

## The Effect Of Prone Position And Clapping On Secretion Exhaust And Oxygen Saturation In Patients With Obstructive Pulmonary Disease (COPD) At Kaimana Regional Hospital

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### ABSTRACT

Disease lungs obstructive chronicle (COPD) is disease lungs Which marked by an increase resistance to air flow that is not completely reversible. Disease This is reason main morbidity and mortality which is chronic in the world. Every year many people suffer and die world because of this disease and its complications. This study aims to to determine the EFFECT OF PRONE POSITION AND CLAPPING ON SECRETION EXHAUST AND OXYGEN SATURATION Type study This is study quantitative with design study one group pre-posttest design. Sample on the process This using 7 Respondents Which suffer COPD. Analysis bivariate use test Wilcoxon Which aiming for know influence variable Prone Position and Clapping against secretion discharge and oxygen saturation. Results analysis bivariate use test Wilcoxon obtained mark p value = 0.025 then p value < 0.05 so H<sub>0</sub> rejected and H<sub>1</sub> accepted means there is The Effect of Prone Position on Breathing in Patients with Lung Disease Obstructive Chronicle (COPD). The prone position is a prone position that is recommended as an effort to overcome respiratory problems, namely reducing shortness of breath. The prone position is a position that is recommended as an effort to overcome respiratory problems, namely reducing shortness of breath. body client prone position where the head is lower than the shoulders, making the lung load more evenly distributed so that it can increase oxygen flow. This position is also believed to reduce lung pressure by intra-abdominal organs so that it will improve oxygenation and carbon dioxide clearance. Chest physiotherapy / Clapping is done by patting the chest or back to help loosen thick mucus in the lungs, so that it can come out easily through coughing. The conclusion of this study is that there is an effect of prone position and clapping on secretion discharge and oxygen saturation in patients with obstructive pulmonary disease (COPD).

**Keyword** : Clapping, COPD, Prone Position

### INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) or which is also called Chronic Obstructive Pulmonary Disease (COPD) (WHO, 2022), is a lung disease that marked with obstruction chronic flow air in lungs Which bother breathing normal and is one of the causes of death. According to the Global Chronic Obstructive Lung Disease (GOLD), COPD is a lung disease characterized by respiratory symptoms persistent and limited airflow due to airway obstruction and/or abnormalities alveolar Which due to particles or gas dangerous (GOLD, 2020).

COPD affects 65 million people worldwide in moderate to severe levels. severe. More than 3 million people died and became the fifth leading cause of death in the world (WHO, 2022). This figure is projected to increase by more than 30% in 10 years. forward except, If

There is action quick For reduce factor risk Which affect the disease. COPD is also a leading cause of death in America, However Lots public Which No realize that COPD is problem health national main (NIH, 2019).

This trend also occurs in Indonesia, COPD is one of four non-communicable diseases. infectious main Which 60% cause death (Ministry Health Republic of Indonesia, 2019). Results The 2018 Basic Health Research (RISKESDAS) found a prevalence of lung disease obstructive chronic (COPD) in Indonesia as much as 3.7%, highest in Province Lampung (1.4%) And more often happen on type sex man (Ministry Health Republic of Indonesia, 2018). On In 2024 , the prevalence of COPD in West Papua reached 2.8% of the national figure. (Ministry Health Republic of Indonesia, 2013). Results studies introduction in Emergency Room HOSPITAL. Kaimana obtained amount patient COPD in month July year 2024 as much as 20.

Smoking is said to be the main risk factor for COPD. Related to this That, Indonesia is Wrong One country develop Which own amount smoker active high. The World Health Organization (WHO) has designated Indonesia as country the biggest third in world as user cigarette (WHO, 2022). Presentation smoke in the population aged  $\geq 15$  years in 2021 in West Papua amounted to 23.37% (Body Center Statistics, 2021).

