

HOSTED BY



Contents lists available at ScienceDirect

## International Journal of Nursing Sciences

journal homepage: <http://www.elsevier.com/journals/international-journal-of-nursing-sciences/2352-0132>

## Original Article

## Myocardial infarction patients' learning needs: Perceptions of patients, family members and nurses

Emil Huriani

Faculty of Nursing, Universitas Andalas, Limau Manis Campuss, Padang, West Sumatera, Indonesia

## ARTICLE INFO

## Article history:

Received 23 February 2018

Received in revised form

11 May 2019

Accepted 17 May 2019

Available online 21 May 2019

## Keywords:

Acute coronary syndrome

Health education

Learning

Needs assessment

## ABSTRACT

**Purpose:** This descriptive study aimed to identify and compare patient with myocardial infarction, their family member, and cardiac nurse perceptions on the learning needs of patients with myocardial infarction in the acute, sub-acute, and post-acute phases.

**Methods:** A total of 288 patients with myocardial infarction, 145 family members, and 40 cardiac unit nurses were enrolled in this study. Data were collected by survey method using the Cardiac Patient Learning Need Inventory (CPLNI). Data analysis was done using descriptive statistical analysis and analysis of variance.

**Results:** The results showed that the learning needs of patients with myocardial infarction were high according to the perceptions of patients, patients' family members, and nurses. There were differences in the priority of learning that the patient need in relation to the disease and healing process.

**Conclusion:** Patients, family members, and nurses have different perceptions regarding the learning needs of patients with myocardial infarction. To create adequate intervention to meet patient's learning needs, there should be an accurate assessment. The results of this study support the importance of patient-centered, individualized education and attention to learning priorities.

© 2019 Chinese Nursing Association. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## What is known?

- Learning needs and priority of information among patients after myocardial infarction changes over time.
- Patients and health care teams reported difference in perception of learning need/priority of information.

## What is new?

- We identified differences in perception of patients, family members and nurses on learning needs of patient after myocardial infarction.
- We identified changes on their perception on learning need over time.
- Our results suggest that an accurate assessment of learning need should be performed prior to health education.

## 1. Introduction

Cardiovascular disease is still the leading cause of death

worldwide. Cardiovascular disease accounted for 31% of all deaths worldwide in 2012. Cardiovascular disease is also the leading cause of death among noncommunicable diseases in people under 70 (37%), and 85% of these deaths occur in developing countries. This proportion is predicted to increase every year. Projections show that by 2030 cardiovascular disease will account for 22.2 million deaths. The World Health Organization targets a 25% reduction in mortality from noncommunicable diseases, one of which is cardiovascular disease [1].

In fact, although cardiovascular disease is the largest cause of death worldwide, the incidence of coronary heart disease in developing countries accounted for a considerable proportion, whereas mortality and morbidity from this disease decreased in developed countries [2]. But this did not happen evenly throughout the world. This phenomenon was related to the tendency of atherosclerosis incidence and patterns of nutrition and alcohol consumption habits [3,4]. In Indonesia, 37% of deaths were related to cardiovascular disease, and this figure was dominated by the 30–70-year age group [5].

The acute phase treatment program of myocardial infarction has progressed so the fatality rate after myocardial infarction decreased significantly since the 1990s, while the number of patients recovering from myocardial infarction increased. Nevertheless, among

E-mail addresses: [emilhuriani@gmail.com](mailto:emilhuriani@gmail.com), [emilhuriani@fk.unand.ac.id](mailto:emilhuriani@fk.unand.ac.id).

Peer review under responsibility of Chinese Nursing Association.

people who recover from the acute phase, myocardial infarction has morbidity and mortality rates 1.5–15 times higher than in the general population, depending on sex and clinical appearances. In addition, about 16% of men and 22% of women will experience heart failure. These individuals have a higher risk of subsequent myocardial infarction, sudden death, angina pectoris, heart failure, and stroke [6].

Patients with cardiovascular disease had low self-management capabilities and symptom and risk factors monitoring. In fact, these abilities are needed for early detection and treatment of worsening disease symptoms and reduce the risk of rehospitalization [7]. Such abilities should have been provided through health information session that should begin when the patient is admitted to the hospital. About half the patients have insufficient knowledge of self-care, self-care motivation, and self-care skills [8]. Providing health information should apply a patient-centered approach.

The patient's learning needs differ according to disease progression, changes over time, and is influenced by the patient's cultural and spiritual traditions. The main needs of hospitalized patients include learning and education [9]. There was a potential difference in the importance of health information for patients and health teams [10]. Learning needs and support after myocardial infarction were also associated with the patient's self-care level. Nevertheless, available data not enough to explain learning needs of patients throughout the disease process. Moreover, previous exploration of learning needs did not include family members as they are the closest social support of patients. Therefore, there is a need to explore and to compare learning need of myocardial infarction patient from perspectives of patient, family member and nurse.

