

# The Effects of High Fowler and Orthopneic Position in Lung Ventilation; A Quantitative-Experimental Study

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**Abstract:** COPD is lung chronic disease with obstruction of air flowing characteristic which is nonreversible progressively and reversible partial with lung inflammation response to the dangerous particle in the air. This research aims to understand the effect of High Fowler and Orthopneic Position Significantly to the function of lung ventilation of clients with COPD in Internist ward of Labuang Baji Hospital 2014. This research is a quantitative research with experimental method (Quasi-Experiment) by pre test-post test group design. Sample of this research are clients with COPD who are attending in Internist ward of Labuang Baji Hospital by Purposive sampling technique. The result of this research shows High Fowler and Orthopneic position influenced to decrease of respiratory rate frequency and increase the Peak Flow Expiration of the COPD clients with a significant result of High Fowler position ( $P1=0,000$ ) and  $P2=0,000$ ) and significantly result to Orthopneic Position ( $P3=0,000$  and  $P4=0,000$ ). Based on the result, I could conclude that there was influencing of High Fowler and Orthopneic position to the lung of ventilation functioning of COPD Clients in Internist Ward of Labuang Baji Hospital Makassar City. My suggestion is to the hospital and all nurses applying of High Fowler and Orthopneic Position giving care to the client with COPD in order to increase the function of lung ventilation.

**Keywords:** High Fowler, Orthopneic, Lung Ventilation, COPD

## 1. Background

COPD is one of the disease which disturbs of Oxygen need by characteristic of air flowing obstruction in respiratory tract with nonreversible progressive, reversible partial, and lung inflammation in particle and air dangerous seriously (Gold, 2005). COPD is the one cause of Morbidity and Mortality number increased in the world. WHO applied the day of COPD day is November 18. WHO predicted at early of 2020, the prevalence of COPD clients will increase from the twelve to the fifth rating in the world.

In 2002, 2004 and 2005, the number of clients with COPD in developed countries around 3,9%, 3,5% and 3,9%. In developing countries, the number of COPD around 7,6%, 7,4 and 8,1 %. The number of poor country is lower than developed and developing country such as 3,1%, 3,6% and 3,4%.

In SEAMIC health statistic 2001 shown that Bronchitic, Emphysema and Asthma are caused of the seventh grade of mortality case in Indonesia. In Survey Kesehatan Rumah Tangga (SKRT) Ministry of Health of Indonesian Republic 2002 shown that the number of COPD inside the country around 12,7%. Based on the Data of Ministry of Health of Indonesian Republic South Sulawesi Region (Makassar City), the number of clients with COPD in 2008 until 2009 is 292 cases and in 2010 is predominantly increased around 450 cases. In medical record of Labuang Baji Hospital in 2009 and 2010, there were around 120 cases and 162 cases with COPD.

## 2. Statement of the Problem

Based on the data above, I tried to formulate the question of the research "is there an effect of High Fowler and Orthopneic position to the function of lung ventilation of the

client of COPD in Internist Ward of Labuang Baji Hospital Makassar City?"

## 3. The Purpose of Study

### General Purpose

To understand the effect of High Fowler and Orthopneic position to the functioning of lung ventilation of COPD Clients.

### Specific Purpose

1. To understand the function of lung ventilation before giving High Fowler with COPD Client in Labuang Baji Hospital.
2. To understand the function of lung ventilation before giving Orthopneic with COPD Client in Labuang Baji Hospital.
3. To understand the function of lung ventilation after giving High Fowler with COPD Client in Labuang Baji Hospital.
4. To understand the function of lung ventilation after giving Orthopneic with COPD Client in Labuang Baji Hospital.
5. To understand the effectiveness to the function of lung ventilation with giving High Fowler and Orthopneic position to the clients with COPD in Labuang Baji Hospital.

## 4. Method of Research

### Research Design

This research is a quantitative research by using Quasi-Experiment with Pre and Post Test Design. This research aims to identify the effect of intervention (Sastroasmoro, 2002).

### Population and Sample

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The population in this research are client who are diagnosed by Medical of Doctor with COPD in Internist Ward of Labuang Baji Hospital around 30 of June until 18 of July 2013. Sampling technique using in this research is Purposive Sampling with Inclusive and Eksklusiv Criteria. The number of sample is this research around 15 respondents

**Legal Ethics of This Research**

- 1) Informed consent
- 2) Anonimity
- 3) Confidentiality

**Data Collecting**

- 1) Observation Paper
- 2) Peak Expiratory Flow Meter (PEF Meter)
- 3) Stopwatch, to calculate the RR of Clients

**Data Intervention**

- 1) Editing
- 2) Coding
- 3) Tabulating,
- 4) Entry data,
- 5) Cleaning data.

**Data Analysis**

- 1) Univariate Analisis
- 2) Bivariate Analisis

It is used to each variable with using Paired Sample t Test by  $\alpha = 0,05$  or 5% Margin Error. Hypotesis Alternative will be accepted if  $p < \alpha = 0,05$  by using software SPSS versi 11.5

**5. Result**

**Univariate Analisis**

Sample distribution based of Demographic Characteristic (Sex, Age, Height and Weight).

