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THE EFFECT OF ASTHMA EXERCISES ON ASTHMA RECURRENCE IN KOTA BENGKULU 2019

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Abstract

Asthma is the top ten leading cause of death in Indonesia with asthma incidence reaching an average of 2.4% in 2017. Asthma sufferers in Bengkulu province account for 2.4% of cases. Management of asthma can be done non-pharmacologically as asthma exercises. The purpose of this study was to determine the effect of asthma exercises on asthma recurrence of asthma sufferers in Kota Bengkulu through exercise. This study used a quasi-experimental study using a pre-test and post-test with control group design. The sample in this study were 34 people suffering from asthma (16 intervention group respondents and 16 control group respondents) which taken by purposive sampling method. Data collection was used questionnaires and observation formats. Data analysis using Wilcoxon test and Mann Whitney U. The results showed there were differences in asthma recurrence scores before and after asthma exercises in the intervention and control groups. It is concluded there is an effect of asthma exercises on asthma recurrence in the city of Bengkulu in 2019.

Key Words: *Asthma, asthma exercise, asthma relapse, asthma recurrence*

INTRODUCTION

Asthma is a condition in which the airways become inflamed and constricted due to hyperactivity to certain stimuli and are repetitive but reversible. Asthma is fluctuating, meaning it can be calm without symptoms and does not interfere with activity but can also have an exacerbation with mild to severe symptoms and can even cause death (Depkes RI, 2009).

The Global Asthma Report in 2014 estimated that the number of asthma sufferers around the world was 334 million people with increasing prevalence numbers and expected to increase to 400 million by 2025 (Global Asthma Network, 2014). World Health Organization (2016) informs that the prevalence of asthma events in the world is around 235 million with a mortality rate of more than 80.

Symptoms that occur in people with asthma can cause adverse effects such as decreased quality of life, decreased productivity, absence from school, improved health, the risk of hospitalization and even death. Death usually occurs due to sudden stop breathing which often occurs in people with uncontrolled asthma (Permatasari, 2015).

Management of asthma can be done pharmacologically or with drugs that are controller or lozenges. The successful management of asthma is not only done pharmacologically but also non-pharmacologically.

One non-pharmacological therapy that can be done is asthma gymnastics. The purpose of asthma gymnastics is to train the correct way to breathe, flex and strengthen respiratory muscles, train for effective expectations, as well as improve circulation. Asthma exercises are recommended because they train and strengthen the breathing muscles. This exercise can be done three to four times a week with a duration of about 30 minutes. Gymnastics will give results if done at least 4 to 7 weeks (Perhimpunan Dokter Paru Indonesia (PDPI), 2006).

The result of the research of Permatasari (2015) conclude there are differences in lung function after asthma exercises. In line with this, Antoro & Lestari (2019) informs that the intervention group who did asthma exercises had a less frequent recurrence distance than the control group. Asthma recurrence can affect the lives of sufferers and can even be fatal. This can be minimized by preventing non-pharmacology. Based on the description above, the researcher is interested in identifying the accuracy of asthma exercises on the strength of the breathing muscles so that the function of lung ventilation can prevent asthma recurrence in patients

METHOD

Research Design and Subject

The design of this study was a quasi experiment using pre-test and post-test with control group design. This research is divided into two groups where the intervention group will be given asthma and observation while the control group is only observed. The population in this study were all asthma patients in the Kota Bengkulu. The sampling technique used was purposive sampling with a total sample of 32 respondents.

Instruments and Data Analysis Techniques

Data collection is carried out using a questionnaire with form of respondents' characteristics and asthma recurrence factors. Asthma exercises are carried out based on Asthma Gymnastics SOPs and observed using observation sheets. Univariate data analysis uses central tendency for numerical variables and frequency distribution for categorical variables. Bivariate data analysis using Wilcoxon test and Mann Whitney U test.

