

## THE EFFECT OF HOME BASED EXERCISE TRAINING TOWARD THE ANXIETY LEVELS OF CONGESTIVE HEART FAILURE PATIENTS IN BORNEO HOSPITAL

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### ABSTRACT

**Background:** Congestive heart failure is a chronic disease; the condition causes a person feel anxiety. Anxiety occurs because the patients know their heart's function does not work properly, so they feel that it threatened to health, fear of death, and disability. One of the interventions to patient in order to reduce the anxiety is through home based exercise training (HBET). **Objective:** This study aimed to analyze the effect of HBET toward the anxiety level of congestive heart failure patients. **Methodology:** The design of this study was quasi experiment pre-post without control group. The sampling collection technique was consecutive sampling and there were 26 respondents. Place of the research was in Dr. Soedarso Hospital, Pontianak, West Kalimantan. The collection data of Anxiety level used HRS-A questionnaire. The paired t test was used to analyze the data. **Result:** The research result showed that there decreased of anxiety score before and after intervention with average score of 8.62 and (p-value 0.000). **Conclusion:** Based on the results of the study, there was HBET influence toward the anxiety level of patients of congestive heart failure. HBET may used as one of the interventions to reduce the anxiety of congestive heart failure patients, especially for post-hospital care patients.

**KEYWORD:** congestive heart failure, home based exercise training (HBET), level of anxiety.

### INTRODUCTION

Congestive heart failure is a pathological condition when heart loses the ability to pump adequate blood to meet the metabolic needs of the body (Black & Hawks, 2014). Congestive heart failure is one of disorders in the cardiovascular system, which the incident has consistently improved. WHO (World Health Organization) reports, 17.5 million people around the world died each year by cardiovascular disease, and more than 75% of the deaths occur in low- and middle-income countries (WHO, 2016). Based on data from American Heart Association (AHA), the prevalence of heart failure in the United States increased from 5.7 million people in 2009 to 6.5 million people in 2012 (AHA, 2017).

The prevalence of heart failure in Indonesia is 0.3% or approximately 530,068 people. The prevalence data is

determined based on interviews to respondents aged 15 years and over; the focus are the combined of disease cases that ever diagnosed by doctors and cases that have symptoms of heart failure. Meanwhile, the prevalence of heart failure in West Kalimantan (Kalbar) province is 0.08% (Riskseddas, 2013).

Smeltzer (2013) explain, the heart failure may have impact to biopsychosocial, for both the patients and family of patients. Heart failure is a chronic disease; where the patients of heart failure tend to have asthma conditions because there is disorder in the diffusion process that is disorder of exchange between O<sub>2</sub> and CO<sub>2</sub> in the pulmonary alveolus, then the patient tend to have asthma, anxiety, and worried. Anxiety occurs because the patients know their heart's function does not work properly, so they feel that it threatened to health, fear of death, and disability. Excessive anxiety affects the changes at patient behavior, with manifestations such

as nightmares, insomnia, denial from reality, depression or anxiety (Black & Hawks, 2014). According to Stuart (2013), Anxiety can affect a person's physical state, self-perception and relationships with others. This makes anxiety a basic concept in nursing science.

This case is supported by study entitled "Anxiety Level Relation with Coping Mechanism at Congestive Heart Failure Patients in Irina F Blu RSUP. Dr. R. D. Kandou Manado". The results reported, from 30 samples, the respondents who experience anxiety with the incident proportion score is 56.7% (Ransun et al, 2013). The heart rehabilitation program is one of self-defense mechanisms to overcome the anxiety (Smeltzer, 2013). Radi, Joesoef and Kusmana (2009) explains, there are four cardiac rehabilitations phases including phase I which is the phase of treatment during hospitalization, phase II is done immediately after the patient is discharged from the hospital. Physical exercises in this phase should be performed at facilities that provide continuous EKG (*Electrocardiograf*), emergency equipment and medical supervision of physical exercise. While phase III and IV is cardiac rehabilitation program that can be done at home. Heart rehabilitation that can be done at home is also called home based exercise training (HBET). The rehabilitation activities include walking, jogging, weight training, and recreational games (Black & Hawks, 2014). According to Stuart (2013), motivating the patients to perform activities can increase the functional capacity of a person and is part of the implementation of nursing to reduce the anxiety.

