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EFFECTS OF DHIKR ON SPIRITUALITY AND CORTISOL LEVELS AMONG PATIENTS WITH HEART FAILURE: A PILOT STUDY

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Research Report

A B S T R A C T

Introduction*:** *Depression and anxiety are common comorbid conditions in patients with heart failure (HF). Spirituality was found to have a positive impact on patients' mental health status. However, whether the spiritual practice affects physiological modulation is still questionable. Therefore, this study aimed to analyze the effect of dhikr as spiritual practice on spirituality and cortisol levels among patients with HF.* ***Methods*: A quasi-experiment was used in this study. A sample size of 18 respondents consists of 9 respondents of the control group and 9 respondents of the treatment group. Dhikr intervention was conducted in three meetings with an interval of two days during patients' hospitalization. Spirituality was measured using a spirituality questionnaire, whereas the cortisol levels with venous blood sampling, measured by the enzyme-linked fluorescent immunoassay (ELFA) method. Statistics analysis in this study was using t-Test for spirituality, Mann Whitney and Wilcoxon Sign Rank Test for cortisol level with a significance level of α<0.05.* ***Results****: The results showed that dhikr improves the spirituality of HF patients (p=0.000) and decreases the level of cortisol (p=0.015) significantly. Dhikr interventions appears to strengthen spirituality in patients with HF by improving stress perception which further modulates the adaptive stress response in the form of decreasing cortisol levels.* ***Conclusions****: Dhikr could be one of the spiritual nursing interventions to improve spirituality and stress hormonal modulation in patients with HF.*

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INTRODUCTION

Heart failure (HF) is a global burden disease that affects more than 26 million people worldwide (Savarese & Lund, 2017). The estimated prevalence of HF throughout Asia is 1.26% to 6.7% (Benjamin et al., 2017). Meanwhile, the prevalence of this disease in Indonesia based on having been diagnosed by a doctor is 0.13%, and based on symptoms is 0.3% (Research and Development Board Ministry of Health Republic of Indonesia, 2013).

Depression and anxiety are comorbids that are often experienced by HF patients (Aburuz, 2018; Aggelopoulou et al., 2017; Chapa et al., 2014). The prevalence of depressive events ranges from 23.8-67% in hospitalized patients and around 16.7-70% in outpatients (Chapa et al., 2014). Meanwhile, the prevalence of anxiety ranges from 11-70%. This prevalence is 4-5 times higher than in the general population (Aburuz, 2018).

Depressive and anxiety states cause HF patients to have a low self-acceptance response to illness. This results in a worsening disease prognosis, death, and a high incidence of readmission to the hospital (Smith, 2010; Song et al., 2009). In addition, depressed HF patients are at the highest risk of experiencing treatment nonadherence which causes a decrease in health status and is significantly associated with a higher mortality rate (Wu et al., 2013). Therefore, early detection and appropriate management of depression and anxiety is very important.

Dhikr is known to have a positive impact on peace of mind. Preliminary studies conducted on four HF patients showed that patients who practiced dhikr verbally, heart, and deeds at the same time were found to have better self-acceptance cognitive responses than patients who did not. Dhikr has been widely studied to reduce stress and depression in various populations, including the elderly (Suaib, 2011); kidney failure patients (Jauhari, 2014); lepers (Satiti, 2013); and healthy people (Matovani & Nashori, 2009; Hamid, Anwar, & Fasikhah, 2012). However, studies specifically on HF patients have never been carried out and the physiological mechanisms that occur are unknown.

Several studies confirmed that HF occurs due to excessive activation of the sympathetic system in the body (Rogers & Bush, 2015). Depressive states exacerbate the situation with additional activation of the neurohormonal complex (Chapa et al., 2014).

Depressed patients show increased activation of the neurohormonal system via hyperactivity of the hypothalamic-pituitary-adrenal (HPA) axis. The increased

activation causes the release of corticotropin-releasing factor (CRF). These factors signal the hypothalamic neurons and anterior pituitary gland to release corticotropin. Corticotropin stimulates the release of cortisol and aldosterone into the blood from the adrenal cortex. Increased serum cortisol levels lead to increased blood pressure and lipid profile, insulin resistance, abdominal obesity and inflammation. Meanwhile, increased aldosterone induces fluid reabsorption, sodium and potassium retention, and increases circulating blood volume so that blood pressure increases (Chapa et al., 2014; Thomas et al., 2008).

