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Phase I Cardiac Rehabilitation In Patients With Coronary Heart Disease

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ABSTRACT
This literature study was made by analyzing retrospective minimal scientific articles published in 2010 to 2020 in Indonesian and English. Data obtained from the database includes pubmed, DOAJ, proquest and google scholar with the keywords cardiac rehabilitation, acute coronary syndrome, arrhythmia, acute myocardial infarction, mobilization, six minute walk test and physical exercise. The study results obtained were 8 articles that match the inclusion and exclusion criteria. The results of the study found that implementation of phase I cardiac rehabilitation in patients with CHD accompanied by dysrhythmias/arrhythmias can be recommended for rehabilitation after 12 hours post attack. Phase I cardiac rehabilitation measures begin with education and counseling, exercise or physical activity, breathing exercises, breathing muscle exercises, chest physiotherapy, breathing muscle stretching exercises, and gradual mobilization using the six minute walk test technique.

Keywords: Cardiac Rehabilitation, Acute Coronary Syndrome, Mobilization, Six Minute Walk Test and Physical Exercise

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BACKGROUND

Heart disease is one of the leading causes of death worldwide (WHO, 2017). Cardiovascular disease is a global cause of death, accounting for 17.3 million deaths per year, a figure which is expected to increase to more than 23.6 million by 2030 (AHA, 2014). In the United States heart disease is the number one cause of death, resulting in the deaths of more than 375,000 people per year. The 2014 AHA reports 735,000 people in the United States have a heart attack each year and about 120,000 die. WHO 2017 reports that more than 3/4 of deaths from cardiovascular disease occur in low to medium income developing countries. Data from the Ministry of Health of the Republic of Indonesia, (2017) from a sample registration system (SRS) survey in 2014 in Indonesia showed that coronary heart disease (CHD) is the highest cause of death for all ages after stroke, which is 12.9%.

More than 3/4 of deaths from cardiovascular disease occur in low to moderate income developing countries. According to data from the Ministry of Health of the Republic of Indonesia, (2017) from a survey sample registration system (SRS) in 2014 in Indonesia, it shows that CHD is the leading cause of death for all ages after stroke, which is 12.9%. Riskesdas 2013 data shows, the highest prevalence for heart disease in Indonesia is CHD, especially in STEMI cases, which is 1.5%. Of this prevalence, the highest rate was in the Province of East Nusa Tenggara (4.4%) and the lowest was in Riau Province (0.3%), for DKI Jakarta (1.6%). According to the age group, SKA mostly occurred in the age group 65-74 years (3.6%) followed by the age group 75 years and over (3.2%), the age group 55-64 years (2.1%) and the age group 35-44 years (1.3%). Meanwhile, according to economic status, most were at the lower economic level (2.1%) and the lower middle class (1.6%).

Patients who experience CHD will have an impact on their physical and psychological problems, such as anxiety, stress, depression, changes in ability or strength in activities for life, work, social society and changes in spiritual responses that can affect the patient's quality of life (Carney, & Grace, 2015; Yulianti, Kosasih, & Emiliyawati, 2012). For this reason, it is necessary to take preventive measures in reducing these problems, as well as helping patients to speed up recovery after CHD treatment. The right action to accelerate the recovery is cardiac rehabilitation, in which cardiac rehabilitation is a program that combines several physical, psychological and educational interventions. This program aims to optimize both physical, psychological and social function conditions so as to reduce morbidity and mortality rates, as well as improve the quality of life in patients with CHD (Foundation, 2011).

According to the rehabilitation guide for the Indonesian Heart Association (2019) cardiac rehabilitation is divided into three phases with all phases of cardiac rehabilitation being important for patients with CHD. The phase I cardiac rehabilitation program was started in patients with coronary heart disease (CHD) after 12 hours of treatment by considering the contraindications for rehabilitation, to avoid worsening the patient. This phase I cardiac rehabilitation is carried out on patients who are undergoing treatment at the hospital until the patient is discharged from the hospital by carrying out educational actions, breathing exercises, gradual physical exercise, and stress management and anxiety management (Winkelmann, et al., 2015) .

Several studies regarding phase I cardiac rehabilitation state that patients undergoing rehabilitation will show an increase in oxygenation of the blood circulation and an increase in functional capacity and an increase in quality of life (Sadeghi, et al, 2012; Parvand, et al, 2016). Another systematic review study also states that early mobilization measures carried out in post-thoracic / heart surgery patients show good results for patients such as reducing length of stay,

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increasing the patient's functional life capacity, and preventing patients from developing complications and rehospitalization (Santoso, Ricci, 2013). et al, 2016).

