



Original Article

Position of Fowler and Semi-fowler to Reduce of Shortness of Breath (Dyspnea) Level While Undergoing Nebulizer Therapy

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Abstract

Chronic obstruction pulmonary disease (COPD) is a lung disease that is caused due to an obstruction in a channel the airflow that much happening in Indonesia due to the high-risk factor exposure causes the onset of COPD as the habit of smoking and an unhealthy environment. Blockage in the airway that occurs in patients of COPD is usually characterized by shortness of breath. The various ways that can be done to overcome the shortness of breath are with nebulizer therapy. Nebulizer therapy action is undertaken in accordance with standard operating procedures (SPO) already determined, in the SPO mention the position at the time of the nebulizer therapy position fowler or semi fowler. This study aims to know the effectiveness of the grant the position of Fowler and semi fowler against the scale of the COPD patient shortness of breath while undergoing therapy nebulizer. Methode of this study is a quasy experiment in two groups using pre-test and post-test design. The study was conducted in General Hospital K.R.M. T Wongsonegoro Semarang with the total sample as many as 32 patients. The analysis using Mann Whitney with p-value 0.000 ($p < 0.05$) so that it can be concluded that there is a difference in the average scale of shortness of breath between fowler and semi fowler while undergoing group therapy nebulizer. The analysis showed that the position of semi fowler is more effective in lowering shortness of breath when compared to the position of fowler while undergoing therapy nebulizer. This study recommended giving the semi-fowler position to reduce dyspnea in COPD patients while undergoing Nebulizervtherapy.

INTRODUCTION

Chronic obstruction pulmonary disease (COPD) is a disease is not infectious to become a public health problem of the age of life expectancy and the increasing risk factor exposure against, such as unhealthy living habits, pollution the air especially in big cities, industrialization and the smoking habits of thought is closely connected with

the incident COPD.¹ In this current era of not just in adults only even in the case of COPD, too many have encountered on the young age groups who are already familiar with the smoke. Smoking habit either active or passive smoker is the cause of most important causal and risk factors in associate as the main onset of COPD.²

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Figures for the incidence of COPD according to the Organisation World Health (WHO) in 2012, the number of COPD sufferers reach 274 million and in the estimate increased to 400 million people in 2020, including the country of Indonesia. Figures for the incidence of COPD in Indonesia ranks fifth highest in the world, namely 7.8 million people.² In a preliminary study conducted at the provincial RSUD K.R.M. T Wongsonegoro Semarang in 2016, there are 257 cases of COPD patients with the complaint of breathlessness, particularly in internal medicine. Although the signs and symptoms of COPD vary widely ranging from asymptomatic, symptoms of mild to severe symptoms but the main complaint of the patients perceived is shortness of breath due to a blockage of the airway.

Shortness of breath (dyspnea) is the subjective feeling of clients due to difficulty breathing. Shortness of breath occurs is not just a result of a blockage in the airway but also due to the influence of several factors, one of which is the skeletal muscle function decline. In addition, the COPD patient shortness of breath also occurs due to changes in the catalog is encounter on a large airway, small airway, pulmonary and pulmonary vascular. Inflammatory cell surface infiltrated the Central airway epithelium which resulted in the change of epithelial squamous metaplasia into which causes increased mucus and cells goblet so hypersecretion respiratory tract mucus, as a result, are experiencing clogging and shortness of breath.³

One of the nursing actions that can be done to overcome the obstruction of the respiratory tract such as shortness of breath can be done with nebulizer therapy. Nebulizer therapy is a drug generally sniffs into the respiratory tract. Nebulizer therapy done because with steam therapy drug particles that enter will be broken down first into small molecules shaped steam, so expect the drug ingested will enter into the respiratory tract to the

maximum. In addition to this nebulizer therapy also provides faster onset compared to other therapies as well as giving effect to quickly restore the condition of the bronchi space.⁴

Standard operating procedures (SPO) mention that while undergoing therapy in a patient may position the nebulizer on the position of fowler or semi fowler, in the position of Fowler will eliminate pressure in the diaphragm that allows the exchange of the larger volume so launch an airway and breathe in the medication that will go to the maximum. As for the semi-fowler position, the position will be going on the withdrawal of the gravitational force of the earth so that the lungs are free to exhale and inhaled medication can enter the maximum respiratory kesaluran.⁵

The research that's been done before has the result that position semi fowler can stabilize a patient's breath pattern of pulmonary TB.⁶ The study, entitled effective semi-fowler position against a decline in the scale of breathlessness in patients with asthma to have the result that the position semi fowler can lower a patient's asthma breathlessness.⁵ Other studies also explained that after the client in the supine position, Fowler, and his third against influential tripod respiratory function.⁷ From the explanation of the supine position indicates that Fowler, semi fowler, and the influence on respiration and tripod can decrease shortness of breath in many cases unless in combine with nebulizer while undergoing therapy. As for the purpose of the research is to find out the effectiveness of the grant the position of Fowler and semi fowler against a decline in the scale of the COPD patient shortness of breath while undergoing nebulizer therapy in RSUD K.R.M.T Wongsonegoro Semarang.