Proper health education not only benefits patients' health behavior, but also benefits the financial burden. Health education in patients with heart disease can increase the percentage of visits to the clinic and reduce the incidence of rehospitalization, thereby reducing the financial burden of individuals and governments [11]. Furthermore, it is also necessary to have a health education strategy that can be implemented efficiently in the healthcare system.

Dr. M Djamil Hospital, Padang, Indonesia, has a Regional Heart Center of Central Sumatra, which became the referral center for heart health for West Sumatra, Riau, Jambi, and other surrounding provinces. The Heart Center has an acute cardiovascular care unit (CVCU), sub-acute care cardiac ward, a nonsurgical invasive heart intervention room, a cardiac polyclinic, and a diagnostic room. This Regional Heart Center has a higher level of cardiac care and cardiac interventions compared to surrounding heart care centers, particularly for nonsurgical invasive interventions and acute care.

Nurses have provided health education to patients and families, but the education has not been based on health education modules or health education guidelines, which are lacking. No records of health education have been provided so that health education provided at subsequent levels of care is not a continuation of previous health education.

The objectives of this study were to identify and to compare the perceptions of patients with myocardial infarction, their family members, and cardiac nurses about the learning needs of patients with myocardial infarction in the acute, sub-acute, and post-acute phases. The results of this study are expected to be a reference in the preparation of education standards and methods of health education in patients with myocardial infarction.

## 2. Methods

### 2.1. Study design

We explored the perceptions of patients with myocardial infarction, their family members, and cardiac nurses about the

learning needs of patients with myocardial infarction in the acute, sub-acute, and post-acute phases and assess the difference between them. We also explored the priority of learning needed by patients across the three phases of care. The study design was comparative study.

### 2.2. Setting and sample

The study was conducted at the CVCU, cardiac ward, and cardiac polyclinic of Dr. M Djamil Hospital, Padang, Indonesia during August to October 2017. Respondents consisted of patients, patients' family members, and nurses. Patients were post-myocardial infarction, had vital signs within normal range, and with no cognitive impairments. The three groups of patient respondents were: patients being admitted to the CVCU, patients admitted to cardiac ward, and patients who visited the polyclinic. There were therefore three corresponding groups of patient families. The family members were met while accompanying the patient to the hospital. Nurse respondents consisted of two groups, they are who work at the CVCU and cardiac ward.

### 2.3. Ethical consideration

Ethical approval was provided by Medical Research Ethics Committee of Faculty of Medicine Universitas Andalas (reference: 303/KEP/FK/2017). For protection of human subjects, patients, family members, and nurses were given an explanation of the study. Respondents who agreed to participate in this study were asked to sign written informed consent.

### 2.4. Instruments

Learning needs after acute myocardial infarction were assessed using the Cardiac Patient Learning Need Inventory (CPLNI), adopted from Gerard and Peterson [12]. The original tool consisted of 43 items categorized into 8 domains, namely introductions to the cardiac care unit, anatomy and physiology of the heart, psychological factors, risk factors, medication information, nutrition information, physical activity, and miscellaneous. Respondents were asked to rank answers on 5 categories, ranging from "not important" to "very important." For questionnaires for patient family members and nurses, the statement in each item was modified so that it could be used to ask the family member or nurse's perception of the patient's learning needs. Professional translators and expert validators translated the questionnaires, as it also ensure for content validity. Original version of the CPLNI had adequate internal consistency, as Cronbach's  $\alpha$  coefficient equal to 0.91 [12].

Other information collected from patients included age, sex, marital status, and education. Other information collected from the family member included age, gender, and education. Other information collected from nurses included age, sex, length of employment, length of work in the unit, and education.

### 2.5. Procedures

Initially, we identified patients with Acute Myocardial Infarction (AMI) treated in the CVCU or cardiac ward and who visited the cardiac polyclinic at Dr. M. Djamil Hospital and their families, as well as nurses assigned to both locations. Then a questionnaire was distributed to the respondents. After the questionnaire was completed, the questionnaire was collected.

### 2.6. Data analysis

Data were analyzed using descriptive statistical analysis to

describe the distribution of each variables. Furthermore, the data were analyzed using analysis of variance (ANOVA) to assess variations between respondent groups, with Games-Howell *post-hoc* testing to assess the difference between the mean of two respondent groups, with a significance level of less than 0.05. The Games-Howell *post-hoc* Test was applied since it is a nonparametric approach to compare combinations of groups, it does not assume equal variance and sample size. The test of homogeneity of variance showed that equal variance not assume ( $P < 0.05$ ).

