

## **The Effect of *Dhikr* Therapy on the Cardiac Chest Pain of Acute Coronary Syndrome (ACS) Patients**

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Received: 27 September 2019

Revised: 2 August 2020

Accepted: 17 August 2020

### **ABSTRACT**

**Background:** Cardiac chest pain is a typical complaint experienced by patients with Acute Coronary Syndrome (ACS) in Emergency Departments (EDs). Pharmacological therapy is one major intervention used to reduce cardiac chest pain due to ACS. However, this therapy does not optimally and completely reduce cardiac chest pain; therefore, additional therapy is greatly required.

**Purpose:** This study aimed to examine the effect of *Dhikr* therapy as one of the additional therapies for the cardiac chest pain experienced by patients with ACS in EDs.

**Methods:** This quasi-experimental research was conducted using a pretest-posttest control group design. As many as 52 patients with ACS were recruited using a consecutive sampling technique and then equally divided into the intervention and control group. The intervention group received both pharmacological and *Dhikr* therapy approximately for 17 minutes, while the control group only received the pharmacological therapy based on the hospital's protocol. The Numeric Pain Rating Scale (NPRS) was used to measure the intensity of cardiac chest pain, and both paired and independent t-tests were utilized to analyze the data.

**Results:** The results showed that there was a significant difference in pain reduction in both groups ( $p=0.000$ ), although the decrease in the intervention group was higher than that in the control group. Furthermore, the pain reduction was significantly different between groups ( $p=0.021$ )

**Conclusion:** *Dhikr* combined with pharmacological therapy reduced the intensity of cardiac chest pain in ACS patients better than the use of pharmacological therapy alone. Therefore, this study recommends the combination of pharmacological and *Dhikr* therapy for patients with ACS.

**Keywords:** Acute Coronary Syndrome (ACS); cardiac chest pain; Emergency Departments (EDs); *Dhikr* therapy

**How to Cite:** Pangestika, D. D., Trisyani, Y., & Nuraeni, A. (2020). The effect of *Dhikr* therapy on the cardiac chest pain of acute coronary syndrome (ACS) patients. *Nurse Media Journal of Nursing, 10(2)*, 200-210. doi:10.14710/nmjn.v10i2.25638

**Permalink/DOI:** <https://doi.org/10.14710/nmjn.v10i2.25638>

## **BACKGROUND**

Ischemic Heart Disease (IHD) is the most common heart disease in the world. Research showed that the prevalence of Cardiovascular Disease (CVD) was approximately 422.7 million cases with 17.92 million deaths (Roth et al., 2017). Data from the Ministry of Health of the Republic of Indonesia (2018) reported that the prevalence of heart disease in Indonesia in 2015 rose by 15 per 1,000 people, or approximately 2,784,064 people; West Java has become the big 10 provinces with the highest number of people suffering from heart disease. In the Asia Pacific, Acute Coronary Syndrome (ACS) was the most common coronary heart disease with the prevalence of death reaching for more than 5% (Chan et al., 2016).

ACS is a heart disease with a typical symptom of cardiac chest pain. This cardiac chest pain is described as a symptom that is mostly complained by patients; the characteristics of the pain, include a sensation of being struck by a heavy object or burning sensation that spreads from chest, shoulders, and neck to arms, as well as breathing difficulty (Malik, Khan, Safdar, & Taseer, 2013). The pain occurs due to the imbalance of blood supply to the coronary arteries which require oxygen and nutrients in the myocardium. The imbalance of blood supply may be caused by the presence of plaque in the coronary arteries resulting in ischemia. Once ischemia occurs for more than 20 minutes, myocardial infarction may be resulted and lead to the decreasing cardiac output. To deal with these conditions, the heart will perform anaerobic metabolism and produce lactic acid which eventually results in cardiac chest pain (McCance, 2010).

