the research problem and the techniques employed.

Content validity

The study tools were reviewed by three experts from the Faculty of Nursing (Community Health Nursing Department and Psychiatric Nursing Department) and the Faculty of Medicine (Community Medicine Department), at Zagazig University. The panel revised the tools content for relevance, clarity, comprehensiveness, and understandability.

Pilot study

A pilot study was carried out on 15 elderly patients who attended the Cardiac Catheterization Units represented 10% of the total study sample. The purposes of the pilot study were to test the feasibility, clarity and applicability of the study tools. Also, to appraise the necessary time for completion of the data collection tools. All participants received a transparent clarification for the study purpose. Since there were no modifications in the data collection tools after conducting the pilot study, subsequently, this pilot study was included in the studied sample.

Ethical Considerations

The study was approved by the research ethics committee (REC) of the Faculty of Nursing at Zagazig University in February 2019. The elderly patients
received a verbal description of the aim of the study, and non-participation or withdrawal rights at any time without giving any explanations. Also an informed consent for participation was taken verbally from each of the elderly patients after full explanation of the aim of the study. The elderly patients were informed that their participation in this study was voluntary. Also they assured about the confidentiality of the information gathered.

Field work

Once the approval was granted to progress in the study, the author started to organize a schedule for collecting the data. The author visited the Cardiac Catheterization Units to be familiar with work process, time of work, to observe elderly patients attended the unit to set schedule for data collection. The author used to go to the Cardiac Catheterization Units from eight o’clock before the official working times began where elderly patients went to the cardiac catheterization units early and author waited for interviewing the elderly patients who fulfilled the criteria. Until the unit nurses came to bring patients from waiting area to the patients’ room to change their clothes with hospital uniform then each patient sat on his bed until the nurse came to him and prepared him to cardiac catheterization. Each elderly patient was interviewed individually by the author who introduced herself and explained the purpose of the study briefly, and reassured them that information obtained was firmly confidential and would not be used for any purposes other than research. The study tool questions were answered by each patient privately. The time needed to fill out the questionnaire ranged from 30 to 40 minutes. Data were collected through four months from the end of May 2019 until the end of September 2019; three days per week (Saturday, Sunday and Wednesday) in Cardiac Catheterization Unit in Sednawy Hospital and one day (Monday ) in second Cardiac Catheterization Unit in Internal Hospital at Zagazig University Hospitals.

Administrative design

The administrative design was fulfilled through submission of a formal letter containing aim of study from post-graduate department at Faculty of Nursing Zagazig University to two Cardiac Catheterization Units directors, which in turn referred it to the manager of Zagazig University Hospitals for final approval. The author visited these two settings, met with the directors of the two units, explained to them the study aim and the importance of the study and its procedures, and asked for their cooperation.

Statistical design

The collected data were organized, tabulated and statistically analyzed using the Statistical Package for Social Sciences (SPSS) version 22. Data was presented using descriptive statistics in the form of frequencies and percentages. Chi-square test (X2) was used for comparisons between qualitative variables. Spearman rank correlation measures the strength and direction of association between two ranked variables. Cronbach alpha coefficient was calculated to assess the reliability of the scales through their internal consistency. In order to identify the independent predictors of the scores of Learning needs and SAI, the multiple linear regression analysis was used and analysis of variance for the full regression models was done. Statistical significant was considered at value<0.05.

RESULTS AND DISCUSSION

Table 1 displays that 46.5% of the studied elderly patients their age ranged between 65 to less than 70 years and the mean of age was 65.17±3.88 years. Also, 62.6% and 57.4% of the studied elderly patients were male and married, respectively. The same table also reveals that 54.8% of the studied elderly patients resided in rural areas and 91% of them weren’t working. In relation to the educational level of the studied elderly patients, Table 1 also shows that that 31% of them were illiterate and 28.4% of them had primary education, respectively. Moreover, only 7.1% had university education.