### 3. Results

The respondents consisted of eight groups, They were patients were in the CVCU ( $n = 42$ ), patients in the cardiac ward ( $n = 42$ ), patients in the cardiac polyclinics ( $n = 204$ ), family members of patients at the CVCU ( $n = 33$ ), family members of patients at the cardiac ward ( $n = 35$ ), family members of patients at the cardiac polyclinics ( $n = 77$ ), cardiac nurses work at the CVCU ( $n = 21$ ) and cardiac nurses work at the cardiac ward ( $n = 19$ ). Some of the patients from whom data were taken at the time they were treated at CVCU also became respondents during the time they were treated in the cardiac ward. None of the respondents from whom data were taken at the time of their inpatient period were also taken data during their visit to the cardiac polyclinic. The number of patients was not equal to the number of family members because not all patients were accompanied by a family member at the time of data collection. In this study, nurses in the cardiac polyclinic did not become respondents because there were only six nurses, which was not comparable with the number of respondents in the other groups.

#### 3.1. Characteristics of respondents

Characteristics of respondents are presented in three separate tables: patients, family members, and nurses. Generally, characteristics of patient respondents in the CVCU, cardiac ward, and cardiac polyclinic were most frequently in the 51–60-year age range, were male, were a couple/married, and high school was their higher level of education (Table 1). In the family member group of respondents in the CVCU, cardiac ward, and cardiac polyclinics, the

**Table 1**  
Distribution of patient demographics.

| Demographic characteristics | CVCU ( $n = 42$ ) |      | Cardiac ward ( $n = 42$ ) |      | Cardiac polyclinic ( $n = 204$ ) |      |
|-----------------------------|-------------------|------|---------------------------|------|----------------------------------|------|
|                             | frequence         | %    | frequence                 | %    | frequence                        | %    |
| Age groups                  |                   |      |                           |      |                                  |      |
| 21–30 years                 | 0                 | 0    | 1                         | 2.4  | 0                                | 0    |
| 31–40 years                 | 0                 | 0    | 1                         | 2.4  | 2                                | 1.0  |
| 41–50 years                 | 7                 | 16.7 | 12                        | 28.6 | 24                               | 11.8 |
| 51–60 years                 | 14                | 33.3 | 16                        | 38.1 | 88                               | 43.1 |
| 61–70 years                 | 15                | 35.7 | 8                         | 19.0 | 65                               | 31.9 |
| 71–80 years                 | 6                 | 14.3 | 4                         | 9.5  | 25                               | 12.3 |
| Gender                      |                   |      |                           |      |                                  |      |
| Male                        | 32                | 76.2 | 28                        | 66.7 | 169                              | 82.8 |
| Female                      | 10                | 23.8 | 14                        | 33.3 | 35                               | 17.2 |
| Marital status              |                   |      |                           |      |                                  |      |
| Have spouse                 | 37                | 88.1 | 37                        | 88.1 | 195                              | 95.6 |
| Do not have spouse          | 5                 | 11.9 | 5                         | 11.9 | 9                                | 4.4  |
| Educations                  |                   |      |                           |      |                                  |      |
| Never complete school       | 1                 | 2.4  | 0                         | 0    | 0                                | 0    |
| Primary school              | 10                | 23.8 | 8                         | 19.0 | 22                               | 10.8 |
| Junior high school          | 6                 | 14.3 | 5                         | 11.9 | 38                               | 18.6 |
| Senior high school          | 22                | 52.4 | 20                        | 47.6 | 88                               | 43.1 |
| Higher educations           | 3                 | 7.1  | 9                         | 21.4 | 56                               | 27.5 |

Note: CVCU = Cardiovascular care unit.

**Table 2**  
Distribution of Patient's family member demographics.

| Demographic characteristics | CVCU ( $n = 33$ ) |      | Cardiac ward ( $n = 35$ ) |      | Cardiac polyclinic ( $n = 77$ ) |      |
|-----------------------------|-------------------|------|---------------------------|------|---------------------------------|------|
|                             | frequence         | %    | frequence                 | %    | frequence                       | %    |
| Age groups                  |                   |      |                           |      |                                 |      |
| 11–20 years                 | 1                 | 3    | 3                         | 8.6  | 1                               | 1.3  |
| 21–30 years                 | 7                 | 21.2 | 8                         | 22.9 | 14                              | 18.2 |
| 31–40 years                 | 7                 | 21.2 | 6                         | 17.1 | 10                              | 13.0 |
| 41–50 years                 | 9                 | 27.3 | 12                        | 34.3 | 20                              | 26.0 |
| 51–60 years                 | 4                 | 12.1 | 4                         | 11.4 | 16                              | 20.8 |
| 61–70 years                 | 5                 | 15.2 | 2                         | 5.7  | 12                              | 15.6 |
| 71–80 years                 |                   |      |                           |      | 4                               | 5.2  |
| Gender                      |                   |      |                           |      |                                 |      |
| Male                        | 8                 | 24.2 | 12                        | 34.3 | 18                              | 23.4 |
| Female                      | 25                | 75.8 | 23                        | 65.7 | 59                              | 76.6 |
| Educations                  |                   |      |                           |      |                                 |      |
| Primary school              | 3                 | 9.1  | 2                         | 5.7  | 5                               | 6.5  |
| Junior high school          | 3                 | 9.1  | 5                         | 14.3 | 10                              | 13.0 |
| Senior high school          | 17                | 51.5 | 20                        | 57.1 | 45                              | 58.4 |
| Higher educations           | 10                | 30.3 | 8                         | 22.9 | 17                              | 22.1 |

Note: CVCU = Cardiovascular care unit.