**Table 1:** Sample distribution based on sex in internist ward of Labuang Baji Hospital

Characteristic	F	%
Male	10	66,7
Female	5	33,3
<b>Total (Σ)</b>	20	100

Source: Primary Data, Juni-Juli 2013

Based on the table 1 above, we could understand the sample distribution based on sex such us male around 10 people (66,7%) and female around 5 people (33,3%).

**Table 2:** Sample distribution based on age in internist ward of Labuang Baji Hospital

Characteristic	F	%
Age (year)		
30-40	4	26,7
41-50	5	33,3
51-60	5	33,3
>60	1	6,7
<b>Total (Σ)</b>	15	100

Source: Primary Data, June-July 2013

Table above shows sample distribution based on age with predominantly age between 41-50 and 50 60 years old about

5 each (66,6%). Then age between 30-40 are 4 people (26,7%) and age more than 60 years is only 1 person (6,7%).

**Table 3:** Sample distribution based on age in internist ward of Labuang Baji Hospital

Characteristic	F	%
Weight (Kg)		
40-45	4	26,7
46-50	10	66,7
51-55	1	6,7
<b>Total (Σ)</b>	15	100

Source: Primary Data, June-July 2013

Based on table 3 above, we could explain that weight sample between 46-50 kg around 10 people (66,7%), 40 to 45 kg are 4 people (26,7%) and 51 to 55 kg is only one (6,7%).

**Table 4:** Sample distribution based on age in internist ward of Labuang Baji Hospital

Characteristic	F	%
Height (Cm)		
150-155	3	20,0
156-160	11	73,3
161-170	1	6,7
<b>Total (Σ)</b>	15	100

Source: Primary Data, June-July 2013

Based on table 3 above, we could explain that height sample between 156 to 160Cm around 11 people (73,3%), 150 to 155 Cm are 3 people (20,0%) and 161 to 170 Cm is only one (6,7%).

**Bivariate Analysis**

It is used to see the effect of Highfowler and Orthopneic Position to the function of lung ventilation to the client with COPD in Internist Ward of Labuang Baji Hospital Makassar.

**Table 5:** Sample distribution client with COPD based on the number of Respiratory Rate (Pre-Post Giving High Fowler Position) in internist ward of Labuang Baji Hospital.

Respiratory Rate (High fowler)								Total	
Pre				Post					
Normal		apnea		Normal		apnea		n	%
n	%	n	%	n	%	n	%		
0	0	10	66,7	3	20,0	7	46,7	10	66,7
0	0	5	33,3	4	26,7	1	6,7	5	33,3
0	0	15	100	7	46,7	8	53,3	15	100

Source: Primary Data, June-July 2013  $p_1=0,000$

Based on table 5 Above, we could say that the number of sample who under supervising around 15 samples. 10 sample with male sex (66,7%) and 5 sample as female (33,3%) with apnea condition. After giving intervention by High Fowler Positioning 3 males show normal respiratory rate (20,0%) and 7 males show still in apnea (46,7%). Female sample show normal respiratory rate around 4 (26,7%) and only one sample who is still in apnea condition (6,7%).

**Table 6:** Sample distribution client with COPD based on Peak Flowing Expiration (Pre-Post Giving High Fowler Position) in internist ward of Labuang Baji Hospital.

Value of PFE ( <i>High fowler</i> )								Total	
Pre				Post					
Well Ventilation		Bad Ventilation		Well Ventilation		Bad Ventilation			
n	%	n	%	n	%	n	%	n	%
0	0	10	66,7	6	40,0	4	26,7	10	66,7
0	0	5	33,3	3	20,0	2	13,3	5	33,3
0	0	15	100	9	60,0	6	40,0	15	100

Source: Primary Data, June-July 2013  $p_2=0,000$

Based on table 5 Above, we could say that the number of sample who under supervising around 15 samples. 6 samples (40,0%) who are males showing well ventilation and 4 samples are still bad ventilation (26,7%). In another side, 4 samples who are females after giving High Fowler positioning showing 4 samples in well ventilation (20,0%) and 3 females are bad ventilation (13,3%).

**Table 7:** Sample distribution client with COPD based on Observation (Pre-Post Orthopneic Position) in internist ward of Labuang Baji Hospital

Respiratory Rate ( <i>Orthopneic</i> )								Total	
Pre				Post					
Normal		Apnea		Normal		Apnea			
n	%	n	%	n	%	n	%	n	%
0	0	10	66,7	5	33,3	5	33,3	10	66,7
0	0	5	33,3	4	26,7	1	6,7	5	33,3
0	0	15	100	9	60,0	6	40,0	15	100

Source: Primary Data, June-July 2013  $p_3=0,000$

Based on the table 7 above, it is explaining that after giving intervention with orthopneic Positioning around 5 samples who are male showing 5 samples with normal respiratory rate ( 33,3%) and 5 samples with still in apnea respiratory (33,3%). In female samples after giving Orthopneic positioning 4 samples are showing in well respiratory rate ( 26,7%) and 1 sample is still in bad respiratory rate.

