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Benson's Relaxation for Fatigue Patient with Coronary Artery Disease

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Abstract. Fatigue is the major symptoms in patients with coronary artery disease, during recovery period after cardiac events and during cardiac rehabilitation. Benson's relaxation is one of relaxation as modalities therapy to reduce fatigue, however few studies related to this technique in planned intervention. This study was to measure the effectiveness of Benson's relaxation in fatigue of coronary artery disease patients during cardiac rehabilitation. It was a quasi-experimental pretest posttest control group design. This study included 29 respondents in Dr.M. Djamil Hospital were assigned to intervention group which receiving Benson's relaxation technique (n=15) and control group with routine care (n=14). Benson's relaxation technique was administered for 5 days 2 times a day, each 20 minutes to intervention group. Fatigue was measured using Maastricht Questionnaire (MQ). The result indicated significant reduction in mean of fatigue between intervention and control group (p value < 0,001). The study concluded that Benson's relaxation technique is an effective non-pharmacological intervention to reduce fatigue in coronary artery disease patients.

Keywords: Benson's relaxation; fatigue; coronary artery disease

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1. Introduction

Coronary artery disease (CAD) is one of cardiovascular disease that remains leading cause death and disability. Approximately 39% annual mortality rate due to CAD in UK (1). In Indonesia, prevalence of CAD approximately 1,5% which highest incidence in 65-74 years' age group. Health Research in 2013 have founded 1,2% prevalence of CAD in West Sumatera (2). There are four major symptoms in CAD patients, one of them is fatigue. Other symptoms are pain, dyspnea and palpitations. Fatigue is unpleasant feeling of inability to perform physical or intellectual efforts that resulting an alteration of performance and quality of life. It was complained during recovery period after cardiac events and during phase 2 cardiac rehabilitation (3). Approximately 72%, CAD patients experience fatigue in daily activities (4).

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In patient with post CABG, there are 41% experienced fatigue (5). The study was founded mean of fatigue in CAD patients with undergoing cardiac rehabilitation is 13 ± 8 (Multidimensional Fatigue Inventory/ MFI-20) (6). Others studies shown 20% of patients with CAD experienced fatigue before entering a rehabilitation program (7).

Others studies explained that the majority of patients still reported fatigue during the 4 months to 2 years post myocardial infarction (7). Puetz, Flowers & O'Connor's (2006) research on the effects of aerobic exercise on energy loss and fatigue. This study recommended advanced interventions for psychosocial that increase feelings of energy and reduce fatigue (8). Most studies have been focused on association factors related with fatigue in CAD patients. However only limited study focused on nursing interventions to reduce fatigue. One of modality therapy is a relaxation technique. Benson Relaxation is a relaxation response development by including elements of confidence, that affect the response of decreasing sympathetic nervous activity and increasing of parasympathetic nervous activity, decreasing of heart rate, blood pressure and oxygen consumption (9,10). Relaxation method also stimulates the secretion of endorphins that making the body becomes relaxed (11). During the relaxation, the body will be in balance and the muscles will relax. Activation of parasympathetic nervous reduced vasoconstriction and peripheral resistance, more blood flowed to the brain, muscles and skin (10,12).

Muscle oxidative metabolism works seamlessly with adequate oxygen supply, so it could improve the muscle reconditioning mechanism and reduced fatigue. Progressively during relaxation, the skeletal muscle relaxes and absences of muscle contractions will have stored energy for cellular processes. The resulting is physiologically recovery of the body possibly (10,12). Most of the study on effect Benson's Relaxation to reduce pain, anxiety, blood pressure and blood glucose level in patient with chronic illness (9, 17, 18). Common relaxation using in Dr. M.Djamil Hospital as non-pharmacological therapy was deep breathing, and these Benson's Relaxation was new variation of relaxation method that will used. Therefore, this study aims to evaluate the effect of Benson's Relaxation on fatigue in CAD patients. We examined the hypothesis "after five days of interventions, fatigue of CAD patients who have received Benson's Relaxation and routine care will be better than those only receiving routine care.