The prolonged cardiac chest pain may physically and psychologically affect patients' conditions. The physical impact is associated with the instability of electrical activity caused by the failure of the heart to pump the blood (McCance, 2010), while the psychological impacts as reported by those suffering from cardiac chest pain include depression and anxiety (Kim et al., 2016; Meneghetti, Guidolin, Zimmermann, & Sfoggia, 2017). Thus, this life-threatening pain requires immediate treatment. Another study also explained that patients with constant anxiety might have more complications than those without anxiety. Thus, controlling anxiety in patients with ACS is greatly important to maintain their health (AbuRuz, 2018).

Cardiac chest pain management for patients with ACS is mostly conducted using the pharmacological therapy, such as nitroglycerin, Isosorbide Dinitrate (ISDN),  $\beta$ -blockers, calcium antagonists, and morphine (Association of Indonesian Cardiovascular Specialist, 2018). However, the implementation of pharmacological therapy may also result in some negative impacts, such as gastrointestinal problems (nausea, vomiting), respiratory depression, and hypoxia at high dosages (Mccarthy, Mullins, Sidhu, Schulman, & Mcevoy, 2016). Thus, ACS patients require a complementary intervention to optimally reduce their cardiac chest pain. A spiritual approach was selected since many patients suffering from heart disease considerably decide to get closer to God as their coping strategy (Herawati, Keliat, Waluyo, 2019). Furthermore, Abuatiq (2015) also explained that nurses in the area of critical care nursing only focused on improving the patients' physical conditions, such as oxygenation, perfusion, and nutrition rather than their spiritual needs.

One complementary therapy which might be used to reduce the cardiac chest pain is *Dhikr* therapy. Some studies have shown the effect of *Dhikr* therapy in the clinical setting (Nasiri, Fayazi, Ghaderi, Naseri, & Adarvishi, 2014; Sulistyawati, Probosuseno, & Setiyarini, 2019; Wahyuni, Soejoenoes, Putra, & Syukur, 2018). Sulistyawati et al. (2019) used *Dhikr* therapy to reduce anxiety in patients suffering from cancer. Wahyuni et al. (2018) claimed that *Dhikr* therapy reduced stress and depression on primigravida women, while Nasiri et.al. (2014) used *Dhikr* therapy for post-operative pain. The effect of *Dhikr* therapy to overcome cardiac chest pain in ACS patients is related to their psychological conditions. Anxiety, depression, and stress may increase the sympathetic nervous activity resulting in an increasing level of catecholamine, cortisol, and inflammatory mediators, which influenced the required oxygen (DeJongh, Birkeland, Brenner, 2015). *Dhikr* therapy is a form of relaxation that can be used to reduce sympathetic nervous system activity and increase the parasympathetic nervous system activity. Parasympathetic nerves may decrease oxygen consumption, respiration, pulse, and result in relaxation (O'Donnell & Glasgow, 2011). Many researchers have carried out studies related to the effect of *Dhikr* therapy on some clinical purposes; yet *Dhikr* therapy on cardiac chest pain is still rarely conducted.

## **PURPOSE**

This study aimed to investigate the effect of the pharmacological and *Dhikr* therapy on the intensity of cardiac chest pain of ACS patients in the EDs.

## **METHOD**

### **Research design and samples**

This quasi-experimental research used a pretest-posttest control group design. The population and samples of this study were patients with cardiac chest pain entering the ED of an Islamic hospital in Bandung, East Java. The total samples were 52 respondents equally divided into two groups: the control group and the intervention group. Respondents were divided evenly in which the intervention group was completed first, and then allocated the remaining to the control group. The inclusion criteria were ACS patients with cardiac chest pain, Muslim, and receiving pharmacological therapies such as anti-angina, analgesics, or beta-blockers. Meanwhile, the exclusion criteria were patients of post-open heart surgery and losing consciousness.

### **Research instrument and data collection**

This research used the Numeric Pain Rating Scale (NPRS) to measure the respondents' pain scale. The NPRS scale starts from 0-10 and the scale was reported verbally by the patients. NPRS had been tested for validity and reliability in the previous studies (Alghadir, Anwer, Iqbal, & Iqbal, 2018; Ferreira-Valente, Pais-Ribeiro, & Jensen, 2011). Construct validity showed that NPRS had a strong correlation with Visual Analogue Scale (VAS) at  $r=0.96$  (Ferreira-Valente et al., 2011), while the reliability test had been confirmed in knee-pain osteoarthritic patients with an intraclass correlation coefficient of 0.95 (0.93-0.96) (Alghadir et al., 2018).