**Table 8:** Sample distribution client with COPD based on PFE (Pre-Post Orthopneic Position) in internist ward of Labuang Baji Hospital

Peak Flowing Expiration ( <i>Orthopneic</i> )								Total	
Pre				Post					
Well Ventilation		Bad Ventilation		Well Ventilation		Bad ventilation			
n	%	n	%	n	%	n	%	n	%
0	0	10	66,7	6	40,0	4	26,7	10	66,7
0	0	5	33,3	4	26,7	1	6,7	5	33,3
0	0	15	100	10	66,7	5	33,3	15	100

Source: Primary Data, June-July 2013  $p_4=0,000$

Based on the table 8 above, 6 samples (40,0%) who are males after having intervention with orthopneic positioning has well ventilation and 4 samples (26,7%) have bad ventilation. In another side, 4 females samples ( 26,0%) have well ventilation and only one has bad ventilation after intervention (6,7%).

**Table 9:** Influenced of Highfowler Position to the Function of Lung Ventilation of Client with COPD in Internist Ward of Labuang Baji Hospital

Highfowler	Pre Test	Post Test	Changed	Sig.
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Position	Mean	Mean	Mean	T	
Respiratory Rate	22,33	21,13	1,20	8,290	0,000
PFE	429,27	448,13	-18,87	-6,932	0,000

Source: Primary Data, June-July 2013  $p_1=0,000$  &  $p_2=0,000$

Based on the Table 9 above shows the mean of Respiratory Rate pra intervention around 22,33 and post intervention around 21,13. In other side, the grade of Peak Flowing Expiration pra intervention 429,27 L/Minutes and Post Intervention 448,13. The mean of respiratory rate changing is around 1,20 and grade of Peak Flowing Expiration is - 18,86. The number of respiratory rate counted around  $t_{hit1} = 8,290$  and PER is  $t_{hit2} = -6,932$ . Based on SPSS output was understood grade by  $t_{hit} > t_{tab}$  with  $t_{tab} = 1,761$ . In order to see the significant result where  $p_1=0,000$  &  $p_2=0,000$ . Based on that result which  $p < 0,05$  meaning to say that  $H_0$  Rejected and  $H_a$  Accepted that there was influenced of Highfowler position to Clients with COPD.

**Table 10:** Influenced of Orthopneic Position to the Function of Lung Ventilation to the client with COPD in Internist Ward of Labuang Baji Hospital

Orthopneic Position	Pre Test	Post Test	Changed		Sig.
	Mean	Mean	Mean	t	
Respiratory Rate	21,87	20,80	1,07	9,025	0,000
PFE	437,40	455,07	-17,67	-8,156	0,000

Source: Primary Data, June-July 2013  $p_3=0,000$  &  $p_4=0,000$

Based on table 10 above, mean of respiratory rate pre test around 21,87 and post test around 20,80 moreover the rate of Peak Flowing Expiration pre test 437,40 and post test 455,07. Then rate of respiratory rate changing around 1,07 and rate of Peak Flowing Expiration changing is around - 17,67. Negative sign means rate of post test more than pre test.  $T_{hit}$  is 9,025 and -8,156 and  $t_{tab} = 1,761$  so  $t_{hit} > t_{tab}$  with significant lower than 5% (0,05) where  $p_3=0,000$  &  $p_4=0,000$  ( $p < 0,05$ ). Based on the result, we could say that  $H_0$  is rejected and  $H_a$  is accepted that there was influence of Orthopneic position to the lung function to the client with COPD.

## 6. Explanation of The Study

1. The result of this study shows Highfowler and Orthopneic position influenced to decrease of respiratory rate frequency and increase the Peak Flow Expiration of the COPD Clients with a significantly result of Highfowler position ( $P_1=0,000$ ) and  $P_2=0,000$ ) and significantly result to Orthopneic Position ( $P_3=0,000$  and  $P_4=0,000$ )
2. Based on the result above, i could conclude that there was influencing of Highfowler and Orthopneic position to the lung of ventilation functioning of COPD Clients in Internist Ward of Labuang Baji Hospital Makassar City.

## 7. Discussion

This study given the real data that highfowler and orthopneic position can be used as part of nursing intervention in the

clinical area. Another side, nurses must be understand the need of the client who has COPD problem. Given a high Fowler and orthopneic position make the inspiration and expiration of the client becoming regular. The composition of the oxygen inside of the lung becoming optimum in order to decrease of lungs distress.

## 8. Suggestion

1. This study should be developed again by Qualitative research to make clear and briefly
2. Orthopneic and High Fowler position should be applied by nurses to deliver care for clients with COPD in the clinical area.
3. Orthopneic and high Fowler position should be placed it as one topic inside the subject in nursing curriculum.

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