Based on the results of literature review, Chien et al (2008) describes, the physical exercises that may do at home by patients with chronic heart failure are walking and cycling for 20-60 minutes, the frequency of the physical exercises is 2-5 times per week with 40-70% intensity of heart rate maximum and NYHA functionality of class I-III. Adsett & Mullins (2010) in his book Evidence Based Guidelines for Exercise and Chronic Heart Failure explains that the time taken for heart failure patients to exercise, exercise begins with a short duration (10-20 minutes) and is enhanced by increasingly longer sessions (30-40) minutes. Suharsono (2013) explain, most of the research on physical exercises, the physical exercises are conducted within a period of 4 weeks to a year (most often for 8 to 12 weeks). Although, there is no formula for certain time, frequency, and duration, but the formula of 4, 8 to 12 weeks have a positive and safe effect to heart failure patients according to some scientific journals.

HBET may become one of the alternatives as post-treatment modalities of patients treated from hospital due to the cost are also cheap and there is family's monitoring. HBET should be an integral part of management of heart failure after exit from hospital (Suharsono, 2013). The purpose of this study was to identify the effect of HBET toward the anxiety level of

patients with congestive heart failure in Dr. Soedarso Hospital, Pontianak, West Kalimantan Province.

## RESEARCH METHODS

The particular study used quasi experimental design with pre-post without control group. The population of the study was the outpatient patients of congestive heart failure at Dr. Soedarso Hospital, Pontianak, West Kalimantan Province. The sampling collection technique is consecutive sampling. The intervention that conducted to patients was home based exercise training; 1) 25-minutes walk which begins with 5 minute-warming up and ends with 5 minutes- cooling down, 2) the frequency is 2 times in a week for one month and may be changed based on the patients' condition, and 3) with intensity of low-moderate exercise.

The functional capacity of heart rate reserve with Karvonen's formula is often used to calculate the intensity of exercise training. Low intensity-moderate intensity (40-70%) used to perform exercise training in patients with congestive heart failure. The formula's that can be used are  $[(\text{maximal heart rate} - \text{resting heart rate}) \times \text{exercise intensity (40-70\%)}] + \text{resting heart rate}$  (Myers, 2008; Piotrowicz et al, 2015). Maximum Heart Rate can be predicted with a 220 - age formula in years (AHA, 2015). The collection data of Anxiety level used HRS-A questionnaire that measured before and after the intervention.

Data analysis of the study used descriptive analysis for analysis of general data of respondents and the results of assessment before and after HBET. Meanwhile, paired t test used to determine the effect of HBET toward the anxiety of patients with congestive heart failure, and Shapiro-Wilk with score  $> 0.05$  was used to test the normality of data.

## RESULTS

### Univariat analysis

The results of the study were analyzed using data analysis software. The univariate analysis in the form of the frequency distribution of the characteristics of the research respondents can be seen in Table 1 below. The results of the study were obtained as follows:

**Table 1. General characteristic of respondents (n=26).**

Variable	n=26	
	f	%
<b>Age</b>		
34-36 year (end of adult)	3	11,5
46-55 year (early of elderly)	8	30,8
56-65 year (end of elderly)	11	42,3
> 65 year (elderly/ old)	4	15,4
<b>Gender</b>		
Male	13	50
Female	13	50
<b>Education</b>		
Elementary School	12	46,2
Junior high school	5	19,2
Senior high school	8	30,8
Higher education (college)	1	3,8
<b>Occupation</b>		
Civil servant	1	3,9
Entrepreneur	9	34,6
Pension	2	7,7
Others (house wife, doesn't work)	14	53,8
<b>Classification and functionality of NYHA</b>		
Class I	19	73,1
Class II	7	26,9
<b>Total</b>	36	100

