

# EFFECTIVENESS OF BUTEYKO BREATHING TECHNIQUE AND PURSED LIP BREATHING TECHNIQUE IN IMPROVING PEAK EXPIRATORY FLOW RATE IN PATIENTS WITH ASTHMA

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## ABSTRACT

**Purpose:** This study aims to determine the differences effectiveness of Buteyko Breathing Technique and Pursed Lip Breathing Technique in improving Peak Expiratory Flow Rate (PEFR). **Method:** This study is a research experiment with pre test-post test design to know the difference of a given exercise of the research object. Samples are grouped into the treatment group I consists of 7 people with Buteyko Breathing Technique as well as the treatment group II consisted of 7 people with Pursed Lip Breathing Technique. **Result:** normality test result normality of the data found, and homogeneity test resulting homogeneity of the variance found. In hypotheses 1 before exercise  $191,43 \pm 29,681$  and value after exercise  $420,00 \pm 60,00$  with p-value 0,001. In hypotheses 2 before exercise  $200,00 \pm 36,515$  and after exercise  $350,00 \pm 72,111$  with p-value 0,001. The test hypothesis 3 the show mean difference on h1 is  $2287,57 \pm 41,404$  and mean difference on h2 is  $150,00 \pm 39,158$  in p value = 0,003. **Conclusion:** Buteyko breathing technique more significant in improving peak expiratory flow rate than pursed lip breathing technique, and can be used as a clinical reference.

**Keywords:** Peak Expiratory Flow Rate, Buteyko Breathing Technique, Pursed Lip Breathing Technique.

## PENDAHULUAN

At present we lived in the days of which keeps growing, a lot of innovation who have sprung. This provides of the various effects of, either positive or negative. In terms of them is many development out the negatives, industry that produces waste that were significant make the invironment quality worse like water, land, and air. According to vitahealth website, the ozone rises to 73%, the heppened this aggravate air quality, many pollution causing trouble breathing the people that allows in the next decade will have harmful effects health as

diseases which are disturbing breathing especially asthma. asthma remains a big problem public health serious around the world. The prevalence of asthma has improved significantly since the 1970s. In 2010, there had been around 300 million suffering from asthma around the world. In 2009 asthma has caused 250.000 death globally (Andri, 2012). According to the report of WHO (world health organization) 2013, at present is around 235 millions of world population affected by asthma. BRFSS (behavioral risk factor surveillance survey) years 2002-2007 reported on florida prevalence of asthma adults as many

as 10,7%. Asthma according to health survey households (SKRT) 1986 ranked the fifth of 10 cause in pain (PDPI, 2006). Asthmatics in indonesia is 7.7% with details men 9.2 % and women 6.6 % (PDPI, 2006).

Asthma is the disease inflamatori chronic an airway characterized by simtom variable and recurring, obstruction and bronkospasm air reversible. Symptoms include wheezing, cough, shortness of breath, and shortness of the chest. Clinically, asthma classified according to: frequency simtom, volume expiratory force in 1 second (FEV1) and peak expiratory flow rate (PEFR). Asthma also can be classified as: asthma atopic (extrinsic) or asthma non atopic (intrinsic) (Andri, 2012). In asthma people often consider that the disease by lack of oxygen in so that they think inspiration they is limited, but actually in people with asthma, expiratory they is declining so as to cause many air trapped alveoli and deteriorates the symptoms of asthma. This thing can be known through examination current the top expiratory.

Peak expiratory flow rate is the top of the rate of flow of maximum which is produced during respiratory strong, ranging from the lungs full of inflation. The rate of flow of the top of the stream of the channel reflect the air that large and depends on efforts to

the muscular strength of patients. On the person asthma, when the value of ape declining then this shows state of a person is being in exacerbation or early signs of exacerbation of. This shows that there were obstruction respiratory when be left or not controlled will cause air trapped pulmonary will increased so that the gas exchange in alveoli will be threatened, this may lead to adverse effect on the heart, muscle breathing tired (fatigue) and later happened failed to breath .Although asthma is disease reversible that cannot be in removed it can in reduce symptoms and level a recurrence his, in this case physiotherapy also have an important role.

According to PERMENKES no 80 2013, physiotherapy is a form of health services devoted to individuals and / or group to develop, maintaining and restore motion and function the body along the length of life by using management is manual, increase of motion, equipment ( physical, elektroterapeutis and mechanical ) training function, communication.

### ***Buteyko breathing technique***

Buteyko breathing technique is a system breathing exercises and behavioral change intended to improve the health of by changing balance oxygen and carbon dioxide in the air in exhales (cowie et al, 2008). The concept of buteyko understand

physiologically that basic the cause of asthma habit of breathing to excess who do not realized that so as to cause deficiency oxygen, so by doing techniques of breathing buteyko aims to overcome problems the decline in co2 levels to come back in normal levels therefore, there will be effect relaxation in the muscles plain the bronchi and open the airway (Dupler, 2012). This will help in raising the current the top expiratory in people with asthma. Oxygenation fluent will also sent down scene hypoxia, hyperventilation and apnea while sleeping in people with asthma.

