

The Effect of Semi Fowler Position on the Stability of Breathing among Asthma Patients at Ratu Zalecha Hospital Martapura

1st Insana Maria

Adult Health Nursing Department
STIKES Intan Martapura
South Kalimantan, Indonesia
maria.insana82@gmail.com

2nd Asni Hasaini

Adult Health Nursing Department
STIKES Intan Martapura
South Kalimantan, Indonesia
asnihasaini87@gmail.com

3rd Agianto

Adult Health Nursing Departement
School of Nurisng Universitas
Lambung Mangkurat
South Kalimantan, Indonesia
agianto@ulm.ac.id

Abstract- The case of asthma in South Kalimantan exceeds the national number (3,6% of 2,4%). The increasing of this case certainly requires rapid treatment so that airway obstruction does not occur suddenly and unexpectedly. Giving a semi fowler position, as one of the independent nursing interventions, can reduce tightness because it can reduce the pressure on the abdomen and optimize the lung function. The purpose of this study was to determine the effect of giving the semi-fowler position to the stability of the breathings of asthma patients at Ratu Zalecha Hospital Martapura. This study used a pre-experimental study design with 30 respondents, using simple random sampling technique. The intervention of semi-fowler position was given to the respondents when they were having shorthness of breathing, and observation sheets were used to assess the stability of the breathing before and after the intervention was given. The Wilcoxon test was used for analysis with alpha 0,05. To result showed that the semi fowler position affected the stability of the breathing of asthma patients (0,00). The independent intervention of nurses with the provision of positions to asthma patients turned out to be very effective as one of non-pharmacological interventions.

Keywords: *semi fowler, stability of breathing pattern, asthma, nursing intervention*

INTRODUCTION

Asthma has been known as shorthness of breathing that arises suddenly and unpredictably for a long time in the community. It is characterized by intermittent bronchial attacks that caused by allergic or irritating stimuli. There are typical symptoms that occur in asthma including wheezing, coughing, and shorthness of breathing. Nursing intervention is needed to reduce the symptoms of asthma, and semi fowler position is one of the independent interventions that can maximize lung expansion, reduce the abdominal pressure, and provide an effective airway[5]. Semi fowler position is giving a position with a slope of 30-45° of bed[5]. Semi-fowler position can be given to patients with asthma who experience impaired gas exchange, ineffective airway, and changes in breathing patterns. The goal of this intervention is to reduce O₂ consumption, maximize lung expansion, and provide the patient comfort[8].

Data from The Global Asthma Report (2016) stated that the estimated number of people with asthma worldwide is 325 million people, with prevalence rates continuing to increase, especially in children. Basic Health Research Riskesdas, 2018 reported that the prevalence of asthma in Indonesia was 2,4%[7]. There are 19 provinces from the asthma prevalence that exceeds the national rate, and one of them is South Kalimantan (3,6%). According to Banjar District Health Profile (2017), there were 998 people of asthma.

Based on Arifian's research (2018), it was found that there was an effect of giving a semi fowler position to the respiration rate in bronchial asthma patients at the Ketapang Air Upas Health Center. The frequency of breathing identified after being given a semi fowler position was mostly included in the normal breathing frequency, and there was the effect of giving a semi-fowler position to the stability of to breathings in pulmonary TB patients ward of Prof. Dr. R. D. Kandou Manado Hospital[3].

Nursing interventions are not given optimally to patients who have respiratory problems in asthma patients during treatment. The non-pharmacological intervention is very important given by nurses to patients by semi-fowlers position to stabilize breathing experienced by asthma patients. According to Maslow, a psychology reporter said that basic physiological needs must be fulfilled. Someone who has respiratory problems like those with asthma patients really needs adequate O₂ [6]. This needs to be realized by nurses where in addition to the collaboration in giving O₂, nurses can also provide independent nursing intervention by semi fowler position to reduce the dependence of O₂ consumption and corticosteroid inhalation as well as to optimize the lung expansion, to provide the patency airway, and to maintain the convenience[5].