**Table 3**  
Distribution of cardiac nurse demographics.

| Demographic characteristics     | CVCU ( $n = 21$ ) |      | Cardiac ward ( $n = 19$ ) |      |
|---------------------------------|-------------------|------|---------------------------|------|
|                                 | frequence         | %    | frequence                 | %    |
| Age groups                      |                   |      |                           |      |
| 21–30 years                     | 7                 | 33.3 | 5                         | 26.3 |
| 31–40 years                     | 10                | 47.6 | 7                         | 36.8 |
| 41–50 years                     | 3                 | 14.3 | 6                         | 31.6 |
| 51–60 years                     | 1                 | 4.8  | 1                         | 5.3  |
| Gender                          |                   |      |                           |      |
| Male                            | 2                 | 9.5  |                           |      |
| Female                          | 19                | 90.5 | 19                        | 100  |
| Working periods                 |                   |      |                           |      |
| ≤5 years                        | 4                 | 19.0 |                           |      |
| 6–10 years                      | 8                 | 38.1 | 8                         | 42.1 |
| >10 years                       | 9                 | 42.8 | 11                        | 57.9 |
| Working periods in current unit |                   |      |                           |      |
| ≤5 years                        | 10                | 47.6 | 9                         | 47.4 |
| >5 years                        | 11                | 52.4 | 10                        | 52.6 |
| Educations                      |                   |      |                           |      |
| Nursing diploma                 | 17                | 81.0 | 10                        | 52.6 |
| Bachelor/RN                     | 4                 | 19.0 | 9                         | 47.4 |

Note: CVCU = Cardiovascular care unit, RN = Registered Nurse.

dominant characteristics were 41–50-year age range, female sex, and high school was their higher level of education (Table 2). Finally, in the nurse respondents, most were in the 31–40-year age range, female, working for more than 10 years, working in the current unit for more than 5 years, and their highest level of education was a diploma level of nursing (Table 3) (see Table 2).

#### 3.2. Cardiac patient learning need

The average score of cardiac patient learning needs was highest in the group of patients in the cardiac ward (Table 4). The average score of each domain of learning needs indicated that the medication information domain had the highest average score for all three groups of patient respondents.

The highest average score of cardiac patient learning needs according to the perception of respondents of patients' family member groups was in the group of respondent of patient's family

**Table 4**

Mean scores and standard deviation of each domain and overall cardiac patient learning needs.

| Learning Need                | 1           | 2           | 3           | 4           | 5           | 6           | 7           | 8           | F     | P     |
|------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------|-------|
| Introduction to cardiac unit | 3.88 ± 0.56 | 4.02 ± 0.60 | —           | 3.99 ± 0.58 | 4.00 ± 0.60 | —           | 4.72 ± 0.34 | 4.64 ± 0.37 | 10.96 | 0.000 |
| Anatomy and physiology       | 4.01 ± 0.55 | 3.94 ± 0.52 | 3.79 ± 0.77 | 4.18 ± 0.37 | 4.09 ± 0.42 | 3.70 ± 0.84 | 4.07 ± 0.75 | 4.60 ± 0.46 | 5.87  | 0.000 |
| Psychological factors        | 3.92 ± 0.53 | 3.91 ± 0.37 | 3.78 ± 0.79 | 4.04 ± 0.47 | 3.96 ± 0.23 | 3.66 ± 0.87 | 4.15 ± 0.60 | 4.64 ± 0.37 | 5.97  | 0.000 |
| Lifestyle factors            | 4.10 ± 0.60 | 4.05 ± 0.41 | 3.75 ± 0.8  | 4.12 ± 0.49 | 4.05 ± 0.37 | 3.70 ± 0.87 | 4.41 ± 0.46 | 4.72 ± 0.45 | 8.99  | 0.000 |
| Medication information       | 4.37 ± 0.49 | 4.27 ± 0.43 | 4.16 ± 0.89 | 4.22 ± 0.57 | 4.15 ± 0.40 | 4.02 ± 0.90 | 4.61 ± 0.46 | 4.75 ± 0.36 | 3.95  | 0.002 |
| Dietary information          | 4.06 ± 0.40 | 4.09 ± 0.32 | 3.89 ± 0.86 | 4.09 ± 0.70 | 4.14 ± 0.34 | 3.88 ± 0.89 | 4.39 ± 0.38 | 4.64 ± 0.40 | 4.34  | 0.000 |
| Physical activity            | 3.75 ± 0.69 | 3.82 ± 0.68 | 3.43 ± 1.00 | 3.99 ± 0.78 | 3.90 ± 0.49 | 3.17 ± 1.14 | 4.40 ± 0.51 | 4.52 ± 0.37 | 10.70 | 0.000 |
| Symptom management           | 4.04 ± 0.65 | 4.05 ± 0.29 | 3.86 ± 0.74 | 4.25 ± 0.38 | 4.07 ± 0.23 | 3.74 ± 0.86 | 4.46 ± 0.60 | 4.72 ± 0.40 | 8.28  | 0.000 |
| Miscellaneous                | 4.07 ± 0.49 | 3.93 ± 0.64 | 3.35 ± 1.13 | 4.16 ± 0.42 | 4.13 ± 0.43 | 3.13 ± 1.32 | 4.08 ± 0.58 | 4.49 ± 0.45 | 12.68 | 0.000 |
| Overall                      | 4.01 ± 0.35 | 4.11 ± 0.23 | 3.87 ± 0.69 | 4.11 ± 0.34 | 4.05 ± 0.23 | 3.74 ± 0.82 | 4.39 ± 0.39 | 4.64 ± 0.32 | 8.00  | 0.000 |