### **Pursed lip breathing technique**

Pursed lip breathing is breathing exercises aimed at expelling air (exhalation in a slow manner through the mouth with the lips cones or like whistling), breathing exercises it consists of exercises and respiratory practice being utilized to achieve vent which better controlled, efficient and reduce working breathing (smeltzer & bare, 2013). Breathing with the pursed of lips can improve transfer o2 who help to drive down exclusion of air stuck , so that it can be control expiratory to facilitate emptying alveoli maximally (Aini, 2008). Way it was expected to be cause pressure when expiratory, the air slowed and increased pressure in the abdominal cavity distributed until bronchiole so that collapsed an airway

when expiratory can be prevented and make the conversion gas smoothly, and peak expiratory flow rate can increase.

Based on the background the problem, researchers interested to study and understanding regarding the effectiveness of buteyko breathing technique and pursed lip breathing to increase in the the top expiratory in asthma.

### **Research methodology**

Research methodology this is a quasisperimental when there can be controlled in full by researchers. The research was done to study the influence of the provision of exercise buteyko breathing technique by the exercise pursed lip breathing technique on the ape in asthma bronchial. The enhancement of value ape in asthma is measured using peak flow meters.

Researchers used design research randomized pre test and post test group design , with 14 sample divided into 2 the treatment group. The treatment group 1 as many as 7 people given intervention buteyko breathing technique , and the treatment group 2 as many as 7 people given intervention pursed lip breathing .Given intervention for 6 weeks. Before it was given intervention sample measured first value current the top expiratory by using peakflow meters. Research was carried out in RW.07 Lubang Buaya,

Cipayung of east jakarta , capital city of Jakarta .

Technique the sample collection namely by randomize sample formerly already meet the criteria of inclusion of sample namely men and women with age 18-40 years that experienced asthma persistent being, but not is exacerbation, not had heart disease, hypertension and contraindication intervention the other and willing to be research sample areas until all.

### Results and Discussion

population taken from residents RW.07 lubang buaya, kec .Cipayung, east Jakarta, city of Jakarta .Of the visit for 6 weeks, commenced in january up to february 2017. Overall sample were 14 people, consisting of 9 people women and 5 men, one in which were divided into two groups. In the treatment group I as many as 7 people given intervention buteyko breathing technique and 7 people in the treatment group II given intervention pursed lip breathing technique. These sample were each given intervention as many as 19 times in one month more two weeks with the frequency of the 4 times a week on sunday first and 3 times a week on next week.

**Table 1**

<b>Sampel</b>	<b>Sebelum Latihan</b>	<b>Sesudah Latihan</b>	<b>Selisih</b>
1	180	450	270
2	250	510	260
3	180	420	240
4	160	310	150
5	200	430	230
6	200	400	200
7	170	420	250
Mean	191,43	420,00	228,57
SD	29,681	60,00	41,404

From the data table 1, the data collected from the top of the measurement of the current expiration with peakflow feet high at the treatment group 1 before it was given intervention produce its mean value 191,43 , with a standard deviation 29,681. While after intervention produce values mean 420,00, with standard deviations 60,00.And on a calculation the difference between before and after given intervention buteyko breathing technique produce values mean 228,57 with standard deviations 41,404. In the treatment group 2 to the measurement of the current the top expiratory done before and after exercise obtained the result as follows:

**Table 2**

<b>Sampel</b>	<b>Sebelum Latihan</b>	<b>Sesudah Latihan</b>	<b>Selisih</b>
1	150	250	100
2	250	430	180
3	200	320	120
4	180	350	170
5	240	440	200
6	210	380	170
7	170	280	110
Mean	200,00	350,00	150,00
SD	36,515	72,111	39,158

From the data table 2, data derived from measurement current the PEFR with peakflow meters in the treatment group 2 before it was given intervention produce values mean 200,00, with standard deviations 36,515. While after intervention produce values mean 350,00, with standard deviations 72,111. And if adopted calculation the difference between before and after given intervention pursed lip breathing produce values mean 150,00 with standard deviations 39,158.

On testing is hypothesized 1 use paired test sample test by the number of 7 people to intervene in buteyko breathing technique and measured the top of the value of the current expiration by using peakflow

meters, obtained the top of an increase in the current expiration that can be seen from its mean value and SD before exercise namely  $191,43 \pm 29,681$ . Its mean value and SD increase after done the measurement of the end or after intervention for 6 weeks that is  $420,00 \pm 60,000$ . Based on the results of the paired sample test on the data obtained value p-value 0,001 where if value  $p < 0.05$  so  $H_0$  rejected. So that it can be concluded that buteyko breathing technique able to increase the flow the top expiratory in asthma.

