Original Articles

Perceived Exercise Self-Efficacy and Exercise Behavior in Persons with Myocardial Infarction in Indonesia

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Abstract

The aims of this study were to (1) describe perceived exercise self-efficacy and exercise behavior; and (2) investigate the relationship between perceived exercise self-efficacy, exercise behavior and other selected variables among persons with myocardial infarction (MI) in Indonesia. A descriptive correlational design was used in this study. There were 60 hospitalized patients with MI completed the Self-Efficacy in Cardiac Health Behaviors Scale (SECHBS), and Modified Myocardial Infarction Health Behaviors Questionnaire (Modified MIHBQ). Data were analyzed using descriptive and correlational statistics.

The results revealed that 48.3% of persons with MI reported low exercise self-efficacy with a mean score of 6.07. The majority of the persons with MI reported a moderate level of exercise behavior (53.3%). Regarding exercise behavior, 16.7% of the persons reported never exercised, and 26.7% of the persons never exercised for more than 30 minutes each time. Ninety-five percent of the persons never measured their pulse and scored their rate of perceived exertion (RPE) to meet the exercise intensity recommendation. Perceived exercise self-efficacy had a positive statistically significant relationship with exercise behavior ($r = 0.44$, $p < 0.01$), which also had a relationship with incomes and types of MI.

This study showed that persons with MI had low perceived exercise self-efficacy and exercise behavior. The perceived exercise self-efficacy had a positive relationship with exercise behavior, which also had a relationship with incomes and types of MI. Therefore, healthcare providers are recommended to promote exercise self-efficacy and focus on the variables which influence persons with MI to exercise regularly.

Keywords: myocardial infarction; exercise behavior; perceived exercise self-efficacy

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Background

Cardiovascular disease is the number one cause of death worldwide and is commonly related with myocardial infarction.[1] The World Health Organization (WHO) reported that there were 17.3 million deaths in 2008 due to cardiovascular disease, with 42% of all cardiovascular deaths related to a myocardial infarction.[1] In a developing and transitional country like Indonesia, the incidence of myocardial infarction (MI) is increasing as a result of increasing longevity and life style change, where people are exposed to risk factors of cardiovascular disease (CVD) for long periods.[2]

Exercise has been proved to be beneficial for persons with CVD. Exercise is one of the essential components of cardiac rehabilitation that will help persons to increase physical functioning, and improve both cardiovascular function and blood pressure control while concurrently reducing the risk of another cardiac event.[3] Long-term exercise results in the reduction of several cardiovascular risk factors and atherosclerosis progression.[4] Persons with heart disease who do not exercise sufficiently can be exacerbate other CVD risk factors, such as high blood cholesterol and triglyceride levels, high blood pressure, diabetes and obesity.[5]

Exercise is not only essential as primary prevention of MI. In addition, persons with MI are required to perform regular exercise after their first cardiac event to promote cardiac function and prevent another cardiac event. Unfortunately, Dorn, Naughton, Imamura, et al.[6] reported that, compliance with exercise programs among persons with MI decreased over time and those persons were at higher risk for repeat events than those who complied with exercise program. Only about 15% of adults in the United States engage in regular physical exercise, and of those who joined an exercise program, 50% will drop out within three to six months.[7] Regular exercise results in an increase in exercise capacity and lower myocardial oxygen demand, leading to cardiovascular benefits such as lower mortality rates and fewer symptoms of coronary artery disease (CAD).[4]

One behavioral theory that has been proposed for use in the cardiac rehabilitation (CR) setting is Bandura's theory of self-efficacy.[8] Self-efficacy is a cognitive mechanism that mediates behavior change, influences participation in various activities, and determines the amount of effort and degree of persistence in pursuing the activity.[7] Despite the fact that perceived self-efficacy showed a positive influence on health behaviors,[7,9] the description of exercise self-efficacy, exercise behavior, and relationship between self-efficacy, exercise behavior and other variables among persons with MI, particularly in Indonesia are not clear yet. Therefore, this study explored perceived self-efficacy of exercise and exercise behavior, and examined the relationship between these variables among persons with MI in Indonesia.

Objectives of the Study

1. To describe perceived exercise self-efficacy among persons with MI in Indonesia
2. To describe exercise behavior among persons with MI in Indonesia
3. To examine the relationship between perceived exercise self-efficacy, exercise behavior, and other selected variables among persons with MI in Indonesia

Conceptual Framework

The conceptual framework used in this study was the self-efficacy theory. Self-efficacy is defined as an individual's belief in his or her capabilities to successfully execute a skill or target behaviors.[10] Specifically, self-efficacy is the primary mechanism for changing an individual's belief that performing a certain activity will be successful and have a positive influence on health behaviors.[9] According to the cognitive social-learning theory, the most essential factor for behaviors change is a person's sense of self-efficacy or the belief that one is able to successfully to execute the behaviors required to produce the desired outcome. In case an individual lacks confidence that they can indeed change, their efforts are not likely to succeed.[10]

Exercise self-efficacy refers to an individual's belief of his or her capabilities to exercise with moderate intensity three or more times a week regularly in the face of identified obstacles to participation.[11] Everett, Salamonson, and Davidson[12] defined exercise self-efficacy as persons' confidence in their ability to perform exercise regularly or most days of the week.