Table 2 reveals that 82.6% of the studied elderly patients suffered from chronic diseases and the highly reported diseases were high blood pressure (71.9%), diabetes (35.2%) and heart disease (28.1%). Regarding to history of cardiac diseases of the studied elderly patients, Table 2 also, reveals that 75.5% of the studied elderly patients admitted to hospital before because of heart problems. Concerning to previous cardiac intervention, Table 2 also, demonstrates that, 41.9% of elderly patients had a diagnostic cardiac catheterization and 15.5% of them had a therapeutic cardiac catheterization before, while only 13.5% of them had open heart surgery. Regarding to receiving instruction before, 17.4% of the studied elderly patients received instructions before performing a diagnostic or therapeutic cardiac catheterization and 44.3% of them received their instructions from a doctor or a nurse. In relation to family history of the studied elderly patients, 47.7% of them had positive family history of heart disease.

Referring to Percentage distribution of the studied elderly patients according to their total learning needs Figure 1 portrays that, 61.3% of the studied...
elderly had high score of total learning needs. Also, 29.7% of them had moderate score of total learning needs. While, only 9% of them had low score.

Referring to the distribution of the studied elderly patients undergoing coronary Angiography and PCI according to their total learning needs level for different studied domains, Figure 2 illustrates that the studied elderly patients learning needs were high in all domains. The highest learning needs were that of pre-procedural domain (64.5%) and post discharge domain (58.1%).

Table 3 represents that the studied elderly patient’s learning needs were highly statistically significant associated with elderly patients demographic characteristics (gender, residence, marital status, education level, current working and monthly income) at P < 0.01. It was clear that higher percentage of elderly patients with high learning needs were males, belonged to rural areas, married, Illiterate, weren’t working and had sufficient income Table 4 elucidates that there were highly statistically significant relations between total learning needs of the elderly and chest pain attack, previous diagnostic cardiac catheterization, previous therapeutic cardiac catheterization and previous open heart surgery at P < 0.01. Also, there were statistically significant relations with receiving instructions before and hospitalization previously for heart problems at P < 0.05. Table 5 expounds that gender, educational level, marital status, receiving instructions before and having medical procedure before were statistically significant positive predictors of patient’s learning needs levels.

Regarding total learning needs levels of the studied elderly patients undergoing Coronary Angiography and PCI, the present study findings showed that about two thirds of them had high learning needs and more than one quarter of them had moderate learning needs and less than one tenth of them had low learning needs.

Possible explanations of such result were; the immediacy of the procedure and short hospital stay for cardiac patients, especially those undergoing coronary angiography and PCI as six hours for patients undergoing coronary angiography and twenty four hours for patients undergoing PCI, resulted in their inability to obtain sufficient information and preparation for these procedure. Also demographic characteristics for study subjects as old age, lacked of adequate education for most of them, as well as living in rural areas as (one third of them were illiterate and more than half of them resided in rural areas) which made them less frequent seeker health centers and less contacted with health care provider to receive sufficient information about their condition.

This result was consistent with previous studies as the finding of an Egyptian study conducted in Mansoura city by Shahine et al. (Shahine et al., 2017), who evaluated the learning needs of elderly patients undergoing percutaneous coronary intervention and found that more than half of the studied elderly had moderate learning needs and almost half of them had high learning needs. As well, Egyptian study carried out by Mohammed et al. (Mohammed et al., 2016) revealed that patients undergoing coronary artery stent had no information about cardiac catheterization. Also, Sultana et al. (Sultana et al., 2015) conducted a study in Bangladesh and found that the patients’ needs across all eight domains were at a high level.

In the same context, Mosleh et al. (Mosleh et al., 2016) who carried out a study in Jordon and reported that all patients ranked all the learning needs topics as important or very important to them. Also with a study carried out in Oman by Almaskari et al. (Almaskari et al., 2019) who revealed that patients considered that all category of learning needs were of great importance to them. Additionally, Almamari et al. (Almamari et al., 2019) conducted a study in Oman and found that most patients had a high level of learning needs. Likewise, a study conducted by Auxilia (Auxilia, 2018) who found that nearly all patients undergoing CABG surgery had insufficient information. Likewise, a study conducted in Indonesia by Huriani (Huriani, 2019) who reported a high level average score for patient learning needs in the cardiac ward.

The current findings of the study showed that almost all elderly patients were interested in understanding the various aspects of their condition but their level of interest was various. Centered on their learning needs about general knowledge of CAD. About half of them needed knowledge about symptoms of heart attack and more than half of them interested to know treatment options of CAD. Also the current study found that nearly half of the study subjects interested to know self-rescue on heart attack.

