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The Effect of Deep Breathing Technique and Lo'i Sto Combination on Decreasing the Symptomps of Asthma Patients at the Area of Public Health Center of Penana'e

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Keywords

asthma;
decreasing;
deep breathing technique;
Lo'I Sto;

Abstract

Asthma is a disease that occurs due to the narrowing of the airway that is reversible in a short time in thick mucus, spasm, and mucosal edema and also desquamation of the bronchial/bronchial epithelium form, due to eosinophilic inflammation with excessive sensitivity. An asthma attack is often triggered by an *Upper Respiratory tract Infection* (*URI*), smoking, emotional stress, physical activity, and antigenic/allergens stimulation including; inhalant that entering the body through breathing, ingestan that entering the body through the mouth, the contaminant that entering the body through the skin contact. This study aims to identify the deep breathing technique with lo'i sto for decreasing the symptomps of asthma between the intervention group and the control group. The experimental research design in this study used a *quasy experimental design*. The research design used was a *non-random control group pretest-posttest design*. A total of 66 people were sampled using the *quota sampling technique* following the criteria inclusion in research studies. Deep breathing technique with lo'i sto is carried out for 3 weeks along with the observing asthma symptoms weekly before and after deep breathing technique with lo'i sto to all of the respondents. Based on the results of data processing using *paired T-test*, shows tha there are differences of asthma symptoms before and after deep breathing techniques with lo'i sto. The results of the study showed a significant decrease in asthma symptoms after deep breathing techniques with lo'i sto.

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Contents

1 Introduction

Asthma is a disease that occurs due to the narrowing of the airway that is reversible in a short time in thick mucus, spasm, and mucosal edema and also desquamation of the bronchial/bronchial epithelium form, due to eosinophilic inflammation with excessive sensitivity. An asthma attack is often triggered by an *Upper Respiratory tract Infection* (*URI*), smoking, emotional stress, physical activity, and antigenic/allergens stimulation including; inhalant that entering the body through breathing, ingestan that entering the body through the mouth, the contaminant that entering the body through the skin contact.

Asthma is a chronic, non-contagious disease, and often recurs attacks (World Health Organization, 2017). Asthma is a serious global health problem that needs to be addressed. Referring to data from the WHO, there are currently about 300 million people suffer from asthma worldwide. There are around 250,000 deaths caused by asthma attacks each year, with the highest number in low-moderate economies countries. The prevalence of asthma is increasing, especially in developing countries due to changes in lifestyle and an increase in air pollution. The Baseline Health Research (Riskesdas) in 2013, reported the prevalence of asthma in Indonesia is 4.5% of the population, with a cumulative number of asthma cases around 11,179,032. Become a burden for sufferers, not only in terms of health care but patients also experienced a decrease in work productivity and family function (Suyono *et al.,* 2001; Thomas, 2004).

The incidence of asthma varies in different countries, but there is a tendency that patients of this disease are increasing in number, although recent asthma drugs are developed (Saily *et al.,* 2014; Setyawan, 2015). The National Health Interview Survey in the United States estimates that at least 7.5 million people of the country's population suffer from chronic bronchitis, more than 2 million suffer from emphysema and at least 6.5 million suffer from one form of asthma. The World Health Organization (WHO) in Word Health Report 2015 states, five major lung diseases constitute 17.4% of all causes of death in the world, each consisting of 7.2% pulmonary infection COPD (Chronic Obstructive Pulmonary Disease) 4.8%, tuberculosis 3.0%, lung/trachea / bronchial cancer 2.1% and asthma 0.3%.

Currently, asthma shows a high prevalence. Based on data from the Global Initiative for Asthma (GINA, 2011), an estimated 300 million people suffer from asthma worldwide and in 2025 it is estimated that the number of asthma patients reaches 400 million. This amount could be greater considering that asthma is an underdiagnosed disease. Poor air quality and changing lifestyles of the community are thought to be the cause of the increase in asthma sufferers (Mardhiah & Hrp, 2011; Masoli *et al.,* 2004; Notoatmodjo, 2010; Pontes-Arruda *et al.,* 2006). Data from various countries show that the prevalence of asthma ranges from 1-18%.