METHODS

This study is quasy experiment with the design of two group pre-test and post-test,

with intervention position fowler and semi fowler while undergoing therapy for COPD nebulizer in patients who experience shortness of breath. The sample in this research is a COPD patient complaining of shortness of breath and getting a nebulizer therapy in RSUD K.R.M. T Wongsonegoro Semarang with a total of 32 respondents, sampling techniques using purposive sampling, namely the respondent on select in accordance with the criteria of inclusion and exclusion that has researchers specify. Gauge asphyxiation using MBS (Modified Borg Scale). This research was already through the clearance ethical passed by the Commission of bioetik medical research/faculty of medicine sultan Agung Islamic University in Semarang with no. 178/III/2018 bioetik/Commission. The process of research taking place from 4th week of May until the 4th week of June 2018. The data analyzed in univariate, bivariate (test, Wilcoxon test, normalcy, and Mann Whitney test).

RESULTS

Table 1
Characteristics of COPD patient.

Indicators	Group	
	Fowler	Semi-fowler
Age (mean)	57,62	58,19
Gender		
1. Male	37,5%	68,8%
2. Female	62,5%	31,3%
Educational		
1. TS	50,0%	56,2%
2. SD	43,8%	43,8%
3. SMA	6,2%	0

Result fo the study obtained the majority of respondents who experienced shortness of breath in the category after the mid-according to WHO in the Group of fowler average age 57 years and 58 years old semi fowler group, the average gender group fowler more many experienced women amounted to 62.5% and semi fowler group of more experienced by men amounted to 68.8%, with an average education no school of 50% in the Group of Fowler and 56.2% of the Group semi fowler. The results showed the existence of a difference

before and after the intervention did position at the time of nebulizer therapy can be seen in table 2

Table 2
Distribution scale of shortness of breath before and after Done Action Position Fowler And Semi fowler on when COPD Nebulizer Therapy on patients

	Min-Max	Median	SD	IQR
Pre fowler	2-7	3,00	1,365	2
Post fowler	0-3	1,00	0,834	3
Pre Semifowler	2-7	3,50	1,652	1
Post Semifowler	0-2	0,50	0,629	1

In table 2 it can be known that before a given position of Fowler inpergola mean 3.44 and after being given the position of Fowler when the nebulizer therapy mean 0.81 while in before given the position of the semi-fowler when the nebulizer therapy obtained the value of the mean 4.06 and after being given the position of the semi-fowler when the nebulizer therapy in acquired mean 0.56. The results of a test of the effectiveness of the average change in the scale of shortness of breath before and after given the position of Fowler and semi fowler when the nebulizer therapy can be seen in table 3

Table 3
Mann Whitney test with Delta Value the effectiveness of average change of scale of shortness of breath on a group of Fowler and Semi fowler while undergoing Therapy In COPD Nebulizer

Variable	Mean rank	Sum range	p
Fowler group	12,97	207,50	0,024
Semifowler group	20,03	320,50	

Mann Whitney test results showed a p-value 0.000 (p < 0.05) so that it can be concluded that there is a difference in the average scale of shortness of breath between fowler and semi-Fowler Group's position on the patient's COPD nebulizer therapy while undergoing the provincial RSUD in K.R.M. T Wongsonegoro Semarang. The analysis shows that semi fowler is more effective when compared with Fowler. This can be proved by the results of the mean rank each of the eight variables where average the biggest changes occurred in the Group of semi fowler i.e. of 20.03.

DISCUSSION

Characteristics of respondents

Of the results showed that respondents who experienced shortness of breath in the middle age category i.e. age 45 – 59 years. Research results can be concluded that patients who suffered shortness of breath are the middle age group. This happens because a person who is experiencing the aging will occur limitations of work on the chest wall caused due to liming rib joints and decreased elasticity of the lung resulting in not being able to work to the maximum.⁸

It is supported by a lot of statements stated that at the age of 55 years someone will > susceptible of developing various diseases, one of which is lung disease COPD, i.e. it is influenced by the declining immunological system when someone gets old.

Research results on 32 respondents who experienced shortness of breath in both groups noted that most gender is male 17 respondents, whereas the female gender only 15 respondents. It is associated with unhealthy living habits such as smoking which this habit more going in men compared to women.⁹ In theory, the case of COPD is caused due to smoking occur due to dangerous particles or gases from smoking tobacco which triggered an abnormal inflammatory response in the lungs. Dialveoli inflammatory response causes damage to lung tissue. Exposure to cigarette smoke that is sustainable in a long period of time can cause the onset of COPD.