This finding was consistent with previous study conducted in Iran by Heydari et al. (Heydari et al., 2015) who revealed that only 15 percent of the studied patients were well aware of their disease. Also a study conducted in Brazil by Galdeano et al. (Galdeano et al., 2010) who found that most patients had inadequate awareness of both their disease and its management. Similarly, Shahine et al. (Shahine et al., 2017) reported that the stud-
ied elderly patients undergoing PCI showed greater concern about self-rescue with heart attack. On the contrary, Hassankhani et al. (Hassankhani et al., 2020) in Iran, who reported that perceived medication, physical activity, and risk factors knowledge were the most critical learning needs for CAD patients.

With regard to psychological concerns among the elderly patients under the study, this study also showed that more than half of them needed information about normal psychological response to a heart attack and about three quarters of the studied elderly patients interested about what they should do to alleviate stress in their lives.

In the same vein, studies conducted by Almaskari et al. (Almaskari et al., 2019) in Oman, who found that psychological issue was one of the 10th highest priorities in learning needs for patients undergoing CABG, also reported that patients had a significant need to know what to do to minimize stress in their life. Also a study carried in Iran by Mohammadi et al. (Sayadi et al., 2019) who found that patients provided insufficient information about their psychological concern and needed to know ways to overcome stressful life situations.

According to learning needs pre-procedural the current study found that more than half of them were importantly needed to know precautions to be taken before coronary angiography or PCI and whether they experienced any pain during operation. Such findings were consistent with a study conducted in Malaysia by Ting et al. (Ting et al., 2013) revealed that patients reported that nurses did not deliver adequate details to pre-operatively fulfill their learning needs.

In Relation to Post-Procedural Learning Needs, the current study found that about two-thirds of the studied elderly patients expressed more concern about the possible risks and complications of cardiac catheterization, more than half of them were importantly needed information about contraindications to be prevented within 6 hours after procedure and about post-procedural diet guide.

In agreement with the present study findings, a study carried out in Jordan by Mosleh et al. (Mosleh et al., 2016) who reported that older participants expressed increased issues about risk factor management and postoperative complications, but less concerned about physical activity. Also Study conducted in Amman by Subeh et al. (Subeh et al., 2014) who revealed that patients were highly concerned with information on complications, psychological factors, medication, diet information, risk factors and physical activity. Likewise, a study carried out in Jordan by Ashour (Ashour, 2017) reported that PCI patients needed a lot of details, and immediate post-procedural information.

Concerning to post discharge learning needs, more than two-thirds of studied elderly patients were interested in knowing warning signs after procedure, approximately half of them needed information about self-care after discharge from hospital. The current study also revealed that about half of them were very interested to have information about wound care. This finding might due to most of them had anxiety and concerned about complication and outcome of the procedures. Also more than one third of them had diabetes and most diabetics’ patients had worries with wound care and they thought that their wound wouldn't heal quickly. The previous results were in the same line with Hansen and Sampognaro (Hansen and Sampognaro, 2019), in Malmo, who considered wound care, was the most significant self-perceived learning needs for patients after PCI. Also a study conducted in Turkey by Yilmaz (Yilmaz, 2017) showed that more than half of the patients did not receive discharge details after the operation. As well, a study carried out in Norway by Valaker et al. (Valaker et al., 2017) who assessed Continuity of care following percutaneous coronary intervention and reported that patients lacked knowledge about what to expect and how to access the health care system following discharge from hospital.

According priority of learning needs in relation highest learning needs of five learning needs domains in the study, the pre-procedural domain was graded as the first domain followed by the post-discharge domain as the second domain and the post-discharge domain as the third domain, while least but still high in the level of importance was psychological concern for elderly patient undergoing coronary angiography and PCI.

This finding conflicted with a study conducted by Mosleh et al. (Mosleh et al., 2016) who reported that the top priority learning needs for patients undergoing percutaneous coronary intervention and heart surgery were wound care followed by medications while physical activity was the lowest priority learning need topic. As well, Mosleh et al. (Mosleh et al., 2017) in Amman-Jordan revealed that wound care, post-intervention complications, risk factor management and diet ranked as the top priority subscales.