RESULTS

Table 1. Characteristics of Respondents (n = 32)

Characteristic	Intervention (n=16)	Control (n=16)
Age		
Mean	39.00	39.69
Median	41.00	41.00
SD	13.69	14.24
Min-Max	17-58	20-61
CI *for Mean* 95%	31.70-46.30	32.09-47.28
Gender		
Man	4 (25%)	8 (50%)
Woman	12 (75%)	8 (50%)
Education		
Elementary school	4 (25%)	3 (18.8%)
Middle school		
High school	5 (31.3%)	3 (18.8%)
College	7 (43.8%)	6 (37.5%)
	-	4 (25%)
Profession		
Does not work	10 (62.5%)	7 (43.8%)
Farmers	6 (37.5%)	-
Private	-	6 (37.5%)
Civil servants	-	3 (18.8%)
Long suffered from asthma		
Mean	26.06	17.13
Median	22.50	8.00
SD	13.58	17.34
Min-Maks	8-54	1-50
CI *for Mean* 95%	18.82-33.30	7.88-26.37
Heredity		
Yes	16 (100%)	16 (100%)
No	-	-
Type of medicine		
Oral		
Inhalation	12 (75%)	12 (75%)
Oral and inhalation	1 (6.3%)	4 (25%)
	3 (18.8%)	-

Table 1 illustrates the age of the respondents in the range of 17-61 years with an average age of 39 years in both groups. The majority of respondents who participated in this study were women with 12 people (75%) in the intervention group and 8 people (50%) in the control group. Most respondents' education was high school with a percentage of 43.8% in the intervention group and 37.5% in the control group. The average respondent

who participated in this study did not work with a percentage of 62.5% in the intervention group and 43.8% in the control group. The duration of asthma is in the range of 1-50 years with an average of 26 years in the intervention group and 17 years in the control group. All respondents (100%) have hereditary asthma. The types of drugs used by respondents were mostly oral drugs with a percentage of 75% in both groups.

Table 2: Overview of Asthma Recurrence Scores in the Intervention Group in Kota Bengkulu Health Center in 2019 (n = 16)

Variable	Characteristic	Frequency (f)	Precentage (%)
Pre Intervention	**Relapse**		
	Often	16	100
	Rarely	-	-
	Total	16	100
Post Intervention	**Relapse**		
	Often	14	87,5
	Rarely	2	12,5
	Total	16	100

Table 2 informs that all respondents in the intervention group experienced recurrence of asthma with frequent intensity before being given an intervention and after being given intervention respondents with recurrence in intensity often decreased to 87.5%.

Table 3: Overview of Asthma Recurrence Scores in the Control Group in Kota Bengkulu Health Center in 2019 (n = 16)

Variable	Characteristic	Frequency (f)	Precentage (%)
Pre Control	**Relapse**		
	Often	15	93,8
	Rarely	1	6,3
	Total	16	100
Post Control	**Relapse**		
	Often	9	56,3
	Rarely	7	43,8
	Total	16	100

Table 3 shows that in the control group before intervention, respondents who experienced asthma recurrence with frequent intensity were 15 people (93.8%) and after being given intervention, respondents who experienced recurrence with intensity often decreased to 9 people (56.7%).

Table 4 Average Asthma Recurrence Score in the Intervention Group in Kota Bengkulu Health Center in 2019 (n = 16)

Tendency Central	Intervention Group		*p value*
	Pre Test	Post Test	
Mean	16,63	11,63	
Median	17,50	11,50	
SD	2,630	2,217	0,000
Min-Max	11-20	8-15	
CI for Mean 95%	15,22-18,03	10,44-12,81	

Table 4 illustrates that the average recurrence score of respondents before being given an intervention is at an average of 16.63 with a range of 11-20, after being given an intervention the average recurrence score of the respondents decreased to 11.63. Statistical test results using Wilcoxon test obtained p value of 0,000 ≤ α 0.05 which can be interpreted as there are differences in average asthma recurrence scores before and after intervention.

Table 5 Average Asthma Recurrence Score in the Control Group in Bengkulu City Health Center in 2019 (n = 16)

Tendency Central	Control Group		*p value*
	Pre Test	Post Test	
Mean	13,81	10,38	
Median	14,00	10,50	
SD	3,082	2,363	0,001
Min-Max	9-18	6-14	
CI for Mean 95%	12,17-15,45	9,12-11,63	

Table 5 informs that the asthma recurrence score was on average 13.81 before intervention was given to the control and decreased to 10.38 after the intervention was given. The results of statistical analysis using the Wilcoxon test showed a p value of 0.001 (p value α α 0.05) which means that there were differences in the average asthma recurrence score before and after the intervention.