This study was conducted in the ED of one Islamic hospital in Bandung in 2017. The data were collected in two weeks. Prior to the administration of pharmacological therapies according to the hospital protocol, the pain scores were measured as the pre-test. The

intervention group then obtained *Dhikr* therapy for 17 minutes, while the control group received standard care. *Dhikr* therapy was given through earphones which was connected with sound recorder. Respondents were asked to say *dhikr* sentences namely *Subhanalah, Alhamdulillah, Allahuakbar, La hawla wala kuwata illa billah* 33 times slowly. The pain scores then were re-measured as post-test 27 minutes after the medication administration. The procedures to collect data were described in Figure 1.

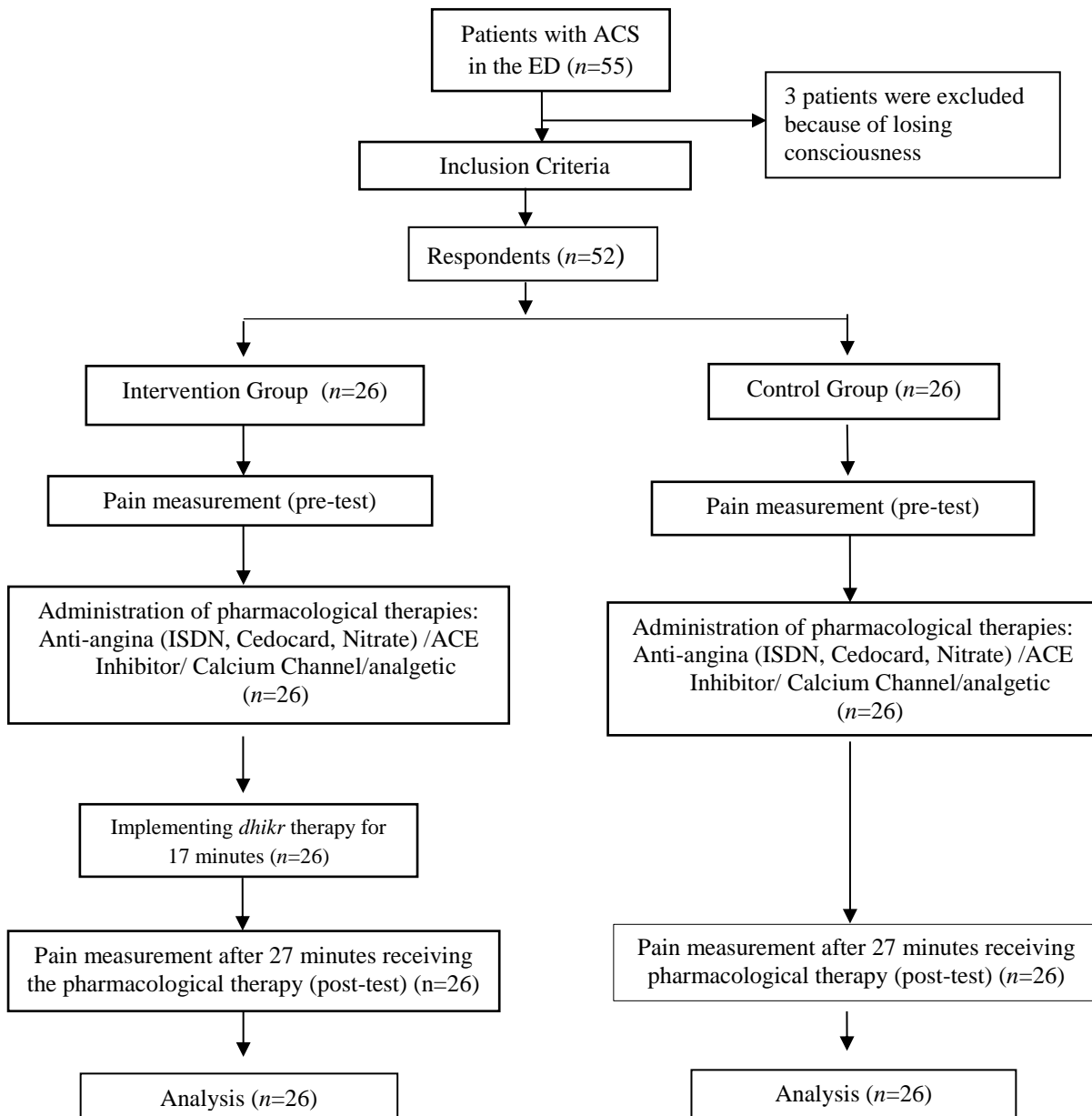


Figure 1. Patients' flow chart

### Data analysis

The data were analyzed using the dependent t-test to determine the mean difference score of cardiac chest pain experienced by each group before and after receiving the therapy. Before a further analysis with the dependent t-test, the data were tested for normality, and the result showed that the pain scores before and after the therapy were normally distributed. The hypothesis was examined using the independent t-test to determine the differences in pain reduction between the control and intervention groups.

### Ethical considerations

This research had obtained the ethical clearance from the Ethical Commission of Universitas Padjajaran (No. LB.04.01/A05/EC/057/III/2017). Some ethical principles were ensured in this study. All respondents were consented to participate in this research. Considering the principle of justice, after re-measuring cardiac chest pain in the control group, the control group patients also received Dhikr therapy for 17 minutes.