Research results showed the average education level end 32 respondents who were divided into 2 groups mentioned that most of the respondents 50% i.e. no school on the Group semi fowler group and fowler amounted to 56.2%. This associate that education influences the behavior of a person. In this case, someone will behave well will keep his health if the knowledge possessed is also good. It is supported by

other research which explains that there is a relationship between knowledge of the behavior of healthy living.⁶

The difference in the scale of shortness of breath before and after done position fowler while undergoing therapy nebulizer

Results of research scale shortness of breath before the giving of the nebulizer therapy when fowler's position was 3.44 and after awarding the position of fowler while undergoing therapy nebulizer is 0.81. The results of the average position of Fowler when respondents undergo a nebulizer therapy showed decreased 2.63. Based on a test of Wilcoxon test obtained p-value 0.000 value ($p < 0.05$) which means that there is a difference of scale shortness of breath before and after the given position of the fowler while undergoing therapy in HOSPITALS K.R.M. nebulizer T Wongsonegoro Semarang. Fowler's position is a position where the head is elevated 900 that can be intervention to patients who suffered shortness of breath because at position fowler will help eliminate pressure in the diaphragm that allows the exchange of the larger volume from the air. What if the position is at the combine with a diaphragm pressure nebulizer therapy there is no particle inhaled medications will ease the most into the respiratory tract (Barbara, 2009).¹⁰

The difference in the scale of shortness of breath before and after done position while undergoing therapy semi fowler nebulizer

Results of research scale asphyxiation rata-rata prior position semi fowler nebulizer therapy moment are 4.06 and after position semi fowler nebulizer therapy moment is 0.56. The results of the average value of the position of the semi-fowler while undergoing therapy nebulizer demonstrating a decrease of 3.50.

The semi-fowler position is a position by elevating the head 45°, the position is usually given to patients who experience shortness of breath. On the position of the semi, Fowler will happen to Earth's gravitational force withdrawal draws the diaphragm downwards so that it can degrade O₂ consumption and can maximize the pulmonary ekstasis.¹⁰ Diaphragm muscles located at the position of 45 degrees will allow the muscles to contract the thoracic cavity volume enlarge by adding the length of its vertical bar. The thoracic cavity is enlarged will create pressure on the thoracic cavity expands and forces the lungs also expands. Process vents that increased carbon dioxide will increase spending and increase the oxygen into the alveoli, oxygen inhaled will help attract drug particle respiratory to entry so join the Croup can be reduced.¹¹

The effectiveness of position of Fowler and semi fowler against the scale of the COPD patient shortness of breath while undergoing nebulizer therapy

The research shows there is a difference in scale shortness of breath before and after was given the position of the fowler and semi fowler COPD patients while undergoing therapy nebulizer. The results of such research give an overview that respondents are in the position the fowler and semi fowler nebulizer therapy can reduce the time scale of the COPD patient shortness of breath.

Nebulizer therapy is therapeutic steam by entering the drug directly into the respiratory tract so that it can reduce shortness of breath. Nebulizer therapy action there are two positions that are able to decrease shortness of breath that is the position of Fowler and the position of the semi-fowler.

The results of research conducted by Mann Whitney test with delta value retrieved results p-value 0.000 ($p < 0.05$) which means that there is a difference of position

fowler and semi fowler against the scale of the COPD patient shortness of breath while undergoing nebulizer therapy in RSUD K.R.M. T Wongsonegoro Semarang. The analysis shows that the position of semi fowler decreases more effective in COPD patient shortness of breath while undergoing therapy nebulizer. This is evidenced by the value of the mean rank position semi fowler shows greater value i.e. 20.03.

The limitations of the research

There are limitations in this study i.e., researchers can not categorize the breathlessness of the respondents based on factors that affect the shortness of breath. Researchers simply choose the respondent in accordance with the criteria of inclusion of already defined and concentrates on the respondents who experienced shortness of breath and live the nebulizer therapy. Researchers cannot control its homogeneity the age at which respondents age is an important factor which contributed to the scale of shortness of breath.

CONCLUSION

Results of the study are expected to provide information for the hospital and can be intervention to the patients about the best position when giving nebulizer therapy to reduce shortness of breath, have a contribution for the researchers to add science knowledge and apply the knowledge obtained in the learning process, and can add insight and knowledge of the public about the best position can be done to reduce shortness of breath especially patients undergoing therapy nebulizer.

CONFLICTS OF INTEREST

The author declares that none of them had any conflict of interests.

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