Note: CVCU = Cardiovascular care unit, CPLNI = Cardiac Patients' Learning Needs Inventory. Respondent groups: (1) Patients in CVCU, (2) Patients in cardiac ward, (3) Patients in cardiac polyclinic, (4) Patients' family in CVCU, (5) Patients' family in cardiac ward, (6) Patients' family in cardiac polyclinic, (7) Nurses in CVCU, and (8) Nurses in cardiac ward.

member in the CVCU (Table 4). The highest mean score on each domain of cardiac patient learning needs according to family members in the CVCU was symptom management whereas the medication information domain had the highest score on the family members in the cardiac ward and in the cardiac polyclinic groups.

The average score of cardiac patient learning needs according to the nurses was higher in nurses in the cardiac ward than in the nurses in the CVCU (Table 4). The average score on each domain of learning needs indicated that the domain introduction to the cardiac care unit had the highest average score for the group of nurse respondents in the CVCU, while in the cardiac ward, the highest average score was medication information.

### 3.3. Differences in cardiac patients learning needs

Of all the groups of respondents, the highest average score of the cardiac patient learning need was in the group of nurse respondents in the cardiac ward, while the lowest average score was in the family member group of respondents in the cardiac polyclinic. The results of analysis of variance test against the average score of learning needs of cardiac patients obtained was  $P < 0.001$  ( $F = 8.00$ ,  $P = 0.000$ ) (Table 4), meaning there was a meaningful difference of mean score learning needs of cardiac patients among all groups of respondents. The *post-hoc* test results for multiple comparisons, as shown in Table 5, indicated that there were significant differences in perception toward learning need of myocardial infarction patient. Perception of the cardiac ward nurse mostly differ from perception of other respondent groups ( $P < 0.05$ ).

## 4. Discussion

### 4.1. Cardiac patient learning needs according to patient perception

The three groups of patient respondents showed similarities in

the domain of learning required, which were introductions to the cardiac care unit (especially for hospitalized patients), anatomy and physiology of the heart, psychological factors, lifestyle factors, medication information, dietary information, physical activity, symptom management, and other information related to the support system. The results of this study support the results of previous studies and literature reviews [12–16]. This showed the importance of nurses in providing health information in these nine important areas. There was a need for patient education that should be responded to quickly through health education by health personnel, especially nurses.

The three patient groups had similarities in the first priority about the important information, which was the domain of medication information. The information cardiac patients most needed before being discharged from the hospital was about medication [14,15] and had not decreased over time following the onset of myocardial infarction [17]. After being discharged from the hospital, patients are required to be independent regarding medication, so patients need to know the drug's action and side effects [18]. There were various possible reasons why patients consider information about medication important. One was that patients understand that the treatment of myocardial infarction takes a long time and therefore feel it important to understand as much as possible about their medication.