Complaints that often arise in patients with chronic obstructive pulmonary disease (COPD) are shortness of breath, increased sputum production and limited activity (Khotimah, 2013). The result of excessive sputum can cause sputum to accumulate. and as a result the airway clearance is ineffective and finally the main response is shortness of breath. breath. Congested breath Which in progress long And No quick handled will result in emergence cyanosis (pale), fatigue And feel weak. If matter the no quick overcome, matter furthermore Which will happen adhesion road breath And causes obstruction (blockage) of the respiratory tract (Nugroho, 2011). Other effects of sputum excess accumulation increases the risk of infection, due to excess sputum the can become place his life pathogen Which can dangerous. Besides that complications Which see arise along with production mucus Which excessive will causing hypoxemia to lung collapse which will result in pneumothorax, complications other consequence disease lungs obstructive chronic (COPD) is cor pulmonary Which Can cause death (Black & Hawks, 2014). Action Which Can done for sufferer COPD is with method pharmacology And non pharmacology.

Implementation in a way pharmacology is giving antibiotics, bronchodilator and expectorant, whereas For implementation on patient COPD in a way nonpharmacology includes oxygen therapy, *prone position*, deep breathing exercises, effective coughing exercises, and clapping. One of the recommended supportive therapies is prone positioning (PP), which is a cycle of lying on the back, sleeping on the side, then lying on the stomach to increase oxygenation with the mechanism of gravity and clapping, which is a nursing action that can be done to help remove secretions and increase respiratory efficiency and help clear the airways. In line with research conducted by Altinay et al. (2022) and Caputo et al. (2020) which stated that PP provided a positive response in COVID-19 patients, including a more significant increase in oxygenation compared to standard care as evidenced by laboratory tests and SpO<sub>2</sub> examinations.

Based on description in on, so researcher interested For do study, the effect of prone position and clapping on secretions and oxygen saturation, because the application of the clapping and prone position techniques is Wrong One action intervention nursing Which effective compared to with therapy pharmacological that own effect side more big against response.

## METHOD

One-group pre-posttest design research is a study that assesses the results before and after an intervention or action is assessed in one group only. In this study, researchers assessed the saturation and secretion output before and after prone position and clapping were performed in patients with chronic obstructive pulmonary disease (Nursalam, 2014).

The population in this study were all COPD sufferers. who visited the KAIMANA Regional Hospital by taking samples of 7 person.

## RESULTS

### 1. Respondent Characteristics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	early adulthood (26-35 years)	1	14.3	14.3	14.3
	late adulthood (36-45 years)	1	14.3	14.3	28.6
	early elderly (46 - 55 years)	1	14.3	14.3	42.9
	late elderly (56 - 65 years)	3	42.9	42.9	85.7
	Seniors (>65 years)	1	14.3	14.3	100.0
	Total	7	100.0	100.0	

Table 1. Respondent Characteristics Based on Age

Based on table in on obtained that from 7 respondents, patient most Lotsaged 56- 65 years as much as 3 person (42.9 %).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Woman	2	28.6	28.6	28.6
	Man	5	71.4	71.4	100.0
	Total	7	100.0	100.0	

Table 2 Respondent Characteristics Based on Gender

Based on table in on obtained that from 7 respondents, patient most Lots Male gender as much as 5 person (71.4%).

### 2. Analysis Bivariate

		Ranks		
			Mean Rank	Sum of Ranks
Post Test Saturation - PreTest Saturation	Negative Ranks	a	.00	.00
	Positive Ranks	b	4.00	28.00
	Ties	c		
	Total			
Posttest secretion output - Pretest secretion production	Negative Ranks		.00	.00
	Positive Ranks	e	4.00	28.00
	Ties	f		
	Total			

Post Test Saturation < PreTest Saturation  
 Post Test Saturation > PreTest Saturation  
 Post Test Saturation = PreTest Saturation  
 Post-test secretion output < Pre-test secretion production  
 Secretion Posttest > Secretion Production PreTest  
 Post-test secretion output = Pre-test secretion production

**Test Statistics <sup>a</sup>**

	Post Test Saturation - Pre Test Saturation	Post test secretion production - Pre test secretion production
Z	-2.410 <sup>b</sup>	-2.646 <sup>b</sup>
Asymp. Sig. (2-tailed)	.016	.008