Based on Table 1, obtained data: End of elderly group (56-65) years (11 people or 42.3%) are the most of the distribution of respondents' age, the gender distribution of the respondents, both male and female, is 13 people or 50%, most of the education distribution of respondent is elementary school (12 people or 46,2%), most of the profession distribution of the respondent is other group (14 people or 53.8%), and most of the NYHA classification and functional distribution is class I group (19 people or 73.1%).

**Table 2. Score of anxiety level before HBET intervention (n=26).**

Variable	Mean	Median	SD	Min-Max	95% CI
Anxiety Score	30,81	29,50	±7,36	19-44	27,83-33,78

Based on Table 2, Mean before HBET intervention is 30.81, median 29.50 and deviation standard is 7.36. The results of the analysis also showed that within 95% confidence range (95% CI) it is believed the respondent's average for anxiety score before HBET intervention with range is 27.83 to 33.78. This study shows that the respondents generally have a high level of anxiety.

**Table 3. Score of anxiety level after HBET intervention (n=26).**

Variable	Mean	Median	SD	Min-Max	95% CI
Anxiety Score	22,19	22,00	±6,46	14-36	19,58-24,80

Based on Table 3, Mean after HBET intervention is 22.19, median 22.00 and deviation standard is 6.46. The analysis results also show that in 95% confidence range (95% CI) it is believed the respondent's average anxiety score after HBET intervention is 19.58 to 24.80. The score is based on the range of anxiety scores, it showed that respondents generally have medium to low of anxiety levels, so there decreased of anxiety levels before and after the intervention from high anxiety to medium and low of anxiety level.

**Table 4. The Differences of anxiety score before and after HBET intervention (n=26).**

Variable	Mean	Median	SD	Min-Max	95% CI
Differences of Anxiety score	8,62	10,00	±2,54	3,0 – 12,0	7,59-9,64

Based on data analysis results, the average of anxiety score differences is 8.62. The results of the study showed the differences of anxiety scores of respondents before and after HBET intervention is in the range of 7.59 - 9.64.

### Bivariate Analysis

Analysis of HBET influences on anxiety, can be seen in Table 5 below.

**Table 5: Analysis of HBET influences on anxiety score (n=26).**

Variable	Mean	SD	SE	P Value	n
Anxiety score before	30,81	7,36	1,44	0,000	26
Anxiety score after	22,19	6,46	1,27		

### Where:

\* $P < 0.05$  between pre and post

The average anxiety score before HBET intervention is 30.81 with deviation standard is 7.36. The mean anxiety score after HBET intervention is 22.19 with a deviation standard is 6.46. The results of the analysis data showed that the mean anxiety score before and after HBET intervention decreased with 8.62 score. Based on the analysis results, obtained p Value = 0.000, which means there is a significant differences on anxiety score of respondents before and after the HBET intervention.

## DISCUSSION

Anxiety is emotional states and subjective experiences as well as individual emotional responses, which are judgments due to uncertain fears accompanied by feelings of uncertainty, disability, isolation and insecurity usually caused by physical or psychological exposure of threatening situations (Stuart, 2013). Patients with heart problems when an attack presents a stressful condition, this can cause anxiety patient. The anxiety because of death threats, threats to self-concept, stress, changes in health status, and care environment.

The results of the study indicate the influence of HBET toward the anxiety level of congestive heart failure patients. The decreasing of anxiety score on the respondents means, there are improvement of the patients psychological response toward the change of the health status. Many of heart failure patients experience the anxiety and the levels of anxiety are high, medium, and low (Ransun, 2013).

