Original Article

Combination of Tripod Position and Pursed Lip Breathing to Reduce Shortness of Breathing in Patients with Respiratory System Disorders

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ABSTRACT

Background: *Shortness of breath that is not treated immediately will result in several other health problems and threaten death. There are non-pharmacological treatments, namely tripod position techniques and pursed lip breathing. To determine the effectiveness of tripod position and pursed lip breathing on reducing shortness of breath in patients with impaired systems and respiration.*

Methods: *The study design used in this case study is based on evidence-based practice of nursing (EBN) with sampling according to inclusion criteria of 5 respondents—ameasuring instrument used for the assessment of shortness of breath using oxygen saturation observation sheets. Respondents' intervention used SOPs for tripod position and pursed lip breathing.*

Results: *Based on interventions that have been performed on patients, most oxygen saturation < 95% to 80%. Then, after the intervention, there was an increase in oxygen saturation to 96-100% as much as 100%, from the results of the spss test using the Wilcoxon test, p values (0.04) < (0.05) were obtained, which means that there is an effect of the application of tripod position and pursed lip breathing on reducing shortness of breath in patients.*

Conclusion: *Tripod position and pursed lip breathing techniques can reduce shortness of breath in patients. This application can be done independently for 10-15 minutes, as much as two times, to reduce shortness of breath if you experience a recurrence.*

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Introduction

Respiration is a vital channel that generates intense afferent traffic from various sources. Each breath involves contracting muscles, moving articulations, changes in intrathoracic and abdominal pressure, and expanding and contracting the bronchial tubes and lung parenchyma so that O2 and CO2 gas exchange occurs (Rahmi et al., 2023). One of the disorders that often occurs in the respiratory system is shortness of breath.

Dyspnea, or what is often referred to as shortness of breath, refers to the subjective sensation of abnormal breathing, such as

the feeling of breathing with varying intensity. Common symptoms of dyspnea may include manifestations of diseases of the respiratory system, cardiac, neuromuscular, psychogenic, systemic, or a combination of these. Dyspnea can be acute or chronic, with the acute condition occurring over a period of hours to days, while the chronic condition lasts for more than 4 to 8 weeks (Fitria et al., 2021).

Dyspnea conditions are also often experienced by patients who require palliative care, such as in cases of advanced cancer, heart failure and chronic lung disease. More than half of the deaths in the United States are caused by these three categories of disease (Fitria et al., 2021). If shortness of breath occurs continuously without being targeted, it will reduce oxygen saturation which can then cause cyanosis in patients with respiratory problems (Somantri, 2017). Non-pharmacological treatments that can reduce shortness of breath include breathing exercises, arranging a comfortable resting position, so that the additional respiratory muscles can work well.

Breathing exercises and positioning that are useful in overcoming breathing difficulties involve breathing techniques with bent lips and a tripod position. The pursed lips breathing (PLB) technique involves breathing by creating resistance through narrowing the lips. Doing breathing with this technique can improve gas exchange, as can be seen from increasing oxygen saturation in the arteries. PLB can also improve breathing patterns and increase tidal volume. In addition, PLB aims to provide subjective benefits for sufferers, such as reducing sensations of tightness, anxiety and tension caused by difficulty breathing (Devia et al., 2023).

Based on research (Djanatunisah & Dahlia, 2021)Regarding the Tripod Position to Reduce Shortness of Breath in COPD Patients: Literature Review results show that there is an effect of applying the tripod position in reducing shortness of breath. Study (Lolo & Tulak, 2019) about dThe impact of pursed lips breathing exercise on complaints of shortness of breath in COPD patientsThe results showed that there was a difference in COPD patients' complaints of shortness of breath after the PBL intervention, namely a decrease in patients' complaints of shortness of breath. Study (Ramadhani et al., 2022) regarding the application of pursed lip breathing to reduce shortness of breath in patients with chronic obstructive pulmonary disease (COPD) in the lung room of Jend General Hospital. Ahmad Yani Metro City obtained implementation results*pursed lip breathing*can help reduce shortness of breath.

Research on the application of the tripod position and pursed lips breathing exercise to the respiratory frequency and oxygen saturation of COPD patients in the Lung Room of Jendral Ahmad Yani Regional Hospital, Metro City in 2022 showed that the results of the application were carried out for 15 minutes with 3 breaks, 5 minutes each time. After 3 days of rest, shortness of breath decreased and oxygen saturation increased.