METHOD

This study was a pre-experimental with one-group pre-post test design by expressing a causal relationship by involving one group of asthma patients. Asthma patients were observed before giving a semi fowler position, then re-observed after the intervention. This research was conducted at the Ratu Zalecha General Hospital Martapura with 30 asthma patients using simple random sampling. The

inclusion criteria were patients with asthma who experienced shortness (RR> 24 x / minute), patients with full awareness, 7-8 hours after administration of ventolin therapy. The exclusion criterias were un-cooperative patients, patients who had O₂ therapy, patients who got corticosterides therapy. Semi-fowler positions were given to respondents when they experienced shorthness of breathing for 15 minutes, and used the observation sheet to assess the stability of to breathings before and after the intervention was given. The steps of giving a semi fowler position were washing hands, lying the patient on supine, and raising the head of bed 30-45°, after that putting the patient's head on a mattress or a very small pillow, used a pillow to support the hand and the patient's arm if the patient did not have voluntary control or using the arm, then placed the pillow on the patient's lower back, placed a small pillow or roll of towel under the patient's thigh (if the patient's lower extremity had paralysis or unable to control the lower extremity), used a roll trochanter in addition to an additional pillow under the pelvis and placed a small pillow or roll of towel under the ankle and placed the foot board at the base of the patient's foot. After that removed the gloves and washed the nurses' hands. Mean, median, mode, maximum value, minimum value, standard deviation, as well as Wilcoxon statistical test were used to analyze the study result.

RESULT

The result of the study is shown in these tables for respondent characteristics and the effect of the intervention.

Table 1. Respondent characteristics of Asthma Patients at Ratu Zalecha General Hospital Martapura in 2019 (n=30)

Characteristic	Frequency	Percentage
<i>Sex:</i>		
Male	22	73.3
Female	8	26.7
<i>Age:</i>		
31-40 years old	8	26.7
41-50 years old	14	46.7
51-60 years old	8	26.7
<i>Level of education:</i>		
Elementary	14	46.7
Junior high school	8	26.7
Senior high school	8	26.7
<i>Occupation:</i>		
Farmer	12	40.0
Entrepreneur	10	33.3
Private	6	20.0
Others	2	6.7

*primary data source, 2018

Based on the results of table 1 above, it was found that the highest sex among asthma patients in Ratu Zalecha Hospital was male, which was 22 people (73,3%), the mostly age was 41-50 years as many as 14 people (46,7%), the highest level of education was 14 elementary schools (46,7%), and the occupations were mostly 12 farmers (40%).

Table 2. Frequency of Breathing before Performing Semi-Fowler Position among Asthma Patients at Ratu Zalecha Hospital Martapura in 2019 (n=30)

Mean	Median	Max	Min	Standard Deviation
28.63	29	32	26	2.042

*primary data source, 2018

Based on table 2, the average of breathing among asthmatic patients before the semi fowler position was given is 28,63x/min in the tightness category, a median is 29x/min, a maximum values 32x/min, a minimum value is 26x/min, and the standard deviation is 2,042.

Table 3. Breath Frequency After Performing Semi Fowler Position among Asthma Patients at Ratu Zalecha Martapura General Hospital in 2019(n=30)

Mean	Median	Max	Min	Standard Deviation
21.19	22.5	25	18	2.369

*primary data source, 2018

Based on table 3, breath frequency in asthmatic patients after the semi fowler position was given is 21,19 x/min which is in no shortness category of breath frequency within the normal range, with a mean value of 22,5 x/min, maximum value 24x/min, a minimum value of 24x/min, and a standard deviation of 2,369.

The results of the normality test obtained the value of Shapiro Wilk Pre and Post Group <0.05. It can be concluded that the data was abnormally distributed, and it was performed statistical tests using the Wilcoxon test.