Kusl (2002) conducted a study on the effects of phase 1 cardiac rehabilitation toward the anxiety of 70 CABG (coronary artery bypass graft) patients at ICCU in a hospital of Taiwan. The intervention is, teaching the patients to perform activities gradually. The results showed that the application of phase I heart rehabilitation program has decreased the anxiety level of CABG patients significantly with  $p$ -value  $<0.05$ .

This analysis results also support the previous study conducted by Jolly et al (2009), found a significant decreasing in the anxiety level of congestive heart failure patients after following cardiac rehabilitation program in the intervention group compare to the control group. Lavie et al (2007), in the research entitled "Psychological Factors and Cardiac Risk and Impact of Exercise Training Programs-A Review of Ochsner Studies", found a significant decreasing in the anxiety level after following cardiac rehabilitation program with  $p$  Value = 0.001.

Mertha (2010) states that the physical activity gradually reduce the anxiety levels of the treated patients with PJK by  $p$  Value = 0.001. Suryanto (2011) states, the regular physical exercise make person more resistant to stress. During the physical exercise, the pituitary gland increases the endorphin hormone production. Endorphin is one type of natural hormone that triggers pleasure and relax. As a result, the hormone concentration migrates to the blood and transports to the brain, so it reduces the response of pain, anxiety, depression, and fatigue.

Stuart (2013) describes the physical exercise that performs in relax may reduce the muscle tension and anxiety. The analysis is the muscle tension associated with the anxiety; if the muscle tensions more relaxes, and then the anxiety will reduce. Relax conditions will block the stimuli transfer of threat from the brain to the sympathetic nervous branches from the autonomic

nerves to the adrenal gland, thus the release of the epinephrine hormone will be blocked and lead to be more relaxed breathing, the heart beats is not too fast, and the arterial pressure does not increase.

The results of the study support the concept that exercise activity is one component of cardiac rehabilitation programs and basic needs of human, if carried out regularly it may improve the biopsychosocial and spiritual health of the patient (Potter & Perry, 2010). This is because the cardiac rehabilitation conducted by the patient can eliminate the fear of death, so it also reduces the anxiety and improves the patients' feelings of health especially after following the exercise activity (Mertha, 2010).

Heart failure is associated with an inability to adapt to muscle structure and function, revealed that light weight training is effective to increase the muscle mass and strength and tolerance limit for exercise of heart failure patient (Christy, 2013). Rismayanthi (2008) describes, the heart adapts to exercise that is conducted regularly with adequate intensity and duration by increasing the strength and efficiency, so the heart can pump more blood per pulse. In addition, exercise also make calm the nervous system, this reduce the output number of adrenaline and other hormones that cause stress, which make blood vessels to shrink and raise the blood pressure.

The concept of nursing theory that appropriate to this research is adaptation theory by Calista Roy. According to adaptation concept model by Roy, human beings is an open adaptation system and always obtain stimulus input to perform the process of control and providing response, both adaptive and maladaptive (Alligood, 2014). The researchers concluded that adaptation concept by Roy could be integrated into this study; patients receive stimuli of focal, contextual or residual before the patient have congestive heart failure. The most common of focal stimulus in congestive heart failure cases are the coronary arteries to shrink. Contextual stimulus such as sex and age can increase the risk case. Furthermore, the residual stimuli are smoking habit, high cholesterol, unhealthy diet, lack of exercise, and obesity.

These stimuli cause a person to experience the congestive heart failure, and resulting in complaints of health threats, fear of death, and disability. The factors can make person to experience the anxiety (Smeltzer, 2013). Therefore, it needs to control the process, and then the mechanism of coping becomes adaptive. One of the control processes is home based exercise training or physical exercise at home. According to Stuart (2013), regular physical exercise can increase the endorphin hormone production and block the release of the hormone epinephrine, and then patient feels more relaxed and calm and reduce the anxiety. Suharsono (2013) stated that HBET increase the functional capacity

of heart failure patients, so it increases the self-confidence.