A number of neurophysiological changes are seen in various meditation and spiritual practices. Brain imaging studies suggest that intentional actions and tasks that require sustained attention are initiated by activity in the prefrontal cortex (PFC) and anterior cingulate cortex. In addition, brain imaging studies have also demonstrated an increase in thalamic activation mediated by the excitatory neurotransmitter glutamate which may be comparable to activity in the PFC. The dopaminergic system via the basal ganglia is believed to be involved in the regulation of the glutamate system and the interactions between the PFC and these subcortical structures (Newberg, 2011).

Because practices such as meditation and prayer require intense focus of attention, it is hoped that dhikr activities will also show activation of the same brain areas. Based on this description, it is needed to further examining the effect of dhikr as a meditation practice carried out by Muslims in the context of psychoneuroimmunology. The purpose of this study was to determine the effect of dhikr on the spirituality and cortisol levels in HF patients.

MATERIALS AND METHODS

This research used a quasi-experiment with pre post-test control group design. Sampling was carried out using a consecutive sampling technique from April to June 2016 at a local government hospital in East Java. The required sample size is based on the sample size formula of 9 respondents in each group (control and treatment). The inclusion criteria in this study included: 1) patients with NYHA functional class III-IV, 2) Muslim, 3) at least 36 years old, 4) able to communicate in Javanese or Indonesian. Patients were excluded from the study if they experienced a critical condition and needed intensive care, died, were forced home, and/or experienced psychiatric disorders, and withdrew before the study ended.

The intervention given in this study was dhikr, both orally, in heart, and in deeds for at least 3 days of treatment. The control group received standard care and booklet about dhikr intervention after the measurements were completed. The sentences uttered during verbal and heart dhikr are astaghfirullahal'adzim, subhanallah walhamdulillah wa laa ilaaha illallahu allahu akbar, and laa haula wa laa quwwata illa billah which are pronounced 100 times, 33 times, and 10 times respectively, with the aim of remembering and get closer to Allah SWT.

The variables measured are spirituality and cortisol levels. Spirituality was measured using a modified spiritual response questionnaire made by Nursalam (2015) with an internal validity of 0.636-0.893 and Cronbach's alpha of 0.914. While cortisol levels were taken through a vein as much as 3 cc at 07.00-08.00 a.m. This hormone was measured using the enzyme-linked fluorescent immunoassay (ELFA) method.

The analysis used descriptive and inferential statistics. Descriptive analysis used the mean and standard deviation (SD), while inferential analysis used the t-test if the data were normally distributed and the Mann Whitney and Wilcoxon Sign Rank Tests for data that were not normally distributed with a significance level of $\alpha < 0.05$. The data normality was tested using Saphiro-Wilk. Spirituality was normally distributed whereas the cortisol level was not. This research has received ethical approval from the Health Research Ethics Commission of the Faculty of Nursing, Airlangga University.

RESULTS

The total initial sample obtained in this study was 24 respondents. However, as many as 6 respondents were dropped out because two people were forced home, one person died, one person refused after the first sampling, and 2 people underwent over-patient care. So that the total sample obtained until the end of the study was 18 respondents with a distribution of 9 respondents in each group (control and treatment).

Table 1. Characteristics of respondents

Characteristics	Control (n=9)		Intervention (n=9)		p-value
	f	%	f	%	
Ages (years)					
36 – 40	1	11.1	2	22.2	0.311
41 – 60	4	44.4	5	55.6	
61 – 70	4	44.4	2	22.2	
Gender					
Mal¬e	5	55.6	5	55.6	1.000
Female	4	44.4	4	44.4	

Characteristics	Control (n=9)		Intervention (n=9)		p-value
	f	%	f	%	
Marital status					
Married	5	55.6	9	100	0.082
Widow/widower	4	44.4	-	-	
Education					
Elementary school	5	55.6	6	66.7	
Junior high school	1	11.1	1	11.1	0.610
Senior high school	3	33.3	2	22.2	
Occupation					
Employed	4	44.4	3	33.3	1.000
Unemployed	5	55.6	6	66.7	
NYHA class					
III	5	55.6	5	55.6	1.000
IV	4	44.4	4	44.4	
History of admission to hospital					
Once	6	66.7	5	55.6	
Twice	3	33.3	1	11.1	0.362
> 2 times	-	0	3	33.3	

Table 1. shows the characteristics of the research respondents. Most of the patients were male (55.6%) with a mean age of 53.6 (SD 10.7). Most of the respondents married, passed the elementary school, and unemployed. More than half of the respondents had NYHA III functional class (55.6%), and were admitted to the hospital for the first time. All characteristics of the respondents showed no difference between the control and treatment groups (homogeneous).