Asthma in Indonesia is included in the top ten causes of morbidity and mortality in children and adults. The Baseline Health Research (Riskesdas) 2013 stated that Indonesia has an average national asthma rate of

4.5% and some provincial figures exceed the national average of the 18 provinces. The top 5 provinces are Central Sulawesi, East Nusa Tenggara, DI Yogyakarta, South Sulawesi, and South Kalimantan. An increase in the prevalence of asthma nationally in 2007-2013 was found to be 1.5 % (Hall & Guyton, 2014; Hassan *et al.,* 2012).

2 Materials and Methods

The experimental research design in this study used a *quasy experimental design*. The research design used was a *non-random control group pretest-posttest design*. The population of this study was asthma patients in the area of the Public Health Center of Penana'e in Bima City. The samples in this study were 66 respondents, each group divided into 33 respondents. Sampling in this study uses a *quota sampling technique* that is the sampling by determining certain characteristics up to the specified quota amount (Hidayat, 2008).

3 Results and Discussions

3.1 Results
Respondent Characteristics

Table 1
Distribution of Respondents Based on Age, Gender, and Body mass of the patients

Variable	Intervention Group		Control Group		*p*
	N	%	N	%	
Age (Mean ± SD)	(56.30± 1.015)		(56.33 ± 1.384)		
Early Middle Age: 36-45	17	100	0	0	0.761
Late Middle Age: 46-55	6	0	7	21.2	
Late Adulthood: 56-65	27	81.8	26	78.8	
Gender					
Male	19	57.6	20	60.6	0.806
Female	14	42.4	13	39.4	
Body Mass (Mean ± SD)	(53.97 ± 0.391)		(54.24 ± 3.103)		0.719
Underweight	0	0	0	0	
Normal-weight	12	36.4	14	42.2	
Overweight	21	63.3	19	57.6	

Table 2
Frequency Distribution Asthma Symptoms in the Intervention Group in Public Health Center of Penana'e 2019 (n=33)

Variable	Intervention Group											
	Pre1		Post1		Pre2		Post2		*Pre3*		Post3	
Asthma Symptoms	n	%	n	%	n	%	N	%	n	%	n	%
Mean ± SD	(3.00±0.00)		*(2.45*±0.50)		*(2.03*±0.17)		*(2.00*±0.00)		(2.00±0.00)		*(1.15*±0.36)	
0-5 : Mild	0	0	0	0	0	0	0	10	0	0	28	84.4
6-10 : Moderate	0	0	18	54.5	32	97.0	33	100	33	100	5	15.2
11-15: Severe	33	100	15	45.5	1	3	0	0	0	0	0	0

Based on table 2 shows that in the pre-test 1 severe asthma symptoms of the intervention group were 33 people (100%) and after being given (post-test) deep breathing techniques with lo'i sto there was a decrease which was about 15 people had severe symptoms and moderate symptoms about 18 people. There is increasing in pre-test 2 of moderate asthma symptoms of intervention group up to 32 people. Then in post-test 2, there was 33 people had moderate asthma symptoms and in post-test 3 there was a decrease in asthma symptoms in the mild category by 28 people.

Table 3
Shows that in the pre-test 1 severe asthma symptoms of control

Group	N	Mean	SD	P
Intervention				
Pre-test 1 – Post-test 3	33	1.848	0.364	0.000
Pre-test 1 – Post-test 1	33	0.545	0.506	0.000
Pre-test 1 – Pre-test 2	33	0.970	0.174	0.000
Pre-test 1 – Post-test 2	33	8.765	3.345	0.000
Pre-test 3 – post-test 3	33	0.848	0.364	0.000
Control				
Pre-test 1 – Post-test 3	33	0.182	0.528	0.056
Pre-test 1 – Post- test 1	33	0.061	2.242	0.160
Pre-test 1 – Pre-test 2	33	0.182	0.392	0.012
Pre-test 1 – Post-test 2	33	0.091	0.292	0.083
Pre-test 3 – Post-test 3	33	0.030	0.585	0.768