Methodology

Sample and Sampling

The sample of this study was selected from the CICU (cardiac intensive care unit) and the HCCU (high cardiac care unit) of Hasan Sadikin Hospital, Indonesia. Hasan Sadikin Hospital is a tertiary hospital located in West Java Province, Indonesia. Convenience sampling was used as the sampling procedure of this study. The persons who met the inclusion criteria were approached to determine their willingness to participate in the study.

The criteria for selecting subjects for this study are as follows: (1) age > 18 years; (2) confirmed diagnosis of myocardial infarction; (3) no cognitive impairment; (4) agree to participate in the study; (5) be able to communicate in the Indonesian language; (6) stable hemodynamic levels; and (7) no chest pain or dyspnea. There were 60 hospitalized MI persons involved in this study and who completed the questionnaires.

Instruments

The instruments used to collect data in this study were the Demographic Data and Health Related Questionnaire (DDHQ), Self-Efficacy in Cardiac Health Behaviors Scale (SECHBS), and Modified Myocardial Infarction Health Behaviors Questionnaire (Modified MIHBQ). The

DDHQ was used to collect the person's demographic and health related data. The DDHQ was developed by the researcher. It included age, gender, marital status, education, monthly incomes, occupation, number of times hospitalized, disease, and treatment.

The SECHBS was used to assess the exercise self-efficacy and modified by the researcher based on the self-efficacy theory and cardiac rehabilitation guideline established by the American Heart Association (AHA).[13-14] The SECHBS is composed of an exercise self-efficacy scale to rate persons' confidence to perform exercise. The person's self-confidence was rated on a scale of 0 to 10. The higher the score, the more confident the subject is to perform exercise.[15] A score less than 7 was interpreted as low self-efficacy.[7] The reliability was tested and yield Cronbach's alpha coefficient 0.79.

The Modified MIHBQ is a self-reported health behaviors questionnaire. It was modified from the MIHBQ that was developed by Ahyana[16] based on cardiac rehabilitation and a secondary prevention guideline established by the AHA. The Modified MIHBQ is composed of 34 items which cover 5 subscales including medication adherence, exercise behavior, dietary behavior, stress management, and smoking cessation. However, only the exercise behavior subscale which consists of eight questions was used to test in this study. The score for each question ranged from one to four. An explanation follows: 1 = never (never perform the activity), 2 = sometimes (3 - 4 times per month), 3 = often (3 - 4 times per week), and 4 = routinely (5 - 7 times per week). For some negative questions, the score was reversed. The total score ranges from 8 to 32, higher scores indicate more exercise behavior performance.[15] Cronbach's alpha coefficient revealed a reliability score of 0.81.

Ethical Consideration

This study was approved by the Research Ethics Committee of Faculty of Nursing, Prince of Songkla University (MOE 0521.1.05/2524) and Hasan Sadikin Hospital (LB.02.01/C02/14463/X/2014). The purpose of the study was explained to the potential subjects by the researcher, participation in this study was voluntary, and their anonymity would be ensured; the data would remain confidential and they had the right to refuse to participate in the study or withdraw at any time without any negative consequences. Persons who agreed to participate signed the consent form before starting data collection.

Data Collection

All of the persons who met the inclusion criteria and agreed to participate in the study were approached. Persons were asked to fill out the set of questionnaires including the DDHQ, SECHBS, and MIHBQ. The completed questionnaires were returned directly and the researcher checked the questionnaires for completion then coded the questionnaires to ensure anonymity of the participants.

Data Analysis

Data were analyzed using descriptive and correlational statistics. Descriptive statistics were used to describe characteristics of the sample by using frequency, percentage, mean, and standard deviation. Preliminary testing was done to meet the assumption of parametric testing prior to running the parametric tests. Pearson's product-moment correlation statistic (r) was calculated to examine the relationship between perceived exercise self-efficacy, exercise behavior, and other selected variables among MI persons.

Results

Characteristics of the participants

Characteristics of the participants are presented in table 1.