Based on the description above, the aim of this research is to find outThe effectiveness of tripod position and pursed lip breathing in reducing shortness of breath in patients with respiratory system disorders.

Methods

In writing this article, the study design used in this case study is based on evidence based practice of nursing (EBN). The following stages in implementing EBP in nursing consist of:

1. PICOT analysis

Consists of several journals that have been obtained

2. Article Search Method

Article searches using several journal databases.

3. Article Analysis

From the 20 journals that have been obtained and have been reviewed, the results show that the application of tripod position and pursed lip breathing reduces shortness of breath in patients with respiratory system disorders for 10-15 minutes twice a day until the patient does not experience shortness of breath. The measuring instrument used is an oxygen saturation observation sheet.

4. EBN implementation
   a. Monitor the condition of patients who experience shortness of breath
   b. Teaching tripod position and pursed lip breathing until the patient does it independently and complaints of shortness of breath decrease
   c. *Carrying out evaluations after the intervention is carried out*
   d. *Suggesting activities while at home using booklet media*

e. EBN Evaluation

The results of the evaluation of the application of tripod position and pursed lip breathing were an increase in oxygen saturation as an indicator of shortness of breath.

Respondents in this EBN practice were 5 people who met the respondent criteria using accidental sampling techniques. The sample for implementing EBN consisted of inpatients who experienced respiratory system disorders at the Surabaya A. Yani Islamic Hospital, with the respondent criteria being:

a. The patient is willing to be a respondent
b. Patients who experience respiratory system disorders at the Surabaya A. Yani Islamic Hospital
c. Patients follow the EBN until completion
d. Patients aged 30 – 64 years
e. The patient did not experience hearing loss
f. The patient did not experience loss of consciousness

Results

Based on the interventions carried out on patients before and after the intervention, the results showed that oxygen saturation had increased. From the results of the EBN implementation, the following data was obtained:

Table 1. Characteristics of Respondents Based on Gender

Gender	n	%
Man	3	60
Woman	2	40
Total	5	100

Based on the results of the table above, it can be concluded that the majority of respondents were male, 3 people (60%).

Table 2. Characteristics of Respondents Based on Age

Age	n	%
26-35 Years	1	20
36-45 Years	2	40
46-55 Years	1	20
56-65 Years	1	20
>65 Years	0	0
Total	5	100

Based on the results of the table above, it can be concluded that the majority of respondents aged 36-45 years were 2 people (40%).

Table 3. Characteristics of Respondents Based on Education

Age	n	%
No school	0	0
Base	0	0
Intermediate	5	100
College	0	0
Total	5	100

Based on the results of the table above, it can be concluded that all respondents had

a secondary level education (SMP-SMA) as many as 5 people (100%).

Table 4. Characteristics of Respondents Based on Type of Work

Work	n	%
Housewife	2	40
Private		
Self-employed	1	20
Civil	2	40
servants/TNI/Polri	0	0
Total	5	100

Based on the results of the table above, it can be concluded that the majority of respondents are entrepreneurs and housewives, 40%.

Table 5. Results of Oxygen Saturation (SPO2) Before Intervention

Oxygen Saturation	n	%
≤95%	4	80
96-100%	1	20
Total	5	100

Based on the results of the table above, it can be concluded that the majority of respondents before the intervention had oxygen saturation <95%, as many as 4 people (80%).

Table 6. Results of Oxygen Saturation (SPO2) After Intervention

Oxygen Saturation	n	%
≤95%	0	0
96-100%	5	100
Total	5	100

Based on the results of the table above, it can be concluded that the majority of respondents after the intervention had 96-100% oxygen saturation as many as 5 people (100%).

Table 7. Tabulation Cross-section of Oxygen Saturation (SPO2) Before and After Intervention

Pre	Post		Total	
	n	%	n	%
< 95%	4	80	4	80
96-100%	1	20	1	20
Total	5	100	5	100
Wilcoxon test p value (0.04)<(0.05)				

Based on the results of cross tabulation, it can be concluded that oxygen saturation was <95% before the intervention was carried out in 4 people (80%) and after the intervention there was an increase in oxygen saturation of 96-100% in 5 people (100%). From the results of the Wilcoxon test, it was found that the p value was (0.04) < (0.05), so it could be concluded that there was an effect of applying tripod position and pursed lip breathing on decreasing oxygen saturation in patients with respiratory system disorders.