Phase I cardiac rehabilitation is an action that teaches patients in the form of breathing exercises, mobilization and physical exercises. The progress of this phase I exercise program will be measured by the patient doing a six minute walk test (6MWT), where patients who can do 6MWT without any hemodynamic changes will undergo rehabilitation phases II and III. In Cassina's research, Putzu, Villa, et al (2016) stated that this phase I rehabilitation will improve the patient's hemodynamic status and reduce the patient's stress and anxiety level about his disease.

Cardiac rehabilitation is a safe procedure for patients with heart disease. Even so, the phase I cardiac rehabilitation program is still carried out differently in patients with heart disease, especially CHD. Therefore, the researchers are interested in conducting a literature review regarding what phase I cardiac rehabilitation measures are safe to do in CHD patients with dysrhythmias/arrhythmias.

METHODS

Literature studies are carried out by making analyzes and summaries of each article related to the research questions and objectives. The search method uses several electronic articles, namely pubmed, DOAJ, proquest and google scholar with the keywords cardiac rehabilitation, acute coronary syndrome, arrhythmia, acute myocardial infarction, mobilization, six minute walk test and physical exercise. Inclusion criteria: 1). Scientific papers or articles that have titles and contents that are in accordance with the research objectives; 2). Indonesian or English and full text; 3). Minimum cohort scientific papers or research articles published in 2010-2019. Exclusion criteria: 1). Does not have a complete article structure or scientific papers; 2). Review article.

RESULT

Based on the search by entering keywords obtained from Pubmed as many as 1985 articles, DOAJ sbenyak 68 articles, proquest as many as 435 articles, and google scholar as many as 4184 articles, so a total of 6672 articles. After the search results are obtained, it will be sorted with inclusion criteria and obtained from Pubmed as many as 18 articles, DOAJ sbenyak 8 articles, proquest as many as 6 articles, and google scholar as many as 38 articles, for a total of 70 articles. There are 8 articles that are the same so that it becomes 62 articles. However, only 21 articles had the structure of an article and only provided phase I cardiac rehabilitation measures. Then searches and scans were carried out, and there were only 8 articles that matched the inclusion criteria.

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Figure 1. Flow Chart of Reviewed Article Review