Table 1 Frequency, Percentage, Means, and Standard Deviations of the persons' demographic data (N = 60)

Characteristic	N	%
Age (range 37 - 79 years) M = 56.33; SD = 9.25		
Gender		
Male	47	78.30
Female	13	21.70
Marital status		
Married	57	95.00
Widower/ Widow	3	5.00
Educational level		
No schooling	5	8.34
Elementary school	11	18.33
Junior high school	9	15.00
High School	24	40.00
College or higher	11	18.33
Monthly incomes		
< 1million IDR (< 76.97 USD)	16	26.70
1 - 2 million IDR (76.97 - 153.93 USD)	17	28.30
2 - 4 million IDR (153.93 - 307.87 USD)	12	20.00
> 4 million IDR (> 307.87 USD)	15	25.00
Occupation		
Entrepreneur	20	33.33
Government employee	7	11.67
Private sector employee	6	10.00
Farmer	1	1.66
Retired	7	11.67
Unemployed	19	31.67

Table 1 (cont.)

Characteristic	N	%
Number of time hospitalized		
1	39	65.00
2	12	20.00
3	5	8.30
>3	4	6.70
Types of MI		
STEMI	49	81.70
NSTEMI	11	18.30
MI Treatment		
Medication	19	31.70
PCI	41	68.30

Exercise Self-Efficacy and Exercise Behavior

The results are showed in table 2, 3, and 4.

Table 2 Mean and standard deviation of exercise self-efficacy (N = 60)

Variable	N	%
Exercise Self-efficacy; M = 6.07; SD = 2.64		
Low self-efficacy (score < 7)	29	48.30
High self-efficacy (score ≥ 7)	31	51.70

Table 3 Frequency, Percentage, Means, and Standard Deviations of the Subjects Exercise Behavior (N = 60)

Exercise behavior	N	%
Total exercise behavior (range 8 - 32) M = 20.10; SD = 4.97		
Frequency of exercise		
Never	10	16.70
Sometimes (3 - 4 times/month)	25	41.70
Often (3 - 4 times/week)	11	18.30
Routinely (5 - 7 times/week)	14	23.30
Duration of exercise (Exercise at least 30 minute each time)		
Never	16	26.70
Sometimes (3 - 4 times/month)	23	38.30
Often (3 - 4 times/week)	8	13.30
Routinely (5 - 7 times/week)	13	21.70
Intensity of exercise (Rate of Perceived Exertion [RPE])		
Never	57	95.00
Sometimes (3 - 4 times/month)	3	5.00

Table 3 (cont.)

Exercise behavior	N	%
Intensity of exercise (Check the pulse)		
Never	57	95.00
Sometimes (3 - 4 times/month)	2	3.30
Routinely (5 - 7 times/week)	1	1.70
Intensity of exercise (Stop exercise when have chest pain or dyspnea)		
Never	22	36.70
Sometimes (3 - 4 times/month)	6	10.00
Often (3 - 4 times/week)	5	8.30
Routinely (5 - 7 times/week)	27	45.00
Overcoming the barriers		
Never	15	25.00
Sometimes (3 - 4 times/month)	17	28.30
Often (3 - 4 times/week)	12	20.00
Routinely (5 - 7 times/week)	16	26.70
Consistency in performing exercise		
Never	7	11.66
Sometimes (3 - 4 times/month)	10	16.67
Often (3 - 4 times/week)	24	40.00
Routinely (5 - 7 times/week)	19	31.67
Desire to perform exercise		
Never	5	8.30
Sometimes (3 - 4 times/month)	12	20.00
Often (3 - 4 times/week)	28	46.70
Routinely (5 - 7 times/week)	15	25.00

Table 4 Frequency and percentage of level of total exercise behavior (N = 60)

Level of exercise behavior	N	%
Low (score range 8 - 16)	16	26.70
Moderate (score range 17 - 24)	32	53.30
High (score range 25 - 32)	12	20.00

The results of the bivariate correlational analysis using Pearson correlation coefficients (r) are presented in table 5. The results show that perceived exercise self-efficacy has a positive statistically significant relationship with exercise behavior ($r = 0.44$, $p < 0.01$). Age, gender, marital status, educational level, occupation, hospitalization, and treatment did not show any significant correlation with exercise self-efficacy and exercise behavior.

Monthly incomes show a positive significant relationship with exercise self-efficacy ($r = 0.25$, $p < 0.05$), and exercise behavior ($r = 0.33$, $p < 0.01$). Types of MI that are divided into ST Segment Elevation Myocardial Infarction (STEMI) and Non-ST Segment Elevation Myocardial Infarction (NSTEMI) show a negative significant relationship with exercise self-efficacy ($r = -0.32$, $p < 0.05$), whereas there is no significant relationship with exercise behavior ($r = 0.05$, $p > 0.05$).