According to A.J. Opat et al (2013) a clinical trial of buteyko breathing technique in asthma us taught by a video . Concluded that buteyko breathing technique can increase the value of ape in asthma. It can happen because this method having special features focused on sent down the frequency of respiratory .Asthmatics will experience hyperventilation that causes the low levels of  $CO_2$  followed by shifts effect bohr resulting in oxygenation will decrease.

The frequency of breath optimal to the principle of the exercise of breathing shallow breathing a decrease in the frequency of bringing  $CO_2$  levels at normal levels , so that optimal oxygenation of the will and serves to reduce constricting the airway.

On testing is hypothesized II used paired sample test on the treatment group 2 with the total sample 7 people to intervene in pursed lip breathing and measured the PEFR by using peakflow meters, obtained the top of an increase in the current expiration that can be seen from its mean value and SD before treatment 2 to  $200,00 \pm 36,515$ . Its mean value increase after done the measurement of PEFR at the end having given intervention for 6 weeks that is  $350,00 \pm 72,111$ . Based on the results of the paired sample t-test on the data were obtained value p-value 0,001 where if value  $p < 0.05$  so  $H_0$  rejected. So that it can be concluded that pursed lip breathing technique able to increase the flow the top expiratory in asthma.

According to G. Shine (2016) comparison of effectiveness of diaphragmatic breathing and pursed lip expiratory flow rate and chest expansion in patients with the bronchial asthma. This journal explain how the comparison between diaphragma breathing with pursed lip breathing, and the result 2 treatment is equal same can increase the value of APE. In journal mentioned the provision of pursed lip breathing and diaphragma breathing to improvements in patterns of respiratory that would improve gyrations the way a current of air of the respiratory tract usually caused by the presence of

deafness the airway of the respiratory tract. And can also repair flexibility in the cavity of the chest and the diaphragm, and can exercise the expiratory muscles to extend exhale and increased pressure the airway during expiration, thus reduce the number of prisoners and a trap air of the respiratory tract. If this technique be conducted regularly and is true then can optimize function mechanical pulmonary, and the increasing volume of the end of expiratory pulmonary and peak expiratory flow rate.

In testing is hypothesized III use test t-test independent in the treatment group 1 and treatment 2. The data can be seen is its mean value the difference the treatment group 1 its mean value and SD that is  $228,57 \pm 41,404$ . And its mean value and SD in the treatment group 2 namely  $150,00 \pm 39,158$ . Based on the results of the with t-test independent the data produced value  $p = 0,003$  where the value of  $p < 0.05$  so the calculation on those statistics  $H_0$  rejected, can be concluded that the difference increase in value current the top expiratory between buteyko breathing technique and pursed lip breathing in asthma.

In journal before, Narwal ravinder (2013) with journal "a study of effect of buteyko breathing technique on an asthmatic patients" Also concludes that buteyko breathing and pursed lip breathing effective

to increase the flow of the top eksprasi in patients asthma. This is because caused second exercise it can be relaxasing the respiratory muscles as they same same use breathing diaphragma so breath more efficient, and the same same can mendilatasi an airway that narrows or spasm of.

And according to megha v chavda and hesthri m shah in a journal "to compare the efficacy of pursed lip breathing and buteyko breathing technique to reduce the symptoms of exercise induced asthma in obese children" explain the difference buteyko breathing with pursed lip breathing in lowering symptoms of asthma on child, in this journal also discussed how the influence of value ape in asthma, of results gathered in jurnalnya mentioned that both the treatment equally can increase the value of ape in asthma, but there is a difference in the effectiveness of between buteyko breathing technique with pursed lip breathing technique in increase the value of ape in asthma. Although both can increase ape in asthma, but buteyko breathing technique looks more effective because of the advice provided for patients to sleep with kept their mouths shut, although that is only commentary in this training, but this is proved effective Because in the journal mentioned that the majority of a person who has asthma will open his mouth or snores

while sleeping, this will make the respiratory tract easily irritated by dust or allergen during which the patient bed, this shall be no rarely a symptom of the night or the morning on an asthmatic patient this arising, then to this buteyko breathing suggest to sleep with shut mouth by using papertape the study was call so patients accustomed to sleep with the mouth closed with so the oxygen deeper optimal who made an effect that both in the top of an increase in the current expiration treatment on this one.

## **Conclusion**

Based on the research done above so can be concluded that:

Buteyko breathing technique able to increase the peak expiratory flow rate in asthma.

Pursed lip breathing technique able to increase the peak expiratory flow rate in asthma.

There is a difference in increas current the PEFr between buteyko breathing technique and pursed lip breathing in asthma.

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