The health information occupying the lowest priority among the nine domains in the CVCU and the cardiac ward regarded physical activity. This finding supports that of a previous study [19]. During acute and sub-acute phases, patients instructed to minimize activity according to American Heart Association (AHA) [20] and European Society of Cardiology (ESC) [21] guidelines. Therefore, patients were not particularly interested in information related to increased activity, and patients tended to focus on improving their adherence to current management programs. For patients in the polyclinic, the average lowest score was on the miscellaneous

**Table 5**

Resume of significant Differences in Perception among Eight Respondent Groups toward Learning Need of Patient with Myocardial Infarction.

| Respondent groups          |                                  | Mean Difference | Standard Error | P     |
|----------------------------|----------------------------------|-----------------|----------------|-------|
| Cardiac Ward Patient       | Cardiac Polyclinic Patient       | 0.23            | 0.06           | 0.003 |
|                            | Cardiac Polyclinic Family Member | 0.37            | 0.10           | 0.009 |
| Cardiac Polyclinic Patient | CVCU Family Member               | −0.24           | 0.07           | 0.043 |
|                            | Cardiac Polyclinic Family Member | 0.37            | 0.11           | 0.020 |
| CVCU Family Member         | CVCU Patient                     | 0.39            | 0.10           | 0.010 |
|                            | Cardiac Polyclinic Patient       | 0.52            | 0.09           | 0.000 |
| CVCU Nurses                | Cardiac Ward Family Member       | 0.34            | 0.09           | 0.017 |
|                            | Cardiac Polyclinic Family Member | 0.66            | 0.13           | 0.000 |
| Cardiac Ward Nurse         | CVCU Patient                     | 0.63            | 0.09           | 0.000 |
|                            | Cardiac Ward Patient             | 0.53            | 0.08           | 0.000 |
| Cardiac Polyclinic Patient | Cardiac Polyclinic Patient       | 0.76            | 0.08           | 0.000 |
|                            | CVCU Family Member               | 0.52            | 0.09           | 0.000 |
| Cardiac Ward Family Member | Cardiac Ward Family Member       | 0.59            | 0.08           | 0.000 |
|                            | Cardiac Polyclinic Family Member | 0.90            | 0.12           | 0.000 |

domain. These patients felt they already had support and information about advanced follow-up through visits to the polyclinic; therefore, they did not feel it important to get information about it.

There were differences in cardiac patient learning needs according to the treatment phase. Patients treated in the cardiac ward successfully completed the acute phase and were undergoing sub-acute phase treatment. In this phase, patients' conditions had generally improved so that they perceived their pain had decreased, their hemodynamic status stabilized, and their ability to perform daily activities increased. During this phase, the patient began to feel the need for health information related to the etiology of the disease to improve self-care after returning home. This need increased because the patient's ability to absorb information began to improve after a reduction in stress from a heart attack that may have affected cognitive abilities [13]. The sub-acute care phase is the best time to provide health information for cardiac patients because the patient had recently experienced a memorable event and is aware of the need for information.

Information given immediately after the event and when the patient is ready to receive it is expected to be better absorbed by the patient and to affect long-term patient behavior. In addition, this increased information requirement suggests that the patient wants to prepare before returning home from the hospital. Returning home from the hospital also means having less interaction with health services. In preparation for self-care at home and preparation as care begins to shift from health services, patients want information from health workers [21]. Expected outcomes are the active participation of patients in post-myocardial infarction care and to reduce the risk of recurrent myocardial infarction.

Patients in cardiac polyclinics have lower information needs than other patient groups. This is in line with previous research [17]. There was a decreased need for cardiac patient information over time following myocardial infarction, and there were variations of information sources selected by the patient. In addition, patients will also more easily connect with various sources of information and show a decrease in dependence with information from nurses provided in the form of health education.

Ultimately, regardless of the level of learning needs and priorities of information and the stages of disease and healing process, provision of knowledge through health education was the key for improvement of the patient's active role in self-care following myocardial infarction. Appropriate health education information in accordance with the needs of patients at the time and methods that evolved following the changing needs of patients needs to be central to the development of a health education model for patients with myocardial infarction. Health education on lifestyle modification was conducted so that patients together with health workers can set target behavior change at home [22].

#### 4.2. Cardiac patient learning need according to patients' families

According to family member perception, the patient with myocardial infarction needs health education related to the disease, causes, and treatment process to empower him or her. This supports the importance of providing health education to patients with heart disease and their family member, so that the patient's family can contribute to patient care.

Few previous studies assessed family member perceptions of cardiac patient learning needs [23]. Nevertheless, the results of this study and previous studies were strong enough to demonstrate that family member perceptions of cardiac patient learning needs were not significantly different from patients' perceptions and family member needs on health education nor were they significantly different from those of patients. Involving family members in health education was expected to create a strong support system

for the healing process of patients.

The three groups of family member respondents indicated a slightly different domain of learning priority. The domain of learning needs that was the first priority for family members in the CVCU was symptom management. Family members are often required to respond quickly in the event of a heart attack. Therefore, the family member perceives the importance of patients getting information about symptoms management as soon as the patient begins to experience symptoms [23]. These results can also mean that the family member believes it is important to know the immediate steps to be taken in the event of a subsequent heart attack because a person who has had a myocardial infarction had a higher risk of experiencing recurrent attacks.