## RESULTS

### Characteristics of respondents

Table 1 showed the characteristics of respondents involved in this study. The dominant age in the intervention group was 57-67 years old (46.15%), while in the control group was 46-56 years old (46.15%). The majority of respondents in the intervention group suffered from Unstable Angina Pectoris (UAP) (38.5%) and mostly received nitroglycerin (65.4%). In contrast, STEMI/AMI was the most prominent disease in the control group (65.4%), and morphine was mostly given as the pharmacological therapy (38.5%). Furthermore, both groups were dominated by males. The homogeneity of respondents was tested to each characteristic, and the results showed that both groups were homogenous.

Table 1. Characteristics of respondents (n=52)

Characteristics	Intervention (n=26)		Control (n=26)		p
	f	%	f	%	
Age					
35-45	2	7.70	3	11.54	0.534
46-56	4	15.38	12	46.15	
57-67	12	46.15	6	23.08	
68-78	7	26.92	5	19.23	
>79	1	3.85	0	0	
Gender					
Female	9	34.62	7	26.92	0.343
Male	17	65.38	19	73.08	
Diagnosis					
STEMI/AMI	7	26.92	17	65.38	0.376
NSTEMI	9	34.62	9	34.62	
UAP	10	38.46	0	0	
Pharmacology					
Morphine	3	11.54	10	38.46	0.369
Nitroglycerin	17	65.38	7	26.92	

Characteristics	Intervention (n=26)		Control (n=26)		p
	f	%	f	%	
Beta-Blocker	3	11.54	5	19.23	
Anti-platelet	3	11.54	1	3.85	
ACE Inhibitor	0	0	2	7.69	
Calcium channel Blocker	0	0	1	3.85	

**Pain scale distribution**

Figure 2 shows the pain scale distribution before and after the treatment in the intervention and control group. The most striking feature was that the majority of respondents in the intervention group experienced a higher decrease of pain scales from scale 6 to 2 compared to the respondents in the control groups who experienced a decreased scale from 5 to 3.