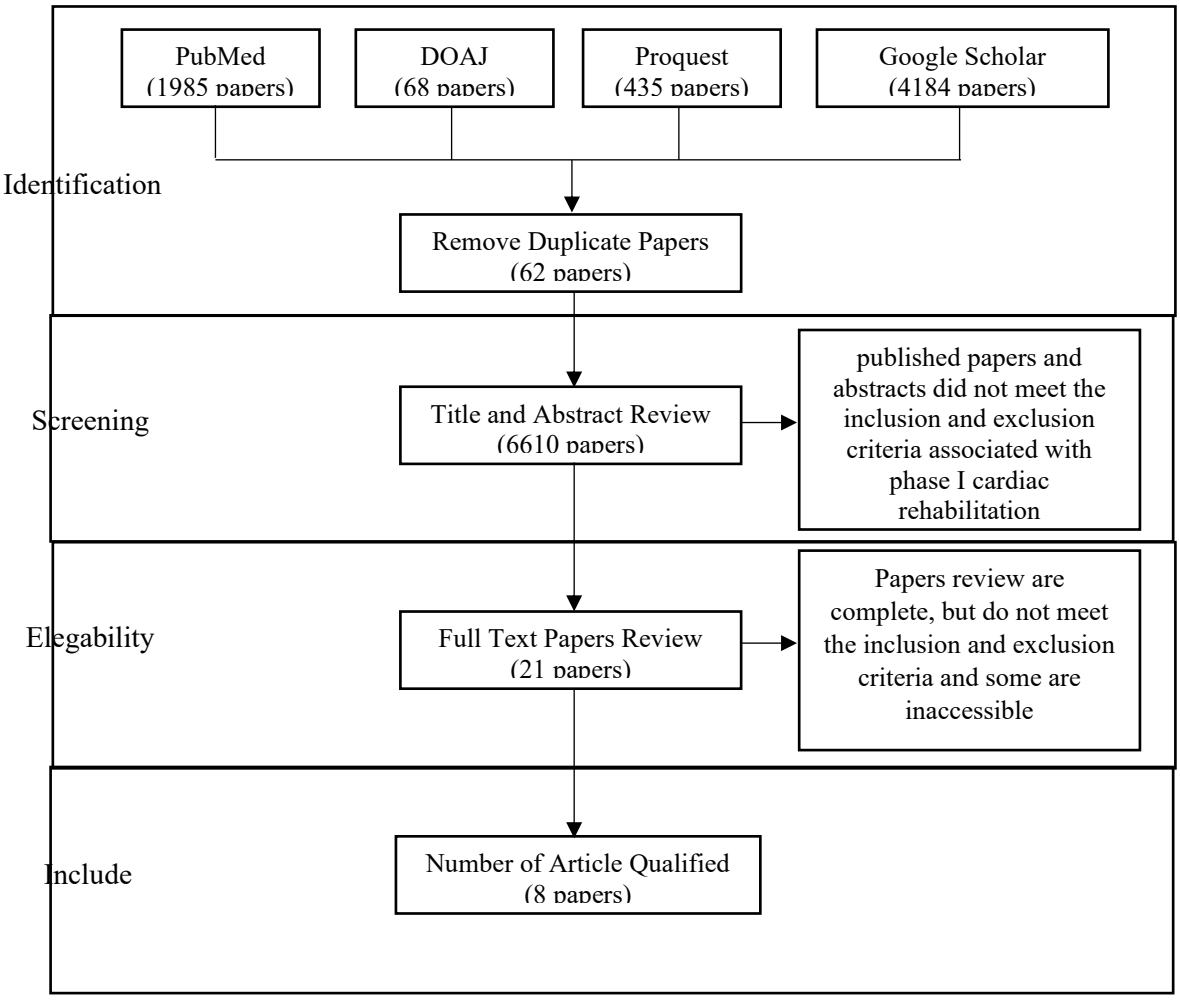

Table 1. Article Review Table

Article	Design	Sample	Intervention	Control	Outcome	Conclusion
Zang, et al.(2012) China	RCT	N=40 Random Sampling	Treatment according to standards and add education which includes; Effective abdominal breathing and coughing exercises and The rehabilitation program that will be carried out includes diet, nutrition, pharmacological therapy, teaching early mobilization in stages	The nurse in the room provides education about the treatment process that the patient will undergo and pain management, as well as the rehabilitation program that will be carried out.	Anxiety level	Anxiety that occurred in the intervention group was lower than the control group

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		Psychological counseling			
Julie Munro, et al. (2014) Arab	RCT	N= 50	The rehabilitation program for CHD patients uses 6MWT	Nurses in the Room provide phase 1, 2 and 3 programs by doing 6MWT, then monitoring using quality of live (QOL) on the control group	Quality of life improves	Show that cardiac rehabilitation programs can improve the quality of life of patients in society
Modi, et al.(2014) India	RCT	N=46	Phase I rehabilitation with additional training load using 6MWT	Cardiac Rehabilitation Phase I	*Six minute walk test (6MWT) and quality of life*	The control and intervention groups had significant results for products measured for both 6MWT and the QoL questionnaire results in the phase I rehabilitation program.
Borzou, et al. (2018) Iran	RCT	N=30 Random Sampling	Phase I cardiac rehabilitation program includes, among others; breathing exercises, range of montion (ROM), gradual activity, starting from in bed to walking slowly in the bed area.	Pharmacological treatments and therapy are routinely carried out in the room	Self-efficacy	There was a difference between the self-efficacy value assessment before the intervention and after the intervention at home and 1 month after undergoing home care.
Dong, et al.(2016) China	RCT	N=106 Random Sampling	Providing education about rehabilitation carried out by the patients in the ICU in the form of 6 steps including head up,	Providing education about rehabilitation program	Duration of use of mechanical ventilation, length of stay in the	The group that was given the intervention in the form of early rehabilitation which gave