Of the three groups of family member respondents, the family member group in the CVCU perceived the cardiac patient learning needs with the highest average score. Family member awareness of the need for health information and health education was potential for families to feel equipped to increase healthcare responsibilities for their family member.

#### 4.3. Cardiac patient learning need according to nurse perception

Nurses in the CVCU and cardiac ward perceived that cardiac patients' learning needs were high. This showed nurses' awareness of the importance of providing information to the patient as part of the fulfilment of the nurse's role as a patient educator. The results of this study demonstrated consistency with previous studies, in which the nurse perceived the high need for cardiac patient information [18,23–25]. The findings of this research need to be followed up by an effective and efficient model for providing health education to patients in accordance with the stages of the disease process and healing.

The domain of learning needs of cardiac patients that nurses in the CVCU considered the first priority was introduction to the cardiac care unit, whereas nurses in the cardiac ward perceived medication information was the first priority. Nurses needed to know the area of learning the patient needed so that appropriate information was provided [18]. Previous research results also indicated that nurses in advanced care rooms perceived that medication information was the first priority for patient information needs [24], particularly by nurses in sub-acute care. One of the reasons that might explain the results of this study was that myocardial infarction is a life-threatening condition that requires pharmacologic management and should be done for long term.

#### 4.4. Differences in cardiac patient learning need

Overall, there were differences in perceptions of the eight respondent groups regarding cardiac patient learning needs. There was a gap between patient and family member perceptions and nurse perceptions. The average nurse's perception score far outweighs the patient's and family member perceptions of learning needs. Nurses need to assess learning needs before providing health education to patients. The nurse can plan a standardized health education program for the patient, but in practice, it is necessary to pay attention to what information the patient needs [18].

Previous studies showed inconsistencies. There was a difference in the need for cardiac patient information according to the patient's perception and nurse's perception, but there was no difference in cardiac patient information needs according to the perceptions of family members and nurses [23]. In contrast, other studies have shown that there was no difference in the perception of nurses and patients regarding the learning needs of patients with myocardial infarction [18,26]. Previous research found that patients and nurses had similar perceptions of what patients need to know

about the illness during their stay in the hospital, and even more so when the patient has returned home. Nevertheless, the domain of learning of the three groups of respondents in the cardiac ward deemed most important was the same: medication information. Learning needs identified by health professionals, as well as actual needs expressed by patients, can be incorporated into health education [25].

## 5. Conclusions

This study provided an original contribution to the study of patient learning needs following myocardial infarction and changes in cardiac patient learning needs in accordance to disease and healing processes, as well as differences in perception between patients and their families related to information desired by patients following myocardial infarction. In addition, the results of this study also showed differences in patient, family member, and nurse perceptions related to information required by patients with myocardial infarction. Medication information domain was priority among patient whereas symptom management domain was priority among family member. Therefore, to meet patient's learning needs, an accurate assessment should be performed prior to intervention. The results of this study supported the importance of patient-centered, individualized information and attention to learning priorities. Because of high needs of patient and family members, nurse should meet their needs through health education and it could improve satisfaction.

Based on the results of this study, further research is recommended to develop quality standardized information and education that can meet the learning needs of patients with myocardial infarction during acute, sub-acute, and post-acute care in accordance with the priority of information required by patients at the time. Through these activities, it is expected to maximize learning process. Health education activities should be supported by a formal system to ensure the provision of quality health education for patients with myocardial infarction. This change is expected not only to benefit patients and families, but also to assist in the effective and efficient implementation of the nurse's role as an educator.

## Ethics approval and consent to participate

Ethical approval was provided by Medical Research Ethics Committee of Faculty of Medicine Universitas Andalas (reference: 303/KEP/FK/2017). For protection of human subjects, patient, family and nurse were given explanation about the study. Respondents who agreed to participate in this study were asked to sign written informed consent.

## Competing interests

The author declare that she has no competing interests.

## Funding

Fund for fundamental research, from operational support for public higher education institution (BOPTN), Universitas Andalas. The funding body played no role in the design, execution, analysis, data interpretation, writing of the report or decision to submit the paper for publication.

## Acknowledgement

The author would like to thank to data collection team from

Faculty of Nursing Universitas Andalas for contribution on data collection. We also thank the participating patients, family, nurses and staff at M Djamil Hospital for their contribution to this research.