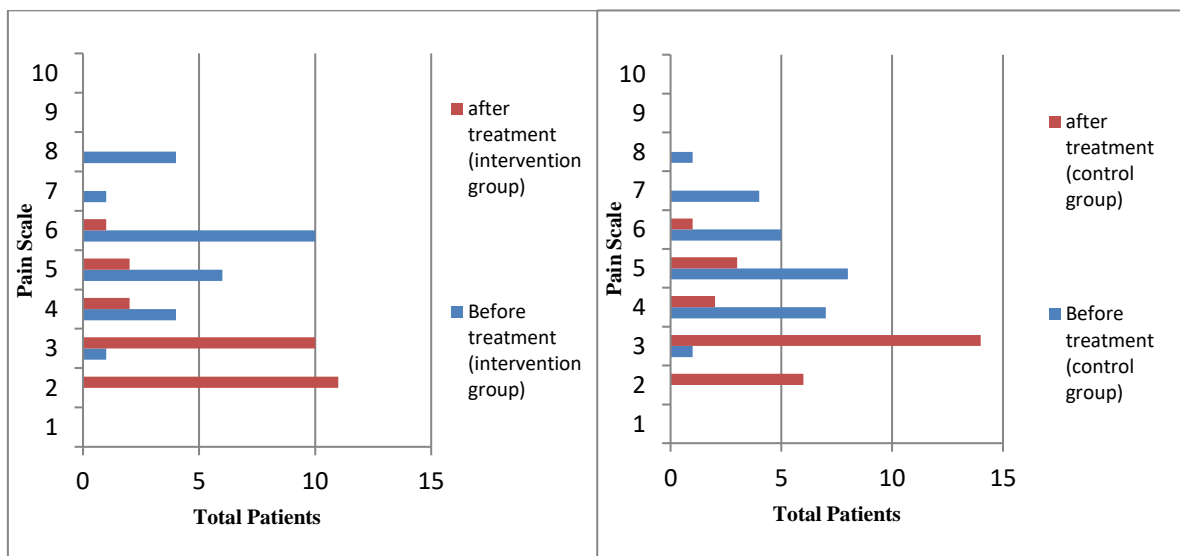


Figure 2. Pain scale distribution

**Cardiac chest pain differences**

Table 3 shows that the pre-test mean score in the intervention group was higher than that in the control group ( $5.73 \pm 1.54$  and  $5.27 \pm 1.25$ , respectively). Although both groups showed significant pain scale differences before and after the treatment ( $p=0.000$ ), the intervention group (2.77) had higher pain reduction than the control group (2.08). There was a significant difference in the pain reduction between the intervention and the control group ( $p=0.000$ ), indicating that *Dhikr* combined with pharmacological therapies decreased cardiac chest pain.

Table 2. Cardiac chest pain differences in the intervention and control group (n=52)

Cardiac chest pain	Mean	Min- Max	SD	p	CI 95%	MD	p
Intervention group							
Pre-test	5.73	3-8	1.54	0.000	(2.022) - (2.747)	2.77	
Post-test	3.35	2-6	1.79				
Control group							0.021
Pre-test	5.27	3-8	1.25	0.000	(1.776) - (2.378)	2.08	
Post-test	3.19	2-6	1.06				

MD=Mean differences

## DISCUSSION

The main result of this study showed that the combination of pharmacological and *Dhikr* therapy significantly reduced cardiac chest pain compared to the pharmacological therapy alone. This result is congruent with some previous studies. *Dhikr* therapy could reduce the pain experienced by patients after surgery (Haryani, Arifudin, & Nurhayati, 2015; Beiranvand, Noparast, Eslamizade, & Saeedikia, 2014), AMI patients (Nasiri et al., 2014), and primigravida women who experienced depression (Wahyuni et al., 2018). The decreasing pain scale is related to the patients' psychological conditions. Patients with ACS have anxiety symptoms, such as fear of death, losing personal control, and inability to normally work (Abu Ruz et al., 2010), leading to the production of catecholamine hormone causing hypertension, tachycardia, and shortness of breath that requires more oxygen (Smeltzer, Bare, Hinkle, & Cheever, 2010). One way to reduce anxiety and oxygen demand is *Dhikr* therapy. This is consistent with the research conducted by Sukarni, Mardiyono, & Parwati (2014), explaining that *Dhikr* therapy may reduce the anxiety of patients with ACS.

