



Effect of self efficacy pursed lip breathing to decrease tightness and improved oxygen saturation in patients with Chronic Obstructive Pulmonary Disease (COPD)

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ABSTRACT

The main complaint most often experienced patients with Chronic Obstructive Pulmonary Disease (COPD) it was packed. One nursing interventions to increase confidence in the efforts to overcome the shortness of the COPD patient self-efficacy pursed lip breathing. This study aims to determine the effect of self-efficacy pursed lip breathing to decrease tightness and increased oxygen saturation of patients with COPD. The study design was a randomized controlled trial to study design pretest-posttest design. The study involved 36 respondents using block randomization technique respondents are divided into 18 intervention and 18 control group respondents. The results of statistical analysis showed that there were significant differences decrease tightness and increased oxygen saturation between the intervention and control groups after the intervention, with $p < 0.001$. Self efficacy pursed lip breathing can be used as an alternative airway management nursing intervention in COPD patients.

Key words: Self-efficacy, Pursed Lip Breathing, COPD

INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) was ranked 6 out of 10 most common causes of death in Indonesia. Chronic Obstructive Pulmonary Disease (COPD), a chronic respiratory disease characterized by the air flow resistance and expiratory air in particular is chronic, progressive and increasingly deteriorated and irreversible [6]. WHO estimates that by 2020 COPD will be in the order of the 3rd leading cause of death and burden on society worldwide [1]. COPD causes the symptoms of shortness of breath constantly. Tightness in COPD patients is caused by obstruction of the bronchi or bronchospasm and hyperinflation [13].

One treatment that can be done to overcome the shortness of breath that as Pursed Lip Breathing (PLB). PLB can overcome airflow limitation and impaired gas exchange in COPD [20]. Nield in a research report that PERS can reduce the use of oxygen in patients with stable COPD, so that patients with COPD are recommended for exercise PLB [11].

Results of research conducted by Tiep, Burns, Kao, Madison, and Herrera [19] about the practice pursed lip breathing (PLB) of the oxygen saturation (SaO₂) in COPD patients, suggesting that breathing exercises PLB is a useful technique to increase oxygen saturation at rest, but less effectively increase oxygen saturation during exercise. This caused a panic in the exercise PLB, and uncertainty and low confidence in doing so despite having had prior knowledge of the PLB.

Self-efficacy by Bandura [3] assessing an individual's belief in his ability to perform an action. The results of the study by Jeng et al. [8] shows that the treadmill of self-efficacy, mastery experiences as a source of proven efficacy that is more effective in improving self-efficacy through increased confidence in the study subjects at each stage of

implementation procedures treadmill. This study shows the effectiveness of self-efficacy and pursed lip breathing independently, there has been no investigation of the influence these two actions are pursed lip breathing and increase self-efficacy, if done jointly to decline tightness and increased oxygen saturation in patients with COPD.

MATERIALS AND METHODS

The study design was a randomized controlled trial pretest-posttest design with a single incognito. The subject of research conducted random allocation of blocks without concealment. This study consisted of two groups: intervention (self-efficacy pursed lip breathing, n = 18) and control group (intervention relaxation breath in, n = 18). Total sample of 36 people, the respondents did not know their status as the control group or the intervention. Data collected include the characteristics of the respondent collected using observation sheet. Data was collected using a sheet blown Modified Borg Scale (MBS) and oxygen saturation using pulse oxymeter. Data is collected in Tuban city hospital for one day with measurements on the same day, while observing the principles of ethics beneficence, respect for human dignity and justice. Analysis of the data using the Shapiro-Wilk test, lavene homogeneity test, paired t-test, Wilcoxon and Mann-Whitney.

RESULTS

Collecting data in this study has been conducted in the lung poly Hospital Dr. R. Koesma Tuban, East Java starting from 7th May to 3rd June 2015. Data characteristics included age, gender, smoking status, and nutritional status. The average age of the respondents in the intervention group is 60.89 (± 6,462) and the control group is 64.67 (± 7874). All respondents sex male ex-smoker and as many as 36 people (100%). Most respondents have a good thin nutritional status in the intervention group as many as 12 of the 18 individuals (66.6%), as well as in the control group as many as 15 of the 18 individuals (83.4%).