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

Based on Table 3, namely the results of the analysis using the Bivariate Test using the Wilcoxon Test, the data obtained :

1. Negative Rank or Difference (Negative) between the saturation value for pretest and posttest is 0. Both in the N value, Mean Rank and Sum Rank. This value of 0 indicates that there is no decrease (reduction) from the pretest value to the post test. Likewise, the value of pretest and posttest secretion expenditure is 0. Both in the N value, Mean Rank and Sum Rank. This value of 0 indicates that there is no decrease (expenditure) from the pretest value to the post test.
2. Positive Rank or Difference (Positive) between saturation value and secretion output for pretest and posttest here there is positive Rank data of 7, which means there are 7 respondents who experienced changes or increases in saturation value from pretest to posttest, while the mean or average increase is 4.00 while the Number of Positive Rank or Sum of Rank is 28.00. This value has similar data with the respondent's secretion output value.
3. Ties are the similarity of pretest and posttest values. Here, both saturation and secretion output values have a tie value of 0, which means that there are no respondents who have the same saturation and secretion output values between the pretest and posttest.

Based on the basis of decision making in the Wilcoxon test:

1. If the Asymp.Sig value (2. Tailed) is smaller than (< 0.05) then Ha is accepted.
2. On the other hand, if the Asymp.Sig (2.Tailed) value is greater than (> 0.05)

then Ha is

rejected.

So based on the statistical output in Table 4 above for the statistical test of the Pretest-Posttest saturation value, it is known that Asymp.Sig (2.Tailed) is worth 0.016, then pValue < 0.05 so it can be concluded that "Ha is accepted" meaning there is a difference between the saturation values for the pretest and posttest.

So it can also be concluded that "There is an influence between the provision of Prone Position and Clapping on the Oxygen Saturation Value of respondents"

And based on the statistical output in Table 4 above for the Pretest-Posttest secretion expenditure statistical test, it is known that Asymp.Sig (2.Tailed) has a value of 0.008, so pValue <0.05 so it can be concluded that "Ha is accepted" meaning there is a difference between secretion expenditure for the pretest and posttest.

So it can also be concluded that "There is an influence between the provision of Prone Position and Clapping on the secretion of respondents".

## DISCUSSION

### a. Respondent Characteristics Based on Age

Respondent characteristics based on age that are most in accordance with ( table 1) ) were aged 56-65 years as many as 3 people (42.9%). This result is likely because in elderly patients the cardio respiratory system experiences decreased endurance and decreased function. Changes in the chest wall cause decreased chest wall *compliance* and decreased elasticity of the lung parenchyma, increased mucous glands and thickening of the bronchial mucosa. There is an increase in airway resistance and decreased lung function such as forced vital capacity ( *FVC* ) and forced expiratory volume in the first second ( *FEV1* ) (Khairani, 2010).

### b. Respondent Characteristics Based on Gender

The characteristics of respondents based on gender that are the most numerous according to table .2 are male, as many as 5 people (71.4 %). The results of this study are in line with the results of research by Fajrin, Indra & Burhanuddin (2015) which showed that the most common respondent characteristics based on gender were male and female. The majority of the population was male, 38 (88.4%) people.

Another study conducted by Rahmatika at Aceh Tamiang Hospital in 2007-2008 found that based on the severity of severe COPD, it was mostly suffered by men because awareness of seeking treatment increased after the disease became severe (Rahmatika, 2009).

This is likely due to the influence of social interactions. According to Riskesdas Data (2023), the prevalence of smoking according to gender is that the prevalence of male gender is greater at around 62.9% than females at around 4.8%. Most COPD is caused by inhalation of cigarette smoke and other harmful particles that can damage lung tissue. The structure of the lungs consists of tubules called bronchial trees that end in alveolar sacs. The entry of foreign molecules can cause an abnormal inflammatory response that causes smooth muscle contraction, mucous gland hypertrophy, and mucosal edema. As a result, chronic bronchitis occurs and its symptoms such as increased thickness of the airway walls, mucus hypersecretion, ciliary dysfunction, and bronchial narrowing.