Also the study findings disagreed with Hansen and Sampognaro (Hansen and Sampognaro, 2019) who found that wound care, medication information, complications and symptoms of CAD were the most
important categories and the least important category was physical activity. Additionally, Sultana et al. (Sultana et al., 2015) found that medication was the most significant discharge information needs, followed by symptom treatment and diet.

The current study found that there were several factors influenced the learning needs of the studied elderly patients undergoing coronary angiography and PCI. These factors were gender, marital status, education level, current working, monthly income, received instructions previously and previous coronary intervention.

In terms of gender and current work, the current study found that there were statistical significant relations between both and total modified patient learning needs scale (MPLNS) score. As in males the total learning score was significantly higher than in females. Also, in non-worked patients the total learning score was also significantly higher than in worked patients. These findings were further verified by multiple linear regression models in which gender and working status were statistically significant positive predictors of elderly patient’s learning needs levels.

The previous results were in the same context with a study conducted by Mosleh et al. (Mosleh et al., 2016) who found that there were statistically significant relations between male gender and current job status and total patients learning needs scale (PLNS) score. Additionally, Alkubati et al. (Alkubati et al., 2013) in Yemen, who stated that more information needs, were indicated by worked patients. On the contrary, a study conducted by Sultana et al. (Sultana et al., 2015) stated that the average learning score in females was significantly higher than in males. Also, a study carried out in Istanbul by Temiz et al. (Temiz et al., 2016) who found that there was no significant relation between total PLNS scores and patient gender. As well, a study conducted by Ranjbar et al. (Ranjbar et al., 2018) in Iran, who found that there was no major difference between males and females under the study and patient total learning needs score.

With respect to marital status, the current study found that there was significant relation between the total learning needs level and marital status of the studied elderly patients; as married patients with high learning needs compared to unmarried patients. This was further confirmed by the findings that the marital status was significantly independent positive predictor of total patient learning needs level in multiple linear regression models. In the same context, a study conducted in Italy by Greco et al. (Greco et al., 2016) found that being married was significantly linked to the need for more knowledge.

In terms of monthly income, there was a significant relation between the level of learning needs and monthly income of patients. This result was further supported by multiple linear regression models, in which the income of patients was statistically significant positive predictor of the learning needs of the elderly patient. In agreement with this finding, a study carried out in Canada by de Melo Ghisi et al. (de Melo Ghisi et al., 2014) stated that patients with lower incomes had higher learning needs than those with higher incomes.

The current study finding also showed that there was significant relation between received pre-operative instructions and the total learning needs score of patients. This finding was further confirmed by multiple linear regression models in which received instructions before coronary interventions was statistically significant positive predictor of elderly patient’s learning needs levels. In accordance with this result, Mosleh et al. (Mosleh et al., 2016) found that patients who did not receive pre-instructions had a substantially higher total learning needs score than those who obtained instructions.

Moreover the current study finding showed that there was significant relation between having coronary interventions previously and the total learning needs score of patients. This finding was further confirmed by multiple linear regression models in which having coronary interventions previously was statistically significant positive predictor of elderly patient’s learning needs levels. As patients who hadn’t previous history of coronary interventions had high learning needs score. Likewise, a study conducted by Mosleh et al. (Mosleh et al., 2016) revealed that there was statistical significance difference between those with a history of previous coronary intervention, as patients with no history reported higher total learning needs level.

CONCLUSIONS

Findings of this study revealed that approximately two thirds of the studied elderly patients undergoing coronary angiography and PCI had high learning needs and more than one quarter of them had moderate learning needs. The studied elderly patients’ learning needs were high in all domains. There were several factors influenced the learning needs of the studied elderly patients as gender, marital status, education level, current working, monthly income, receiving instructions previously and previous coronary intervention.
Recommendations

Based on the results of this study, continuously assessing the learning needs of patients undergoing coronary angiography and PCI. Develop a comprehensive health education program that is focused on these needs to enhance their knowledge, reduce gaps, in order to adopt healthy behaviors after the operation and improve the outcome of their disease. Providing patients with brochures and videos containing basic and important instructions for CAD patients when leaving hospital.

Declaration Of Conflicting Interests

The authors declare that they have no conflict of interest for this study.

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