## References

- [1] World Health Organization (WHO). Global Status Report in non-communicable diseases 2014. Geneva: World Health Organization; 2014.
- [2] Sanchis-Gomar F, Perez-Quilis C, Leischik R, Lucia A. Epidemiology of coronary heart disease and acute coronary syndrome. *Ann Transl Med* 2016;4(13): 256–256.
- [3] Ohira T, Iso H. Cardiovascular disease epidemiology in Asia: an overview. *Circ J* 2013;77:1646–52.
- [4] Hata J, Kiyohara Y. Epidemiology of stroke and coronary artery disease in asia. *Circ J* 2013;77:1923–32.
- [5] World Health Organization (WHO). Non communicable diseases country profiles [Internet]. Genève : WHO Press; 2014. Geneva; 2014. Available from: [http://www.who.int/nmh/countries/ben\\_en.pdf?ua=1](http://www.who.int/nmh/countries/ben_en.pdf?ua=1).
- [6] Mozaffarian D, Benjamin EJ, Go AS, Arnett DK, Blaha MJ, Cushman M, et al. Heart disease and stroke statistics-2016 update a report from the American Heart Association. *Circulation* 2016;vol. 133:38–48.
- [7] Gallagher R, Sullivan A, Hales S, Gillies G, Burke R, Toffler G. Symptom patterns, duration and responses in newly diagnosed patients with heart failure. *Int J Nurs Pract* 2012;18(2):133–9.
- [8] Mohammadpour A, Sharghi NR, Khosravan S, Alami A. Investigating the level of self-care and supportive-educative needs of patients with myocardial infarction, based on Orem's model. *J Res Heal* 2013;3(4):489–96.
- [9] Polikandrioti M, Ntokou Ma. Needs of hospitalized patients. *Health Sci J* 2011;5(1):15–22.
- [10] Gentil LLS, Costa ALS. Discharge planning after myocardial revascularization differences in opinions from patients and health experts. *J Cardiovasc Nurs* 2016;31(5):441–4.
- [11] Seraji M, Rakhshani F. Evaluation of the effect of educating self care behavior of heart failure patients on economy of health. *Int J Med Res Health Sci* 2016;5(8):279–84.
- [12] Gerard P, Peterson L. Learning needs of cardiac patients. *Cardiovas Nurs* 1984;20:7–11.
- [13] Polikandrioti M, Babatsikou F. Information to coronary disease patients. *Health Sci J* 2013;7(1):3–10.
- [14] Yu M, Chair S, Chan C, Li X, Choi K. Perceived learning needs of patients with heart failure in China: a cross-sectional questionnaire survey. *Contemp Nurse* 2012;41(1):70–7.
- [15] Eshah N. Jordanian acute coronary syndrome patients' learning needs: implications for cardiac rehabilitation and secondary prevention. *Nurs Health Sci* 2011;13(3):238–45.
- [16] Kim S, Ahn J, Kang S, Kim G, Lee S. Learning needs of patients with heart failure: a descriptive, exploratory study. *J Clin Nurs* 2013;22:5–6.
- [17] Sultana R, Petpichetchian W, Kritpracha C. Patients' discharge information needs regarding myocardial infarction in Bangladesh. *Songklanagarind J Nurs* 2015;35(3):1–14.
- [18] Greco A, Cappelletti ER, Monzani D, Pancani L, Addario MD, Magrin ME, et al. A longitudinal study on the information needs and preferences of patients after an acute coronary syndrome. *BMC Fam Pract* 2016;17:136.
- [19] Ong S-F, Foong PP-M, Seah JS-H, Elangovan L, Wang W. Learning needs of hospitalized patients with heart failure in Singapore. *J Nurs Res* 2018;26(4): 250–9.
- [20] O'Gara PT, Kushner FG, Ascheim DD, Casey DEJ, Chung MK, de Lemos JA, et al. ACCF/AHA guideline for the management of ST-elevation myocardial infarction: executive summary: a report of the American college of Cardiology foundation/American heart association task force on practice guidelines. *2013 Circulation* 2013;127.
- [21] Roffi M, Patrono C, Collet J-P, Mueller C, Valgimigli M, Andreotti F, et al. ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation. *Eur Heart J* 2015;32(23): 2999–3054. 2015.
- [22] Mercado MG, Smith DK, McConnon ML. Myocardial infarction: management of the subacute period. *Am Fam Physician* 2013;88(9):581–8.
- [23] Smith J, Liles C. Information needs before hospital discharge of myocardial infarction patients: a comparative, descriptive study. *J Clin Nurs* 2007;16(4): 662–71.
- [24] Uysal H, Enç N. A Turkish version of the cardiac patients' learning needs inventory: patient questionnaire (TR-CPLNI): reliability-validity assessment. *Int J Caring Sci* 2012;5(3):264–79.
- [25] Yu M, Chair S, Chan C, Choi K. Information needs of patients with heart failure: health professionals' perspectives. *Int J Nurs Pract* 2016;22(4):348–55.
- [26] Hamdan FRS, Al-Momani IN. Jordanian nurses and acute myocardial infarction patients' perceptions about learning needs. *Glob J Med Phys Heal Educ* 2015;3(3):85–99.