Based on table 3 shows that in the pre-test 1 severe asthma symptoms of the control group were 33 people (100%) and after being given (post-test) deep breathing techniques there was a decrease in asthma symptoms which was about 31 people had severe symptoms and moderate symptoms were 2 people. There is increasing in the pre-test 2 of moderate asthma symptoms of the control group up to 27 people. Then in post-test 2 30 people had moderate asthma symptoms and in post-test 3 there was a decrease in asthma symptoms in the mild category were 2, in the moderate symptoms were 2 people and 29 people had severe symptoms (Bandyopadhyay *et al.,* 2008; Bateman *et al.,* 2008; Dahlan, 2009).

From table 4.3 shows that after deep breathing techniques with lo'i sto were given 3 times in 3 weeks it can decrease asthma symptoms by about 54.11%, likewise after being given deep breathing techniques in the control group can decrease asthma symptoms by 8 .51%. Different test results using *paired T-test* obtained

ρ=0.000 which can be concluded that there is a difference between the intervention group and the control group.

Table 4
Effectiveness of the Intervention on Decreasing Asthma Symptoms in the Intervention Group and Control Group

Variable	Df	Mean	F	P
Asthma Symptoms	1	60.669	630.164	0.000
Residue	1			

Tables 5
Repeated Anova of Asthma Symptoms Among the Intervention Group, Control Group in Public Health Center of Penana'e 2019 (n=33)

Variable	P
Pre-test 1 intervention – pre-test 1 control (Mean)	0.000
Post-test 1 intervention –post-test1 control (Mean)	0.000
Pre-tes 2 intervention – pre-test 2 control (Mean)	0.000
Post-test 2 intervention – post-test 2 control (Mean)	0.000
Pre-tes 3 intervention – pre-test 3 control (Mean)	0.000
Post-test 3 intervention – post-test 3 control (Mean)	0.000

From table 4.6 shows that after being given deep breathing techniques with lo'i sto for 3 times in 3 weeks can decrease the asthma symptoms. From the analysis test using *repeated anova*, it showed that the value of ρ=0.000, which means giving a deep breathing technique with lo'i sto to decrease asthma symptoms in the six groups. (F(1,1)=630,164, ρ=0,000). After being tested using the *Post Hoc* test, it showed the effectiveness of the deep breathing technique with lo'i sto, starting on the post of day 1.

3.2 Discussion

Age

The total age of respondents in this study in the intervention group was 56-65 years (late elderly) which about 27 people (81.8%) and in the control group the majority were aged 56-65 years (late elderly) which about 26 people (78.8%). This is in line with the study of Zureik & Orehek (2002). The incidence of asthma in adults mostly occurs in the range of late adulthood. The range of late adulthood has a value of M=45.86, SD=13,945. The exact cause is unknown, but it is suspected that asthma is generally carried over from a young age.

Likewise with the results of a study conducted by Fadzila (2018) the majority age of the respondents were in the final elderly, amounting to 10 people (33.3%), who were classified as non-productive age. The Baseline Health Research (Riskesdas) in 2013 says that the incidence of lung disorders increases with age. This is because in that age category there is a decrease in respiratory function and physical activity that has begun to decrease.

Gender

The majority of respondents' gender in the research was in the highest intervention group, which about 19 miles (57.6%), and in the control group the highest gender were males which about 20 males (60.6%). This is in line with research conducted by Zureik & Orehek (2002), the incidence of asthma in adults is more common in men, but this cannot be explained with certainty. In contrast to the results of a study conducted by Reviona

(2014), which stated that the highest percentage of asthma sufferers by gender were women, with 22 respondents (70.97%).