### c. Influence Prone Position and clapping Against Oxygen Saturation Value

Based on Negative Rank is 0. Both in the N value, Mean Rank and Sum Rank. This value of 0 indicates that there is no decrease in oxygen saturation value after prone position and clapping are performed on respondents. While the Positive Rank value is 7, which means that there are 7 respondents who experienced an increase in oxygen saturation value after prone position and clapping exercises.

The results of this study are in line with the results of a study conducted by Selma Arık and Kıvanç Çevik (2021), which showed that prone position and clapping were performed twice a day, morning and evening for 3 days, there was a statistically significant difference ( $p < 0.05$ ) in the examination of oxygen saturation in patients with COPD (Arık & Çevik, 2021). This is also in line with research (Sri Mulati Nendah Agreta , 2021) Which shows additional information and data on the prone position is more effective in a certain percentage level giving an impact on oxygen saturation. Research recommendations in the form of providing independent nursing intervention techniques that can be applied to the prone position in Covid-19 patients are more effective than semifowler with the criteria for increasing oxygen saturation above 95%.

The prone position can increase oxygen saturation in patients. The prone position can improve oxygenation by creating sufficient transpulmonary pressure to exceed the opening pressure of the airway in the dorsal lung area. The prone position can also reduce mortality in patients.

**d. The effect of prone position and clapping on secretion discharge**

Based on Negative Rank is 0. Both in the N value, Mean Rank and Sum Rank. This value of 0 indicates that there is no decrease in secretion output after prone position and clapping are performed on respondents. While the Positive Rank value is 7, which means that there are 7 respondents who experienced an increase in secretion output after prone position and clapping exercises.

Based on The above data can be concluded that there are benefits and effects of the application of chest physiotherapy and effective coughing to reduce shortness of breath and remove phlegm that is stuck in COPD patients. Both respondents underwent chest physiotherapy and effective coughing procedures that were able to reduce shortness of breath and help remove phlegm that could not be removed before.

This is in line with research conducted by Indira by Indira Rifka in 2020 which stated that there is an effect of chest physiotherapy and effective coughing proven to reduce shortness of breath and overcome ineffective coughing. In Dewi Purnamawati's 2020 study, chest physiotherapy and effective stones were also proven to reduce shortness of breath and ineffective coughing, as evidenced by her research, chest physiotherapy and effective stones in COPD patients.

The result of excess sputum can cause sputum to accumulate. and as a result the airway clearance is ineffective and finally the main response is shortness of breath. breath. along with production mucus Which excessive will causing hypoxemia until collapse lungs Which will end with pneumothorax, complications other consequence disease lungs obstructive chronic (COPD) is cor pulmonary Which Cancause death (Black & Hawks, 2014). So to stimulate the release of secretions, this is done series action in implementation clapping that is postural drainage, chest percussion, and vibration. When performing postural drainage the patient is positioned various position based on anatomy tracheobronchus. Matter This done during time certain so that the influence of gravity will help the flow of secretions. In this technique, the lobe or segment to be channeled is positioned so that it lies on the main bronchus, then the secretions will flow into the bronchi and trachea to then coughed up out (Afiyah, 2016),

**CONCLUSION**

Value, namely Asymp.Sig (2.Tailed) is worth 0.016, then  $p$ Value  $<0.05$  so it can be concluded that "Ha is accepted" meaning there is a difference between the saturation values for the pretest and posttest.

So it can also be concluded that "There is an influence between the provision of Prone Position and Clapping on the Oxygen Saturation Value of respondents"

And based on the statistical output for the Pretest-Posttest secretion expenditure statistical test, it is known that Asymp.Sig (2.Tailed) has a value of 0.008, so  $p$ Value  $<0.05$  so it can be concluded that "Ha is accepted" meaning there is a difference between secretion expenditure for the pretest and posttest.

So it can also be concluded that "There is an influence between the provision of Prone Position and Clapping on the discharge of secretions in respondents.

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