The effect of *Dhikr* therapy may be associated with the patients' relaxation. In this study, the patients received *Dhikr* therapy through an audio recorder for 17 minutes, and breathing slowly was aimed at relaxing and encouraging patients to concentrate well. Both pharmacological and *Dhikr* therapy simultaneously worked. Pharmacological therapy reduced the cardiac chest pain through an adequate function of endothelium which influences the bloodstream (Boden, Padala, Cabral, Buschmann, & Sidhu, 2015), leading to the increased oxygen supply and decreasing the oxygen demand, while *Dhikr* therapy may reduce the oxygen consumption by controlling some predictor factors, like anxiety and fear. However, it is interesting to note that both groups had significant pain decreasing after the therapies. This result might be caused by the fact that most patients in the control group received morphine as the main pain reliever. Theoretically, pharmacological therapy alone can reduce chest pain significantly. According to Wick (2016), morphine can reduce pulse, blood pressure, and venous return, leading to decreased demand for oxygen. On the other hand, the intervention group used a combination of pharmacological and *Dhikr* therapy which facilitated pain reduction more effectively.

The cardiac chest pain before the pharmacological therapy in both groups was dominated by moderate pain (4-6 scale). The number of patients suffering from the moderate pain was consistent with a study by O'Keefe-McCarthy, McGillion, Victor, Rizza, and

McFetridge-Durdle (2017), stating that 73 ACS patients were reported suffering from the moderate pain, 26 patients suffering from the severe pain, and 11 patients suffering from the mild pain. In contrast, Malik, et al. (2013) described that 84.9% of ACS patients were reported suffering severe pain, and 7.9% of patients suffering from mild pain. The intensity of pain may be influenced by several factors, such as age. This research found that most patients suffering from the cardiac chest pain were aged 57-67 years old in the intervention group, and 46-56 years old in the control group, due to the atherogenesis process in elderly people, such as endothelial injury, fat accumulation, and inflammatory response (atheroma formation). These processes may result in the presence of necrotic tissue and thrombus known as NSTEMI or STEMI (Dai, Busby-Whitehead, & Alexander, 2016). In addition, cardiac chest pain symptoms did not exist in elderly people that the death risk was higher than the other age group (Gale et al., 2012). The type of ACS may also influence pain intensity. In this research, STEMI was dominant in the control group. O'Keefe-McCarthy et al. (2017) stated that the increasing pain intensity in STEMI was caused by the production of fibrin which results in the blood vessel blockage. This condition may increase the patients' cardiac chest pain up to the severe pain level.

This study has a limitation that the ACS type and pharmacological therapy were not the same in both groups, which might affect pain reduction. In the intervention group, most patients suffered from UAP, while those in the control group suffered from AMI, the most dominant ACS type. The pharmacological therapy used in this study was also different. In the intervention group, nitroglycerin was used as the most dominant medicine, while morphine was mostly used in the control group. The pharmacological choices were based on the pain scale following the hospital's regulation. The morphine was used more in the control group and possibly highly decreased the pain scale. However, the intervention group had a higher mean pain reduction than the control group. Therefore, it can be concluded that the combination of pharmacological and *Dhikr* therapy is more effective to reduce the pain intensity of patients with ACS patients although most control group patients were given morphine.

## **CONCLUSION**

This study concluded that the combination of pharmacological and *Dhikr* therapy significantly reduced pain compared to pharmacological therapy alone. In clinical practice, *Dhikr* therapy can be considered as a complementary therapy to reduce chest pain in ACS, especially for Muslim patients. For further research, the characteristics of respondents especially the ACS and pain relief types should be controlled. Implementing *Dhikr* therapy to patients with ACS undergoing treatment in the Intensive Care Unit (ICU) may also become one alternative choice for the next research.

## **ACKNOWLEDGEMENT**

The researchers would like to show their appreciation to the Emergency Department of the Islamic Hospital which supported this study. We also thank the nurses and patients in ED who helped us to collect the data and participate in this project.

## **CONFLICT OF INTEREST**

The authors hereby state no conflict of interest in this research. The hospital did not have any control over the analysis or findings of the study.



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