The majority of asthma sufferers are women due to hormonal influences that occur on them. Estrogen hormone increases corticosteroid production associated with globulin, whereas the hormone progesterone competes with cortisol to relate to the globulin side (Dal Negro *et al.,* 2007; Ducharme *et al.,* 2010; Fithriana, 2017; Gabr & Gab-Alla, 2008). The hormones estrogen and progesterone can affect cortisol free levels which cause a decrease in the amount of cortisol. A decrease in cortisol can cause bronchial constriction, which in turn can cause bronchial asthma attacks. The hormone estrogen can also increase adhesion to endothelial cells in blood vessels as well as a combination of the hormones estrogen and progesterone thereby increasing eosinophil degranulation which facilitates bronchial asthma attacks.

Body mass

The majority of body mass in the control group was in the large body shape category which about 21 people (63.3%) while in the intervention group the most body mass was in the overweight category which about 19 people (57.6%). This shows that there is a relation between being overweight and asthma. These opinions were also expressed by GINA (2006) that being overweight (obesity) is one of the risk factors for asthma triggers.

Identify the decreasing the symptoms of asthma in the control group and intervention group

Based on the analysis it seen there was a decrease in asthma symptoms in the intervention group after being given deep breathing technique with lo'i sto, the severe symptoms were about 15 people and moderate symptoms 18 people. There was an increase in asthma symptoms in the moderate category of up to 32 respondents. Then the post-test 2 for asthma symptoms in the moderate category was 33 people and in post-test 3 there was a decrease in asthma symptoms in the mild category by about 28 people. In the control group shows after being given a deep breathing technique, there was a decrease in asthma symptoms which was severe symptoms 31 people and moderate symptoms, 2 people. In the pre-test 2 asthma symptoms in the moderate category is increased to 27 people. Then the post-test 2 asthma symptoms in the moderate category were 30 people and in post-test 3 there was a decrease in asthma symptoms in the mild category by 2 people, 2 people were in moderate and 29 people were severe category. So the decrease in asthma symptoms in the intervention group was greater than in the control group.

Asthma, which is currently seen as an inflammatory airway disease, cannot be separated from the influence of allergens. Specific allergens are very subjective, depending on the sensitivity of each asthma sufferer. Repeated exposure to a specific type of allergen will cause an immediate allergic reaction, such as a type I hypersensitivity reaction in asthma (Katz *et al.,* 2002; Todokoro *et al.,* 2003; Hahn *et al.,* 1998). Allergy cannot be cured, the only way is to avoid exposure to specific allergens, which was the biggest source is from the environment.

Specific allergens can be food, drink, animal's or plant's body parts, and others. In everyday life, people with asthma cannot be completely free of these specific allergens. Food allergens such as green vegetables and fresh fruit, for example, asthmatics tend to continue to consume these foods even though their frequency is reduced, for various reasons. One of them is due to the availability of reliever medicines at home (Rosenzweig *et al.,* 2000; Hanley *et al.,* 1999; Mah *et al.,* 2000). This is very worrying because the side effects of anti-asthma drugs are also dangerous. However, asthma sufferers prefer to consume drugs rather than avoiding exposure to specific allergens. Therefore, clinical manifestations of asthma cannot be avoided.

Differences in asthma symptoms before and after the intervention in intervention and control group

A decrease in asthma symptoms after being given a deep breathing technique with lo'i sto for 3 times in 3 weeks can reduce asthma symptoms as much as 54.11%. The results of this study are in line with research conducted by Putri Ratna Kartini stated that red ginger or spicy roots can help asthmatics breathe more easily. In the study, researchers investigated whether the red ginger component could increase the effects of beta-agonists. An asthma drug called beta-agonist (β-agonist) works by relaxing smooth muscle (ASM) tissue in the

airways. Elizabeth Townsend, a doctor at Columbia University's Department of Anesthesiology stated that in the study, the red ginger component can work synergistically with β- agonist to relax the muscle tissue in the airways or called ASM.