Table 2. Variable of spirituality and cortisol levels

Variables Spirituality	Category	Pre-test	Post-test	p-value
Control	Mean±SD	13.00±3.84	15.33± 3.00	p=0.156a
	Min.	7	10	
	Max.	19	19	
Intervention	Mean±SD	14.22± 4.80	24.44± 2.128	p=0.000a
	Min.	6	20	
	Max.	22	27	
		p=0.559b	p=0.000b	
Cortisol levels				
Control	Mean±SD	123.15± 43.06	168.23± 122.17	p=0.230a
	Min.	31.34	51.10	
	Max.	172.87	390.64	
Intervention	Mean± SD	193.28± 174.85	125.08± 61.39	p=0.015c
	Min.	94.07	59.01	
	Max.	650.0	253.52	
		p=0.453d	p=0.358b	

a: Paired t-Test
b: Independent t-Test
c: Wilcoxon Sign Rank Test
d: Mann Whitney Test

Table 2. shows that there was no difference in spirituality and cortisol levels in the control and intervention groups before the intervention was given with p values of 0.559 and 0.453 respectively. After giving the dhikr intervention, the intervention group showed significant differences, where the value of p=0.000 for spirituality and p=0.015 for cortisol level, whereas the control group had no significant differences. It showed that dhikr had an effect on improving spirituality and cortisol levels in patients who received dhikr intervention.

DISCUSSION

This study showed that dhikr intervention improved spirituality and cortisol level among patients with HF. The significant increase in spirituality in the intervention group in this study was in accordance with the research of Satiti (2013) who used a modified Cognitive Behavioral Stress Management (CBSM) – Asmaul Husna remembrance intervention to form positive perceptions of leprosy sufferers. In addition, this was also consistent with the results of research showing that frequent-spiritual mantram repetition increases spiritual belief and connectedness, meaningfulness of life, and emotional improvement. Types of emotions that significantly show improvement include stress, anxiety, and anger (Bormann, 2005).

Dhikr (oral, heart, and deeds) in this study functions as a stressor that influences individual learning processes. Oral remembrance provides a sound stimulus that is captured by the sense of hearing to be forwarded to the temporal lobe which is then captured by the God spot (circuit of God). Stimulus on the God spot is sent to the prefrontal cortex which is strengthened by heart remembrance to carry out the learning process to form positive perceptions, both emotionally and spiritually. Recitation of the heart is intended to strengthen the memory that has been formed previously in the brain. Brain imaging studies suggest that intentional actions and tasks that require constant attention are initiated by activity in the prefrontal cortex (PFC) and anterior cingulate cortex (Newberg, 2011). Since the practice of dhikr requires intense focus of attention, it activates the same areas of the brain. The increase in cognitive response is also strengthened by deeds remembrance as a manifestation of oral and heart remembrance. The increase in those cognitive response reflected the improvement of spirituality of HF patients.

The results of the analysis of measuring cortisol levels in the intervention group after being given the dhikr intervention showed a significant decrease compared to the control group. This was in accordance with Satiti's study (2013) which showed a decrease in cortisol levels in distress leprosy patients who received Cognitive Behavioral Stress Management (CBSM) modification intervention – Asmaul Husna's remembrance. In HF patients who received treatment, the dhikr intervention acts as a stimulus that influences the formation of stress perception and stress response.

Stress perception as indicated by an increase in the spirituality score of the intervention group also influences the formation of a positive stress response. The stress response is in the form of physiological or biological changes by the decrease in cortisol levels. Positive cognitive responses are sent by the amygdala as feedback to the hippocampus. Furthermore, the amygdala stimulates the hypothalamus via the hypothalamic-pituitary-adrenal (HPA) axis to decrease CRF expenditure (Newberg, 2011). The decrease in CRF levels will stimulate the anterior pituitary to lower ACTH levels so that cortisol released into the bloodstream is under control.

CONCLUSIONS

There is an effect of dhikr on increasing spirituality and decreasing cortisol levels in HF patients. Dhikr increases the patient's spirituality through the formation of the right stress perception so as to produce a good stress response in the form of decreased cortisol levels. The use of dhikr interventions in HF patients can be recommended to reduce stress levels and for further research needs a study with a more robust design and a larger number of samples.

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