Table 5 Correlation (r) between perceived exercise self-efficacy, exercise behavior, and other selected variables among MI persons

Variable	Exercise self-efficacy (r)	Exercise behavior (r)
Exercise Self-efficacy	1	0.44**
Exercise behavior	0.44**	1
Age	-0.10	-0.14
Gender	-0.03	-0.06
Marital status	0.0	0.07
Educational level	0.15	0.17
Monthly incomes	0.25*	0.33**
Occupation	-0.11	-0.18
Number of hospitalization	-0.11	0.14
Types of MI (STEMI and NSTEMI)	-0.32*	0.05
MI treatment (PCI and medication)	0.181	0.11

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Discussion

In this study, the mean score of exercise self-efficacy was 6.07 which shows low self-efficacy. Furthermore, 48.3% of the persons reported low exercise self-efficacy of which their score was less than 7. The finding of this study was similar with previous study reported that persons with MI had a low self-efficacy level.[17]

Persons with MI should be encouraged to exercise, whether they have already experienced a cardiac event or not. Exercise prescription should specify frequency (F), intensity (I), and duration (D). The Centers for Disease Control and Prevention (CDC), American College of Sports Medicine (ACSM) and Surgeon General recommends that adults perform moderate-intensity levels exercise for a duration of 30 minutes at least 5 days per week.[4] However, this study shows that 41.70% of the subjects only exercised three to four times a month, and 16.67% never exercised. In addition, 26.70% did not meet the time requirement of at least 30 minutes when exercising. Thus, this situation does not meet the exercise frequency recommendation to reduce the risk of MI.[7]

The ACSM recommends the intensity in phase 1 CR of post MI persons including the heart rate up to 120 beats/minute, and be guided by symptoms of chest pain and dyspnea (Borg's rating of perceived exertion < 13). In this study, 95% of the persons did not know the exercise recommendations and never rated their score of RPE (rate of perceived exertion) before, during and after exercise. They reported that they did not know that they should measure their pulse before exercise and they did not know how to measure HR. Particularly, self-measurement of pulse HR was reported difficult for elderly persons since they experienced counting and finding their pulse difficult. Therefore, nurses can teach pulse HR measurement to family or caregivers.[18]

Importantly, 36.70% of the subjects in the present study continued to exercise, even though they had chest pain or dyspnea. This finding indicated that these persons lacked of knowledge of signs and symptoms of heart disease. This lack of knowledge can lead to a harmful event for persons with MI while exercising. Consequently, a bad experience of that nature results in low self-efficacy to perform exercise in the future.

There were 53.30% of the subjects reported a moderate level of exercise behavior. There are actual and perceived barriers that lead persons with CVD avoid exercise, including impaired physical functional capacity and condition-related symptoms such as dyspnea and fatigue, fear of injury or another cardiac event, and distance of the facility,[19] fear of worsening their heart condition, and having a heart attack.[20]

The results show that individuals with a high level of exercise self-efficacy are more likely to exercise, and this finding is congruent with a previous study.[21] Self-efficacy has been shown to be an important predictor of exercise behavior.[12] Conversely, low self-efficacy is associated with drop out behavior.[7] Therefore, persons with MI in this study with a low level of self-efficacy, regarding exercise, clearly do not adhere to their recommended exercise behavior.

Interestingly, the results of this study show that types of MI which divided into STEMI and NSTEMI had a negative significant relationship with exercise self-efficacy, whereas there was no significant relationship with exercise behavior. By performing additional analysis using independent t-test, the finding showed that persons with NSTEMI tended to have higher score of exercise self-efficacy than persons with STEMI. This finding is similar to a previous study which reported that lower cardiac self-efficacy was associated with greater symptom impact.[22] Persons with STEMI were significantly more likely to be smokers prior to an acute MI and reported a significantly higher number of symptoms than persons with NSTEMI. Persons with STEMI were significantly more likely to complain of vomiting, dizziness, diaphoresis, and a higher intensity of pain or discomfort than persons with NSTEMI.[23] The higher number of syptoms experienced by persons with STEMI might lead them to have a lower exercise efficacy than persons with NSTEMI.

Conclusion and Recommendations

This study found 48.30% of participants have a low level of exercise self-efficacy and 53.30% of participants have moderate level of exercise behavior. In addition, perceived exercise self-efficacy has a positive statistically significant relationship with exercise behavior which also relates to incomes and types of MI. Thus, it is important for healthcare providers to promote exercise self-efficacy and focus on the variables which influence persons with MI, and ultimately, to encourage them to exercise regularly. To conclude, an experimental study that develops and tests a self-efficacy program to promote exercise behavior for persons with MI is recommended for further study.

Limitation of the Study

The sample in this study is considered small. The results might not be generalized to Indonesia persons who have MI.

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