In the study, researchers took ASM samples for the neurotransmitter acetylcholine. The team then combined isoproterenol β-agonists with three separate red ginger extracts: 6-gingerol, 8-gingerol, or 6-shogaol. This statement is in line with research that states the effect of giving extra red ginger to alveolar dilation of lungs exposed to allethrin due to the presence of gingerol and shogaol compounds that have antioxidant activity. Gingerol, which is one of the active compounds in red ginger oleoresin, is known to be antioxidant and as an inhibitor of an enzyme that produces superoxide anion and inhibits cell proliferation caused by free radicals, both endogenous free radicals or exogenous free radicals.

In the control group after being given deep breathing techniques there was a decreasing asthma symptoms by 8.51%. The results of this study are in line with research conducted by Setyawan, who stated that the more frequent exercise such as asthma exercises, the frequency of asthma attacks will become less. According to Hoedijono (2005) in M. Mardhia Respiratory exercise is beneficial to reduce asthma symptoms in a causative manner by improving the system immunity that works unbalanced in the body as a major cause of hypersensitivity reactions.

Respiratory exercise can increase IgG gradually during regular exercise (Siswantoyo, 2007; Yusuf *et al.,* 2016; Enzle & Ross, 1978; Hamilton *et al.,* 1991), so it can reduce hypersensitive reactions that trigger inflammatory reactions in the bronchus and cause a bronchial narrowing and produce secretions to produce cough reflexes for sufferers. This can reduce closed lung ventilation and inflammation can slowly reduce the force of expiration and ultimately can reduce wheeze sounds and chest feeling depressed.

Effectiveness of deep breathing techniques with lo'i sto on decreasing asthma

Decreased asthma symptoms after being given a deep breathing technique with lo'i sto for 3 times in 3 weeks can reduce asthma symptoms by 54.11%. With ρ value of anxiety level between the intervention group and the control group is 0,000. Using the *Poct-Hoc test* shows that the effectiveness of the Deep Breath Technique with Lo'i Sto being in the post-test the first week of the seventh day is very significant with a ρ=0,000.

Breathing exercises are also one of the supporters of asthma treatment because the success of asthma treatment is not only determined by the drugs consumed, but also nutrition and exercise factors. The purpose of deep breathing relaxation techniques is to practice correct breathing, flexing, and strengthening breathing muscles. So relaxation techniques are great at home. Deep breathing relaxation techniques are a form of nursing care, in which nurses teach patients how to breathe deeply, slow breathing (hold inspiration to the maximum) and how to exhale slowly.

Besides being able to reduce respiratory symptoms, deep breathing relaxation techniques can also improve pulmonary ventilation and increase blood oxygenation. In asthmatics, it is very good if performed or given deep breathing relaxation techniques that one of its benefits is; if not in a breathing exercise (deep breathing relaxation techniques) are needed to prevent shortness of breath attack, improve lung function so that the attack of shortness of breath does not occur and settled the mind and reduce anxiety.

4 Conclusion

Based on data processing and analysis of deep breathing techniques with lo'i sto on decreasing the symptoms of asthma, the following conclusions can be drawn:

1) Asthma symptoms for 3 weeks tended to decrease in both the intervention group and the control group, but the intervention group had a greater decline than the control group.
2) There were significant differences in asthma symptoms during the 3 weeks pre and post-intervention between the intervention group and control groups (ρ=0.000).
3) Regarding deep breathing techniques with lo'i sto effective on decreasing asthma symptoms obtained ρ=0,000.

Suggestions

1) For Educational Institutions
   Can provide input for the development of science as learning material to improve the health skills of health workers.
2) For Health Services
   The provision of deep breathing techniques with lo'i sto needs to be applied especially by nurses when asthma symptoms appear. Provision of deep breathing techniques with lo'i sto can be given as nursing interventions to be performed on Asthma patients, therefore, nurses must have the ability and skills
3) For Further Researchers
   Future studies need to add or include other variables in the form of physical impact on asthma patients undergoing hemodialysis or increase the number of samples that can affect asthma symptoms so that the coefficient of determination can be significantly more varied.

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