## CONCLUSION

Based on the research results and discussion, it concluded: this study has identified the characteristics of age, gender, education, profession, and classification and functional of NYHA. The average age of the respondents was in the end of elderly group, the youngest age is 38 years and the oldest is 70 years. The number of gender between male and female are in the equal, 13 people. Most of the respondents' education is elementary school, and most of the classification and functional of NYHA is in class I.

Statistical results of HBET affect to the anxiety level of heart failure patients in Dr. Soedarso Hospital, Pontianak obtained p Value  $0.000 < \alpha (0.05)$ , so it concluded that there was an influence Home based exercise training (HBET) Toward the anxiety level of congestive heart failure patients. Parish, Kosma & Welsch (2007), the goal of exercise training in patients with heart failure is to reduce the morbidity of the disease and to maintain the functional capacity to live independently in life.

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## REFERENCES

- Adsett, J., & Mullins, R. (2010). *Evidence based guidelines for exercise and chronic heart failure*. Queensland.
- Alligood, Martha Raile. (2014). *Nursing theorist and their work*. 8<sup>th</sup>. Ed. St. Louis: Mosby Elsevier, Inc.
- American Heart Association. (2017). *AHA Statistical Update, Heart Disease and Stroke Statistics-2017 Update*.  
<http://circ.ahajournals.org/content/early/2017/01/25/CIR.00000000000000485>
- American Heart Association. (2015). *Target Heart Rates*.  
[http://www.heart.org/HEARTORG/HealthyLiving/PhysicalActivity/Target-Heart-Rates\\_UCM\\_434341\\_Article.jsp#.WozZPrOyTIU](http://www.heart.org/HEARTORG/HealthyLiving/PhysicalActivity/Target-Heart-Rates_UCM_434341_Article.jsp#.WozZPrOyTIU)
- Black, J. M., & Hawks, J. H. (2014). *Keperawatan medikal bedah: manajemen klinis untuk hasil yang di harapkan* Edisi-8 Buku 2.
- Chien, C. L., Lee, C. M., Wu, Y. W., Chen, T. A., & Wu, Y. T. *Home-based exercise increases exercise capacity but not quality of life in people with chronic heart failure: a systematic review*. Australian Journal of Physiotherapy, 2008; 54(2): 87-93.
- Christy, B. *Referat Latihan untuk Gagal Jantung*. SMF Ilmu Penyakit Dalam. Universitas Jember, 2013.
- Hwang R., Redfern J., & Alison J. *A Narrative review on home based exercise training for patient with chronic heart failure*. Physical Therapy Review, 2008; 13: 227-234.
- Ihdaniyati, Atina Inayah dan Arifah, Siti. *Hubungan tingkat kecemasan dengan mekanisme koping pada pasien gagal jantung kongestif di rsu pandan arang boyolali*. Berita Ilmu Keperawatan ISSN 1979-2697, 2009; 2(1): 9-24
- Jolly, Kate et al. (2009). *A Randomized trial of the addition of home-based exercise to specialist heart failure nurse care: the birmingham rehabilitation uptake maximisation study for patients with congestive heart failure (BRUM-CHF) study*. European Journal of Heart Failure. doi:10.1093/eurjhf/hfn029. Pubmed data base.
- Kusl, Ku, C.H. & Ma, F.C. (2002). *Effects of phase i cardiac rehabilitation on anxiety of patients hospitalized for coronary artery bypass graft in Taiwan*,  
<http://www.ncbi.nlm.nih.gov/pubmed/11910388>. Diakses pada tanggal 3 Maret 2017.
- Lavie, C. J., Milani, R. V., Artham, S. M., & Gilliland, Y. *Psychological Factors and Cardiac Risk and Impact of Exercise Training Programs—a Review of Ochsner studies*. The Ochsner Journal, 2007; 7(4): 167-172.
- Mertha, I.M. (2010). *Pengaruh Latihan Aktivitas Rehabilitasi Jantung Fase Terhadap Efikasi Diri dan Kecemasan Pasien PJK di RSUP Sanglah Denpasar*. Tesis FIKUI. Diunduh, tanggal 15 Juli 2017.  
<http://lontar.ui.ac.id>.
- Myers, Jonatan. *Principles of exercise prescription for patients with chronic heart failure*. Heart Failure Rev., 2008; 13: 61-68.
- McKelvie, R. S., Teo, K. K., Roberts, R., McCartney, N., Humen, D., Montague, T., ... & Yusuf, S. *Effects of exercise training in patients with heart failure: the Exercise Rehabilitation Trial (EXERT)*. American heart journal, 2002; 144(1): 23-30.
- Parish, Tracie., Kosma, Maria & Welsch, Michael A. *Exercise training for the patient with heart failure : is your patient ready ?*. Cardiopulmonary Physical Therapy Journal, 2007; 18(3): 12-20.
- Perry and Potter. (2010). *Fundamental keperawatan*. Jakarta: Salemba Medika.
- Piotrowicz, Ewa et al. *Influence of home-based telemonitored nordic walking training on autonomic system balance in heart failure patients*. Journal of Clinical research Arch Med Sci., 2015; 11(6): 1205-1212.
- Radi, Basuni., Joesoef, Andang H dan Kusmana, Dede. (2009). *Rehabilitasi Kardiovaskular Di Indonesia*. Jurnal Kardiologi, ISSN 0126/3773
- Ransun, Djoni dkk. *Hubungan tingkat kecemasan dengan mekanisme koping pada pasien gagal jantung kongestif di Irina F Blu RSUP Prof. Dr. R. D. Kandou Manado*. JUIPERDO, 2013; 2: 1.
- Rismayanthi, C. *Latihan Aerobik bagi Penderita Hipertensi*. Jurnal MEDIKORA, 2008; IV: 1.