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		repositioning from supination to the process of the patient sitting on the bed, sitting on a chair, gradually mobilizing beside the bed, which is done 2 times a day.	ICU and hospital	results significantly reduced the use of mechanical ventilation and the length of stay in the hospital compared to the control group.
Savci, et al.RCT (2011) Turki	N=43 Random Sampling	Perform Routine mobilizations such asmaintenance active exercise (ROM), chest physiotherapy and supplemented with inspiratory muscle exercises performed during treatment	Lung function, respiratory muscle strength, upper and lower limb muscles, quality of life, and anxiety	The group that did the breathing muscle exercises recovered faster than the control group
Ana Claudia F., et al. (2017) Portugis	RCT N= 65	Treatment in cardiac rehabilitation phase I for CHD to relieve anxiety and anxiety in patients is given education that includes Health education on CHD and rehabilitation phase I Promotion of psychosocial adjustment for post-CHD rehabilitation	Questionnaire *hospital anxiety and depression Scale* (HADS) and *brief illness perception questionnaire* (BIPQ)	Adaptive coping adjustment, stress reduction and anxiety	The short psychological intervention program administered to the control group during hospitalization had a proven positive effect on cardiac rehabilitation and prognosis
Klopper, et al., (2014) Afrika Selatan	RCT N=19 Random sampling	Physiotherapy treatment is a phase I cardiac rehabilitation program that includes education on treatment management and gradual exercise	Physiotherapy Itreatment and mobilization standards	Functional capacity	There was a significant increase in functional capacity between the intervention and control groups post-hospital measurements.

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DISCUSSION

This literature study consists of 8 articles that discuss the management of phase I cardiac rehabilitation in patients with heart disease. Each article has several different actions for phase I cardiac rehabilitation, but according to the cardiac rehabilitation program. The results of a literature review can be concluded that phase I cardiac rehabilitation measures in patients with heart disease include education, breathing exercises, psychology, and physical exercise (6MWT).

Education

Education given to patients in phase I includes providing information about the process of heart disease which includes signs and symptoms, risk factors, pain management, teaching and stimulating patients to be able to control blood pressure, measure pulse frequency, treatments to be performed, diet information, nutrition, drug therapy, mobilization in bed, physical activity training and a healthy lifestyle (Zang et al., 2012; Dong, et al., 2016; Borzou, et al., 2018).

Breathing Exercises

The articles under study performed breathing exercises taught to patients as pain management. Breathing exercises taught using the abdomen, purse lip breathing, and deep breathing are recommended for patients experiencing pain. besides breathing exercises can also increase the functional capacity of the lungs (Shakuri, et al., 2015). A similar study was also used by Sabrinho, Guirado, and Silva (2014) who provided deep breathing exercises, then long expiration and inspiration, which used the diaphragm muscle and combined with lower limb mobilization. The conclusion of this study is that breathing exercises given to patients with heart disease for phase I cardiac rehabilitation have a positive impact on patient pain management and reduce treatment costs.

Psychological

Psychology is a fundamental thing in humans that cannot be left behind, in the research of Zang, et al. (2012) said that education is a psychological counseling action that can reduce the patient's anxiety level and can improve the patient's quality of life (Ana Claudia F., et al. (2017).

Physical training

Physical exercises include gradual mobilization on the bed, muscle stretching exercises, muscle strength training, and moving places. This physical exercise can improve respiratory function, functional capacity, reduce stress and improve the patient's quality of life (Savci, et al. 2011; Shakuri, et al., 2015). Another article also states that physical exercise can have a positive impact in reducing the incidence of complications. The phase I rehabilitation program is carried out according to the patient's condition (Savci et el., 2011).

Phase I cardiac rehabilitation is a comprehensive measure that will have a positive impact in increasing patient output. Based on the results of the study, there were 5 articles that conducted research related to cardiac rehabilitation. One of them is research conducted in African countries regarding the implementation of the phase I cardiac rehabilitation program which takes action in the form of providing education related to the disease experienced, physical exercise which includes gradual mobilization to pedal training such as pedaling a bicycle, sitting in a chair, walking up to 6 MWT (Julie Munro, et al., 2014).

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The duration of phase I cardiac rehabilitation depends on the type of exercise provided, for example, breathing exercises are carried out for 10 minutes, physical exercises are carried out for 30 minutes every day, with physical exercises carried out with gradual mobilization, and walking exercises with 6 MWT are carried out 1 to 45 minutes gradually according to the patient's ability (Savci, et al., 2011; Klopper & Hanekom, 2014; Julie Munro, et al., 2014; Dong, et al., 2016).

CONCLUSION

Based on the results of a review of 8 articles that have been carried out on phase I cardiac rehabilitation in CHD patients. Phase I cardiac rehabilitation measures include psychological education and counseling, breathing exercises, and physical exercises. This phase I cardiac rehabilitation is expected to improve the patient's quality of life optimally. Therefore, the results of this literature review can serve as a basis in determining the standard of phase I cardiac rehabilitation programs in hospitals where patients with coronary heart disease are present.

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