2. Research Methods

It was a quasi-experimental with pretest post-test design. This study compared two groups of CAD patients during cardiac rehabilitation, the intervention group receiving Benson's Relaxation and the control group only receiving routine care. Setting of this study in Dr.M.Djamil Hospital in Padang during April-May 2017. Sample size are 29 (15 in experimental group and 14 in control group). Sampling technique is convenient sampling methods. The inclusion criteria are:

1. Patients
2. diagnosed with coronary heart disease, stable angina pectoris and unstable, post myocardial infarction patients with Percutaneous Coronary Intervention (PCI), Coronary Artery Bypass Graft (CABG), Corangiography, thrombolytic or on medical treatment.
3. Undergoing phase 2 cardiac rehabilitation.
4. Patients with New York Heart Association (NYHA) score Functional Classifications I dan II.
5. Willing to be a respondent and sign an informed consent.

Benson relaxation intervention was administered for 5 days 2 times a day, each 20 minutes in the intervention group. Sample recruitment was held in hospital, and Benson's relaxation intervention was administered in patient house. It required the patients to sit or sleep in a comfortable position, close their eyes and relax all their muscles, breath through their nose, and focussed on the mind, say the word "healthy" quietly to themselves when the breath was out. After 20 minutes, the patients were instructed opening their eyes. The control group received routine care of hospital. Data collected using questionnaires characteristics of respondents, Depression Anxiety and Stress Scale (DASS) for depression, reliability test 0.91 for depression item, 0.84 for anxiety items, 0.90-0.48 for stress item and test validity -0.68 (11). Maastricht Questionnaire (MQ) was use for fatigue and reliability is $\alpha = 0,912$ (12).

This study was conducted in accordance with the human subject protection principles. Ethical approval was obtained from the research ethics committee of Nursing Faculty of University of Indonesia. A written informed consent was also obtained from the subject for partisipation in this study. It provided some information about the study such as the purpose, procedure, promised anonymity in the event of publication of the study results, the right to withdrawal during the study.

3. Result and Discussion

According to the study result some points of participants' characteristic were identified. Age is one of the risk factors of coronary heart disease. Mean of age in this study is 52.55 years, and 65.5% male. Ten of 29 respondents had BMI >25 kg/m² to 30 kg/m² included in the overweight category and one respondent had BMI >30 kg/m² which was obese. Approximately 51.7% of respondents had a NYHA score of functional class II and 55.2% of respondents had one comorbidity. The most frequent comorbidities are diabetes mellitus and hypertension. The mean of depression score is in the range of 4.37 - 7.22. The details as follow.

Table 1. Demographic Characteristics

Characteristics	No. (%)	Mean \pm SD
Total	29	
Age		52,55 \pm 10,432
Gender		
Male	19 (65.5)	
Female	10 (34,5)	

Score NYHA		
<i>FC I</i>	14 (48,3)	
<i>FC II</i>	15 (51,7)	
BMI		24,47 ± 3,67
Comorbidity		
<i>No comorbidity</i>	13 (44,8)	
<i>Have one comorbidity</i>	16 (55,2)	
Depression		5,79 ± 3,74

The result of Paired t-test showed mean difference of fatigue before and after the intervention in the control group is 1.57 (SD: 3,25, *p value* = 0,094) (*p value* < 0,05). Different things are found in coronary heart disease patients which intervention Benson's relaxation for 5 days (2 times a day for 20 minutes), the mean difference in fatigue before and after Benson's relaxation is 10.27 (SD: 4,891) and *p value* < 0,001 (*p value* < 0,05). This showed a significant decreased of fatigue in coronary heart disease patients which undergo phase II cardiac rehabilitation and Benson's relaxation. Further analysis of difference mean of fatigue between control group and intervention group showed mean difference is 8,69 (*p value* < 0,001). There is a significant mean difference of fatigue between the Benson's relaxation group and control group. It shows the effect of Benson's relaxation to reduce fatigue in CAD patients during cardiac rehabilitation. It showed in the table below.