Discussion

Tripod position and pursed lip breathing techniques have been implemented in several of our practice rooms on 27-29 December 2023. Based on the interventions carried out on that date, it was found that the majority of oxygen saturation as an indicator of shortness of breath in patients experienced an increase in oxygen saturation after the intervention. . This is proven by the results of the Wilcoxon test p value (0.04) < (0.05). The results of several journals and research that have been carried out have proven that the application of a combination of tripod position and pursed lip breathing techniques can reduce shortness of breath by increasing oxygen saturation and the patient feels more relaxed. This application was carried out for 10-15 minutes twice, then we re-evaluated the oxygen saturation after carrying out the intervention.

From the results, oxygen saturation after the intervention increased to 96-100% from the previous oxygen saturation <95% so that patients felt more relaxed without using oxygen assistance.

Doing a tripod position affects the effectiveness of the inspiratory muscles and reduces shortness of breath. Difficult respiratory conditions in patients can be observed from their severity. The tripod position can increase the work of the diaphragm and external intercostal muscles

at an angle of approximately 45 degrees, so that the earth's gravitational force can work effectively. This gravitational force facilitates downward muscle contraction, expands the volume of the thoracic cavity, and forces the lungs to expand. This process shows that using a tripod or forward tilt position can help patients who are having difficulty breathing efficiently without much energy use. Carrying out inspiration with minimal energy use can reduce patient fatigue during breathing and reduce oxygen requirements (Susilowati et al., 2020).

The Pursed Lips Breathing breathing technique is a breathing exercise that aims to slow expiration, prevent lung collapse, control exhalation and increase oxygen in hemoglobin (Wigiyanti & Faradisi, 2022).

Based on research (Isnainy & Tias, 2020) Regarding the influence of the forward leaning position and pursed lips breathing therapy on the degree of shortness of breath in patients with chronic obstructive pulmonary disease (COPD), the results showed that the average position of the respiratory condition of COPD patients before being given CKD and PLB therapy was with a mean of 86.71 standard deviation 1.649 standard error 00.400 and min-max value 85-90, and after intervention the mean was 92.82 standard deviation 2.856 standard error 0.693 and min-max value 88-97. The results of statistical tests using t-dependent obtained a p value of 0.000 ($\alpha<0.05$), meaning that there is an influence of the forward leaning position and pursed lip breathing on the level of shortness of breath in COPD patients.

Study (Khasanah & Maryoto, 2016)regarding the effectiveness of the forward leaning position (CKD) and pursed lips breathing (PLB) in reducing complaints of shortness of breath in patients with chronic obstetric pulmonary disease (COPD) CKD and PLB positions carried out for 3 days are more effective in reducing complaints of shortness of breath with p-value (0.000) <α (0.05)there is influenceProviding Forward Leaning Position (CKD) and Pursed Lips Breathing (PLB) to reduce shortness of breath in COPD patients.

The weakness in this study was that patients who experienced shortness of breath also received oxygen therapy and in its implementation the researchers also found limited respondents because patients had shortness of breath in the room where we practiced. We also provide education to patients regarding the application of this technique, which can be done independently at home when experiencing a recurrence of shortness of breath.

Conclusion

Based on the results of the research that has been carried out, we can conclude that the application of a combination of tripod position and pursed lip breathing can reduce shortness of breath (increased oxygen saturation) in patients with respiratory system disorders. It is hoped that the tripod position and pursed lip breathing techniques can be used as supporting therapy to reduce shortness of breath in patients at the Surabaya A. Yani Islamic Hospital. It is hoped that the tripod position and pursed lip breathing techniques can be done independently at home if shortness of breath recurs during activities.

Authors Contributions

The manuscript reflects the collaborative efforts of the research team, where one member focused on study design and data collection, another member contributed to data analysis and interpretation, and a third member provided critical insights during manuscript preparation. All authors have provided

feedback and approved the final draft for publication.

Conflicts of Interest

We state that there are no conflicts of interest regarding the methodologies, data collection, analysis, or interpretation of results in this research, ensuring that all findings are presented impartially and accurately.

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