22. Riset kesehatan dasar. (2013). Jakarta: Badan Litbangkes.  
[www.depkes.go.id/resources/download/general/Hasil%20Risksdas%202013.pdf](http://www.depkes.go.id/resources/download/general/Hasil%20Risksdas%202013.pdf), Diakses pada tanggal 10 Januari 2017.
23. Saeidi, Mozghan et al. *Predictors of clinical anxiety aggravation at the end of a cardiac rehabilitation program. res cardiovasc Med.*, 2016; 5(1): e30091. Pubmed Data Base.
24. Smeltzer, Susan C. (2013). *Keperawatan medikal bedah brunner & suddarth*. Alih Bahasa : Devi Yulianti, Amelia Kimin, Ed.12. Jakarta : EGC
25. Suharsono, Toni dkk. *Dampak home based exercise training terhadap kapasitas fungsional pasien gagal jantung Di RSUD Ngudi Waluyo Wlingi*. Jurnal Ilmu Keperawatan, 2013; 1(1). ISSN: 2088-6012
26. Suryanto. (2011). Peranan Olahraga dalam Mengurangi Stress.  
[http://staff.uny.ac.id/sites/default/files/131808680/4.%20Peranan%20Olahraga%20Dalam%20Mengurangi%20Stres%20\(%20WUNY,%20Mei%202011%20%20\).pdf](http://staff.uny.ac.id/sites/default/files/131808680/4.%20Peranan%20Olahraga%20Dalam%20Mengurangi%20Stres%20(%20WUNY,%20Mei%202011%20%20).pdf), diakses tanggal 20 maret 2017
27. Stuart, Gail W. (2013). *Prinsip dan praktik keperawatan kesehatan jiwa stuart*, Edisi Alih Bahasa Keliat, Budi Anna . Singapore : Elsevier.
28. World Health Organization. (2016). *Statistic cardiovascular disease*.  
[http://www.who.int/cardiovascular\\_diseases/en/](http://www.who.int/cardiovascular_diseases/en/), Diakses pada tanggal 3 maret 2017