Table 1. Differences tightness and Oxygen Saturation Before and After Intervention on intervention group (n = 18)

| Variable | Median (Min-Max) | P |
|--------------------------|------------------|---------|
| Crowded | | |
| Before | 5.00 (4 – 7) | < 0.001 |
| After | 1.00 (1 – 3) | |
| oxygen saturation | | |
| Before | 93.50 (92 – 96) | < 0.001 |
| After | 98.0 96 – 99) | |

Table 2. Differences tightness and Oxygen Saturation Before and After Intervention In control group (n = 18)

| Variable | Mean ± SD | Median (Min-Max) | p |
|--------------------------|---------------|------------------|---------|
| Crowded | | | |
| Before | 5.33 ± 1.114 | 4.00 (4 – 7) | 0,005 |
| After | 4.17 ± 1.043 | 4.00 (3 – 7) | |
| oxygen saturation | | | |
| Before | 93,78 ± 2.102 | 93.50 (91-97) | < 0.001 |
| After | 94,94 ± 1.955 | 95.00 (92-98) | |

Table 3. Differences Decreased Tightness and Increased Oxygen Saturation After Intervention on intervention group and control group (n = 18)

| Variable | Median (Min-Max) | P |
|------------------------------------|------------------|---------|
| Decrease Shortness | | |
| Intervention | 1.00 (1 – 3) | < 0.001 |
| Control | 4.00 (3 – 7) | |
| Increased oxygen saturation | | |
| Intervention | 98.00 (96 – 99) | < 0.001 |
| Control | 95.00 (92 – 98) | |

Shortness of variable data using the Wilcoxon test showed significant differences between the tightness before intervention after intervention in the control group (p = 0.005). Oxygen saturation variable data using paired t test

showed a significant difference between oxygen saturation prior to intervention with after the intervention in the control group ($p < 0.001$). Mann-Whitney analysis results showed a decrease shortness difference between the intervention group and the control group ($p < 0.001$) the reduction in the intervention group is higher than the control group.

DISCUSSION

The results showed that the characteristics of the respondent's gender entirely male gender to either the intervention group or the control group were 36 people (100%). These results are consistent with research conducted Oga et al. ^[12] shows that all respondents are of the male sex as many as 150 people (100%). COPD risk factor is greater on male sex than women due to smoking and the risk of exposure in the workplace larger ^[15].

The results of the study the characteristics of the respondent's age data show that the average age of the respondents in the intervention group amounted to 60.89 years, and the control group of 64.67 years. This is according to research by Tel, Bilgic and Zorlu ^[18] regarding the evaluation of tightness and fatigue in COPD patients found that the average age of respondents was 66 years with 58.7% belong to the age group ≥ 65 years. COPD patients who undergo the aging or the aging factor. will undergo physiological changes in the body, where there is a physical limitation bodily function decreases even worsened ^[16].

Characteristics of respondents to smoking status data either the intervention group or the control group showed that all are ex smoker as many as 36 people (100%). The results of this study are also consistent with studies Oga et al. ^[12] shows that all respondents 150 respondents (100%) had a history of smoking. Disease COPD is a lung disease characterized by airflow in the respiratory tract that are due to pulmonary inflammatory response against particles or gases are toxic and dangerous. Cigarette smoke is a major risk factor that causes chronic inflammation due to exposure in the long term. Nicotine in cigarettes causes lung constriction of the terminal bronchioles, thereby increasing the flow resistance of air into and out of the lungs ^[7].

The results of the study the characteristics of the respondent's nutritional status data indicates that most have thin nutritional status, in which the intervention group as many as 12 people (66.6%) and the control group of 15 people (83.4%). The results are consistent with research Sahebjami et al. ^[17] where the severity of shortness significantly larger occur in COPD patients with underweight group compared with the normal weight group. This is consistent with the theory that COPD patients with malnutrition or weight decreases negatively affect the structure, elasticity, lung function, strength, and endurance respiratory muscle, lung immune defense mechanisms and regulation of breathing ^[5].

Shortness of COPD patients in the control group and the intervention alike fell, but the decline in the intervention group declining more than in the control group. Although the two groups were down, but with the addition of self-efficacy intervention pursed lip breathing, decreased more crowded. Statistical test results also show that the tightness after pursed lip breathing self-efficacy intervention group was significantly different with the control group. The above results support research Jeng et al. ^[8] where the provision of self-efficacy treadmill able to reduce tightness to a mild degree, as well as the respondents have high confidence to keep exercise treadmill regularly. The results of this study reinforce the research conducted by Nield et al. ^[11] indicates that the group given exercise lowers pursed lip breathing more crowded than the intervention group were given training with expiratory muscle training and the control group in patients with dyspnea.