Table 4. Effect of Before and After Semi Fowler Position Intervention on Stability of To breathing in Asthma Patients at Ratu Zalecha Martapura Hospital in 2019 (n=30)

	n	Median
Before	30	29 (26-32)
After	30	22,5 (18-24)

*primary data source, 2018

Based on table 4. there are differences in the frequency of breath before and after being given a semi fowler position in 30 respondents obtained median (minimum-maximum) breath frequency before being given a semi fowler position. It is 29 (26-32), as for the median (minimum-maximum) and after semi fowler position intervention, the median of breath

frequency is 22,5 (18-24). There was a significant effect between before and after of giving semi-fowler position to the stability of to breathings in asthma patients at Ratu Zalecha Martapura Hospital (0,000).

DISCUSSION

Based on the frequency distribution of respondents before being given a semi-fowler position on the stability of to breathings in asthma patients, the average respiratory frequency was 29 x/min, which was categorized as shortness. This is because in asthma sufferers, there is a narrowing of the airways due to hyperactivity of a particular stimulus, which causes inflammation, and this narrowing is temporary.

Asthma patients with the release of mast cell products (called mediators) such as histamine, bradikinin, prostaglandin, and anaphylaxis from substances react slowly[10]. The releasing of this mediator in lung tissue affects to smooth muscle and airway glands, bronchospasm, mucous membrane swelling, and mucus formation which is very much a distal blockage and results in progressive hyperinflation of the lung. Moreover, the patient tries to force the air out and is followed by a productive cough with whitish sputum[10].

The result of respondents after being given a semi fowler position on the stability of to breathings in asthma patients were on average at 20x /min, which was categorized as breathing within normal limits. Decreasing in respiratory frequency is because there are several factors that affect. The majority of respondents are men, 22 people (73,3%), most respondents are 41-50 years old as many as 14 people (46,7%). Level of education in asthmapients is mostly elementary school, 14 people (46,7%), and the majority of occupation is as farmers, 12 people (40%).

This is in line with Majampoh's research (2013) that 22 male patients (55%) was more numerous than women. Men have a higher risk of asthma than women. It is related that men tend to smoke and consume alcohol. They can reduce the body's defense system and are more easily exposed to the agents that cause asthma. Smokers and drinkers have macrophage disorders and increase airway resistance[5]. In this study there were more men than women. Men tend to have unhealthy lifestyles such as smoking, drinking alcohol, drinking coffee, rarely exercising. Furthermore they tend to be at risk of developing asthma.

The results of this study are also in line with Safitri's research (2011), which shows that the age of respondents, aged 41-50 years, was 22 respondents (33%). People who work in industrial environments, factories, traffic police have a tendency to suffer from asthma[9]. These trigger factors cause a genetic predisposition to allergies, and people who work for years are susceptible to asthma. The results of this study support the theory of Guyton and Hall (2014), as well as Hudak and Gallo (2015), mentioned that the older a person is, the more his parental function will decline. This is due to the decrease chest wall elasticity. During the aging process, there is a decrease in the elasticity of the alveoli, thickening of the bronchial glands, decreased

lung capacity and an increase in the amount of loss. This change causes a decrease in oxygen diffusion capacity. In this study, the majority of adults are older. People with aging will be more susceptible to various diseases such as lung disease due to the weakening body condition and decreased immune system. [1][2] and then result Winslow etc showed that the semi-fowler position was suitable for patients with bilateral pulmonary disease as measured using pulse oximetry[14].

Results of this study are in line with Majampoh's research (2013), which shows that the most dominant education is elementary school (27,5%). Based on the research, it is explained that there is a relationship between knowledge and the behavior of a healthy life. In this case, someone has a good action if the knowledge is good. The low level of education will affect a person to live an unhealthy life due to lack of health-related information and how to prevent lung disease.

The results of this study are not in line with the theory. The respondents were mostly farmers who had the possibility of exposure to environmental factors in the working area. Although the results of the study stated that work factors are not related to the occurrence of asthma, but it is a trigger to remain a risk for asthma attacks in sensitive people.

Result of the study showed that the data were not normally distributed after data transformation, and researchers used an alternative statistic analysis, the Wilcoxon test ($p = 0.000$). It means that there is a significant effect between the giving of semi fowler position to the stability of to breathings in asthma patients at Ratu Zalecha Martapura Regional Hospital in 2019.