Table 6 Differences in the average asthma recurrence scores between groups in Kota Bengkulu Health Center in 2019 (n = 32)

Variabel	N	Mean Rank	*p value*
Mardiani, Septiyanti	16	20,59	0,011
	16	12,41	

Table 6 illustrates that the average difference in asthma recurrence scores before and after asthma exercises in the intervention group was 20.59 higher than the control group at 12.41. The results of statistical tests using the Mann Whitney U test obtained p value of 0.011 (p value α α 0.05) so that it can be concluded that there is an effect of asthma exercise on asthma recurrence in Kota Bengkulu in 2019.

DISCUSSION

Asthma Recurrence Score Before and After Asthma Exercise in Intervention and Control Group

The results obtained by asthma recurrence score found that in the intervention group the average score of respondents before and after asthma gymnastics was 16.63 and 11.63 with an average difference of 5.00. In the control group the average asthma recurrence score before and after was 13.81 and 10.38 with an average difference of 3.43. Statistical test results obtained p value 0,000 in the intervention group and 0.001 in the control group so that it can be interpreted that there are differences in the average score before and after the intervention both in the intervention group and the control group.

The results of this study are in line with the study of Loriana (2018) showing that there are differences in the frequency of recurrence before and after the intervention group with asthma exercises combined with the buteyko breathing technique (p = 0,000) is more effective than the control group that is only given gymnastics only (p = 0.001) .

Asthma exercises can increase the strength of the breathing muscles and lung ventilation of asthma patients. This is because asthma exercises cause higher stimulation of the brain center at the vasomotor center in the brain stem resulting in increased arterial pressure and increased lung ventilation. Body movements especially the arms and legs are considered to increase pulmonary ventilation by stimulating propioseptor joints and muscles, which then transmit the excitation impulses to the respiratory center. Hypoxia, which occurs in muscles during exercise, produces afferent nerve signals to the respiratory center to stimulate breathing. This is also because the muscles that

work will form carbon dioxide in extraordinary amounts and use so much oxygen that PCO2 and PO2 change significantly between the inspiration cycle and the expiration cycle of breathing (Guyton, C, & Hall, 2001)

The results showed an average difference in asthma recurrence score in the intervention group was 20.59 higher than the control group by 12.41. Statistical test results obtained p value of 0.011 (p value α α 0.05) which can be interpreted as an influence of asthma gymnastics on asthma recurrence. This study is in line with research conducted by Kusniawati & Wasliyah (2016) at the General Hospital of Tangerang District which informs that there is a relationship between asthma and the quality of life of asthma patients with a p value of 0,000 (p value α α 0.05). Research by Suranggana, Koesbaryanto, & Khoiriyati (2018) also informs that there is an effect of asthma exercises on the frequency of bronchial asthma patients recurrence at Penujak Public Health Center in Central Lombok (p value 0,000 α α 0.05).

Recurrence of asthmatics can arise due to ineffective air flow in the respiratory system, there is a body compensation mechanism. Compensation that can arise in the form of symptoms of shortness of breath, wheezing and difficulty breathing, especially during expiration. Asthma gymnastics is an aerobic exercise that aims to strengthen breathing muscles and improve circulation (Widianti & Proverawati, 2010). Increased circulation can increase oxygen supply to muscle cells including respiratory muscles, so that metabolic processes, especially aerobic metabolism increases and the body's energy will also increase (Guyton & Hall, 2006).

CONCLUSIONS AND SUGGESTIONS

Based on the results of the study it can be concluded that there is the effect of asthma exercises on asthma recurrence before and after the intervention. The average difference in recurrence scores of asthma exercises before and after the intervention in the intervention group was higher than in the control group. Asthma exercises can be used as a form of non-pharmacological management that can be done routinely at home. Health Center can conduct health promotion related to asthma gymnastics to the community and apply it in the form of gymnastics with asthma sufferers in the health center area.

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