Table 2. Differences Fatigue Before and After Relaxation Benson Intervention

Variabel	Mean	SD	SE	<i>p value</i>
Control Group				
<i>Pre test</i>	13,57	7,24	1,93	0.094
<i>Post test</i>	12,00	5,92	1,15	
Intervention Group				
<i>Pre test</i>	20,04	9,53	2,55	< 0,001
<i>Post test</i>	10,57	5,29	1,41	

Due to their impact on disability and quality of life, fatigue is critical important in CAD patients. The purpose of this study to assess effect of Benson's relaxation on fatigue in CAD patients during cardiac rehabilitation. The study result indicated that Benson's relaxation reduced fatigue in patient with CAD during cardiac rehabilitation.

In this study a significant difference was founded between two groups after Benson's relaxation intervention and routine care. Another study showed a significant decrease of fatigue in female patients post-PCI or CABG which 1 year stress management program (*p* < 0,001) (15). Fatigue in CAD patients related immune abnormalities. This involves a long process of inflammation due to a damaging the vascular endothelial involving inflammatory agents such as CRP, cytokines (TNF alpha, IL-1 and IL-6) and NK cells (16). Fatigue also associated with impairment of autonomic nervous system function and hypoactivity of hypothalamic-pituitary-adrenal axis (6).

Hypothalamic-pituitary-adrenal axis (HPA) is a complex consisting of hypothalamus, pituitary and adrenal glands that responsible in stress response by regulating cortisol secretion and autonomic nervous stimulation. In addition hypothalamic-pituitary-adrenal axis (HPA) system also plays a role in maintaining of the body, mood and emotion, storage and energy management. The hypoactivities of hypothalamic-pituitary-adrenal axis (HPA) decreased endorphins secretion irregularities cortisol production. Corticotropins secretion will be enhanced by hypothalamus, and eventually decreased immunity and fatigue (17,18). Neuroendocrine disorders, increased sympathetic nerve activities and Renin- Angiotensin- Aldosterone system will increase vasoconstriction and peripheral resistance, resulting in increased blood pressure and pulse rate. It affected blood supply (oxygen and nutrients) and associated with disorder of peripheral muscle oxidative metabolic resulting in fatigue (3).

Relaxation Benson works through antagonist mechanism of the fight/flight reaction which involves the autonomic nervous system (sympathetic and parasympathetic). During the relaxation response there is a decrease in sympathetic nerve activity and increased parasympathetic nerve activity, resulting in decreased heart rate, blood pressure and oxygen consumption. Besides an increase in parasympathetic nerve activity will result in vasodilation and decreased peripheral resistance. So, long as the relaxation increased blood flow to the brain, muscles and skin. The supply of oxygen to the muscle oxidative metabolism is adequate and no acidosis. Improved function of the autonomic nervous system during Benson's relaxation can decrease fatigue (12, 3, 19).

Benson's relaxation also suppressed the epinephrine and cortisol releasing, it will reduced stress and stimulated pituitary gland to secreted endorphins. Endorphin was associated with serotonin that affected hypothalamus, improved immune system and reduced stress. This showed that relaxation of Benson may decrease immune abnormalities and hypoactivity of hypothalamic-pituitary-adrenal axis, which improved neurotransmitter dysregulation and reduced fatigue (20, 10, 11).

Limitations in this study are the subjects were selected in one hospital in West Sumatera, the result related to this small, to localized sample cannot be generalized to other population. Therefore, replication of the study is recommended to follow a larger population and using audio/music (headset) during implementation of Benson's relaxation to provide quiet environment.

4. Conclusions

This study showed that Benson's relaxation can be used as one of nursing intervention and modalities therapy for fatigue in patients with coronary heart disease.

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6. Conflict of Interest

There is no conflict of interest in this research result.

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