Semi fowler position with a degree of slope of 45°, can use gravitational forces to assist in developing the lungs and reduce abdominal pressure in the diaphragm. This is in line with the results of Kim's research (2004) in giving the semi-fowler position to reduce shortness of breathing in asthma patients³, and result of Badr, etc (2002) about obstructive nature of bronchial asthma affects the volume of the lungs. In general, if the supine position causes the ability to produce higher lung function is reduced[12], on the contrary the semi-Fowler position can make expiratory pressure and flow rate increase[13]. Supadi et al. (2008) pointed out that the semi-fowler position where the head and body are raised 45° makes oxygen in the lungs increase so that the breathing difficulty is reduced. The decrease in shortness of breathing is supported also by the attitude of patients who are cooperative, obedient when given a semi fowler position. The results of these differences indicate there is an effect of giving semi fowler position to shortness of breathing[11].

CONCLUSION

Before giving a semi-fowler position to the stability of the to breathing among asthma patients atRatu Zalecha Martapura Hospital is in the tightness category (29 x/min). After giving a semi-fowler position is the average respiratory frequency (20 x/min).There is the effect of giving a semi fowler position to the stability of the to breathing in asthmatic patients.

RECOMMENDATION

Recommendations for further study isto conduct a study that measure SPO2, nostrils, chest wall retraction, and cyanosis in the stability of to breathings observing.

REFERENCES

- [1] Guyton, A. C., Hall, J. E., 2014. *Medical Physiology Textbook. 12th Edition*. Jakarta : EGC
- [2] Hudak & Gallo, 2012. *Critical Nursing: Holistic Care Approach Vol 1*. Jakarta: EGC.
- [3] Kim, K. 2004. *The Effects of Semi Fowler's on Post Operative Recovery In Recovery Room for Patients with Laparoscopic Abdominal Surgery. Abstract*. College of Nursing, Catholic University of Pusan, Korea.
- [4] Majampoh Aneci B, DKK. 2013. *The Effect of Giving Semi Fowler's Position on the Breath Pattern Stability in Lung TB Patients in Irina C5 Prof. Dr. D. Kandou Manado*. E-Journal Keperawatan 3(1).
- [5] Manurung Nixson. 2016. *Application of Nursing Respiratory System Nursing*. Jakarta: Trans Info Medika.
- [6] Nursalam. 2015. *Nursing Science Research Methodology. 4th edition*. Jakarta: Salemba Medika.
- [7] RISKESDAS. *Basic Health Research (RISKESDAS) 2018*.
- [8] Ritianingsih N dan Nurhayati F. 2017. *Duration associated with Quality of Life Patients with Chronic Obstructive Pulmonary Disease (COPD)*. Jurnal Kesehatan Bakti Tunas Husada 17 (1): 133-138.
- [9] Safitri, Refi & Andriyani, Annisa. 2011. *The effectiveness of giving a semi-fowler position to the reduction of tightness in Class III Inpatient Hospital Dr. Moewardi Surakarta*. STIKES Aisyiyah Surakarta. GASTER, Vol.8, No.2.
- [10] Smeltzer& Bare. 2010. *Surgical Medical Nursing Textbook. Issue 2*. Jakarta: EGC.
- [11] Supadi, E. Nurachmah, dan Mamnuah. 2008. *Relationship Analysis of Semi Fowler Sleeping Position with Sleep Quality in Heart Failure Clients in Banyumas Central Java Hospital*. Jurnal Kebidanan dan Keperawatan Volume IV No 2.
- [12] Badr, C, Elkins, MR Ellis, ER. *The effect of body position on maximal expiratory pressure and flow*. Australian Journal of Physiotherapy, 2002; 48 (2),95-102
- [13] Naitoh, S, Tomita, K, Sakai, K, Yamasaki, A, Yuji K, Shimizu, E. *Effects of Body Position on Lung Function, Chest Wall Motion, and Discomfort in Healthy Young Participants*. Journal of Manipulative and Physiological Therapy. 2014; 37: 9, 719-725
- [14] Dean, E. (2014). *Effect of Body Position on Pulmonary Function*. Journal of American Physical Therapy.