Self-efficacy beliefs a person's success to its ability to organize and carry out an action that is to be achieved ^[3]. Efikasi diri dibentuk melalui 4 proses yakni proses kognitif, proses motivasional, proses afektif, dan proses seleksi sepanjang kehidupan ^[4]. The initial process of formation of self-efficacy is through patterns of thought or cognitive functions of individuals. The memory of pursed lip breathing exercises are powerful because to do so repeatedly by 5 cycles within a period of 15 minutes then by itself will improve the ability to process memory pursed lip breathing so it will show strong confidence. After learning about the pursed lip breathing, then the next will be formed motivations. Researchers provide motivation or encouragement to the respondents continuously to exercise pursed lip breathing. In addition, the researchers provide positive reinforcement to the respondents who successfully demonstrated the technique properly.

Affective process helped shape the self-confidence, due to circumstances and pressures experienced by the individual. For those respondents who feel confident to take action pursed lip breathing, because it is able to control the stress and anxiety experienced. Researchers gave the opportunity to the respondent to disclose the barriers experienced when demonstrating techniques pursed lip breathing. The selection process is the last stage of the formation of self-efficacy. In this selection process, the individual will have a tendency to avoid certain activities or situations beyond his ability because they are not sure to handle the situation. Instead people will not avoid it if you feel confident to do so. In this study, researchers gave the opportunity for patients to express their feelings after doing pursed lip breathing. Patients said that they feel very comfortable because of tightness perceived reduced.

Mechanical inspiration and expiration on the PLB can prevent the melting of the diaphragm. Diaphragm operation is not effective in COPD condition, associated with respiratory failure or hyperinflation. Hyperinflation cause additional respiratory effort through the muscles of a respirator. With the inspiratory and expiratory breathing technique PLB, then the movement of the diaphragm muscle can reduce the use of a respirator. Ventilation be better controlled so that the decline tightness in COPD patients can be achieved ^[20].

Oxygen saturation COPD patients in the control group and the intervention both up, but the increase in the intervention group was higher than in the control group. Statistical test results also show that the oxygen saturation after pursed lip breathing self-efficacy intervention group also significantly different from the control group. The results support the research conducted by Avanj and Hajbaghery ^[2] that pursed lip breathing exercise if done regularly can increase oxygen saturation. Alveolar ventilation is improved through techniques PLB will happen O₂ bond with hemoglobin in adequate perfusion, marked by an increase in oxygen saturation.

After knowing the benefits of implementation of self-efficacy pursed lip breathing, hence the need for the implementation of such action in COPD patients either in hospital or at home. The results of this study can be used as a scholarly foundation for further research. Obstacles that be a limitation in this research was the respondents are often distracted by the environment in the room because of the poly which is not conducive. This is because there is no room for research, so communication is often hampered because respondents often less heard of guidance from researchers. To the researchers in communicating with the respondents, slowly, repeatedly, with more raised her voice but without shouting, and involving family members to facilitate the communication process. Another limitation in this study were researchers conducted random allocation technique without concealment, research time is only 30 to 60 minutes so it can not evaluate the efficacy of the patient at home. Once the research is complete responder control group were given an explanation of the self-efficacy pursed lip breathing through leaflets without practicing the appropriate procedures performed in the intervention group. Parameters measured using a scale of just claustrophobic borg and oxygen saturation, without measuring respiratory rate, heart rate, tidal volume, and hemoglobin concentration in the blood.

CONCLUSION

Self efficacy pursed lip breathing is more effective to decrease tightness and increase oxygen saturation compared with relaxation breath. For nursing services, researchers recommend the need for training and socialization of self efficacy pursed lip breathing and make it happen in nursing care standards and standard operating procedures. For patients, applying self-efficacy pursed lip breathing at home on a regular basis and assisted self motivation from family and long-term evaluation by medical personnel. For the development of nursing science, necessary to develop the knowledge of self-efficacy pursed lip breathing. In addition, the curriculum of nursing education not only teaches the implementation of pursed lip breathing technique but also how to increase self-efficacy. For further research is expected to increase the number of samples, research time is longer, provide room for research, more attention to ethical principles, and uses the random allocation concealment methods so that the implementation of self-efficacy studies pursed lip breathing is more effective.

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