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IMPLEMENTING PUBLIC EDUCATION TO IMPROVE OPTIMIZING AIRWAY CLEARANCE WITH BREATHING EXERCISE TECHNIQUES FOR ADULT PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

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ABSTRACT

The problem of ineffective airway clearance is one of the nursing issues frequently encountered in patients with pulmonary disorders; patients experience an inability to clear mucus secretions from the airway. One form of nursing intervention in addressing airway clearance issues is breathing exercise. This intervention involves educating patients on breathing techniques that are necessary for airway clearance. Based on the results of several studies, it was found that the Active Cycle of Breathing Technique (ACBT) is effective in improving lung function, as indicated by reduced sputum retention. The purpose of this community service is to provide partners with knowledge and skills about optimizing airway clearance with breathing exercise techniques for adult patients with chronic obstructive pulmonary disease (COPD). The results of the education impact test indicated that the median knowledge score before the educational intervention was 6, while the median score after the intervention increased to 8. The average difference between the pre-test and post-test knowledge scores was 2.04. The Wilcoxon test showed a p-value of 0.001 ($\alpha < 0.05$), indicating a significant effect of education on knowledge of the Active Cycle of Breathing Technique for COPD patients at the Sungai Ambawang Health Center. Thus, we can conclude that our understanding of the Active Cycle of Breathing Techniques among COPD patients at this health center has improved.

Keywords: *Education, Knowledge, ACBT, COPD.*

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INTRODUCTION

One common problem for nurses is that patients with lung diseases often struggle to clear mucus from their airways. Common complaints described by patients suffering from inefficient airway clearance include abundant mucus in the airways, ineffective coughing, and shortness of breath. (Herdman et al., 2021; PPNI, 2017). Breathing exercises are one type of nursing intervention used to address problems with airway clearance. The intervention includes teaching patients essential breathing methods for clearing their airways. (Butcher et al., 2018; PPNI, 2018). The active cycle of breathing technique (ACBT) is one type of breathing technique exercise that can maximize airway clearance. (Samir A. EL Gazar. & Nagy L. Nassif., 2020; Zisi et al., 2022). Asthma, chronic obstructive pulmonary disease (COPD), and pulmonary tuberculosis are respiratory system conditions that frequently present with complaints of sputum retention in the airways. (Lutfian & Akbar, 2019; Mukhlis & Pringsewu, 2021; Samir A. EL Gazar. & Nagy L. Nassif., 2020; Zisi et al., 2022).

According to estimates, 2.6% of Indonesians of all ages have asthma, with 57.5% of asthma patients experiencing relapses and 48.1% of school-age children experiencing them the most frequently. According to Kemenkes RI, (2018)The prevalence of pulmonary tuberculosis (TB) in Indonesia is 321 cases per 100,000 people, or 6.8% of the total population. In West Kalimantan province, asthma affects 3.19% of the population. In the Kubu Raya district, the prevalence of asthma is 2.22%, and 52.21% of asthma patients relapse. In the Kubu Raya district, the incidence of tuberculosis (TB) is 0.2% of the population, while the prevalence rate is 0.36% of the population (Riskesdas, 2018). In Indonesia, 4.8 million people suffer from COPD, and the number rises with age (Triya, 2021). According to Riskesdas (2018), 3.5% of people in West Kalimantan have COPD.

Peak Expiratory Flow (PEF) was found to be significantly impacted both before and on the third day after the Active Cycle of Breathing Technique (ACBT) intervention, according to research by Ardiansyah et al (2021) On the effect of ACBT on lung function in patients who had undergone heart surgery. Sputum buildup was lessened, and patients' difficulty in breathing scores on the Modified Borg Scale dropped from 4 to 1, showing a major improvement in patients with post-TB bronchiectasis who practiced ACBT four times. (Pratama, 2021). When compared to the Pursed Lips Breathing technique, another similar study revealed that the ACBT technique significantly improved the oxygen saturation of COPD patients. (Zuriati et al., 2020). In a related study, oxygen saturation and oxygen pressure in patients with COPD improved significantly. (Samir A. EL Gazar. & Nagy L. Nassif., 2020).

Ineffective coughing and excessive mucus production are common complaints among patients with long-term lung conditions like chronic obstructive pulmonary disease (COPD). Although expectorants have been used as pharmacological therapy for patients, breathing techniques are still required to help mobilize secretions in the airways.

Patients typically complain of shortness of breath because they do not yet know how to expel phlegm properly. It is necessary to improve the knowledge and abilities of patients with lung disorders. Patients with chronic obstructive pulmonary disease (COPD) should be able to perform breathing exercises correctly to clear mucus from the airways.

OBJECTIVES

General Purpose

The primary goal is to improve the capacity of adult patients with chronic obstructive pulmonary disease (COPD) to practice breathing strategies for airway clearing during sputum retention in the airways in Sungai Ambawang Public Health Centre.

Special Purpose

We evaluate the knowledge of the general public and COPD patients to practice breathing techniques for airway clearance during sputum retention in the airways.

PLAN OF ACTION

Strategy Plan

1. Preparation is underway to create a demonstration video for the ACBT. This includes compiling modules and materials related to Chronic Obstructive Pulmonary Disease (COPD) and techniques for clearing mucus from the airways.
2. At this stage, the coordinator and team members are working on producing videos, training materials, and modules to simulate the Active Cycle of Breathing Techniques for effective airway clearance management.
3. The community service initiative, which involves counseling, teaching, and demonstrations about COPD and the Active Cycle of Breathing Technique exercises, will commence with a briefing from the coordinator to the team members. Activities will include training and simulations of the ACBT for airway clearance management using various methods, such as lectures, demonstrations, and Q&A sessions.
4. As part of this knowledge enhancement program, both the general public and COPD patients will take a pre-test to assess their understanding of airway clearance management. A post-test will be administered after the theory and practical sessions on the topic.

Implementation

We conducted community service on August 21, 2023. The implementation of community service involved the following stages:

1. Participants completed a pretest comprising 10 questions within 10 minutes.
2. The team presented material on Chronic Obstructive Pulmonary Disease (COPD) and the ACBT to aid airway clearance for COPD patients.
3. A demonstration of the ACBT was conducted.
4. Participants completed a post-test questionnaire that included 10 questions, also within 10 minutes.
5. All participants performed a demonstration of the ACBT, guided by the community service team.

Setting

Sungai Ambawang Public Health Center.

Target

Fifty individuals from the general public and COPD patients participated in a community service event at the Sungai Ambawang health center.

RESULTS AND DISCUSSION

We conducted community service focused on public education to enhance airway clearance optimization in adult patients with chronic obstructive pulmonary disease (COPD). This initiative involved breathing exercises at the Sungai Ambawang Health Center in Kubu Raya Regency, where we engaged 50 participants. To assess the public's knowledge about optimizing airway clearance for COPD patients, we used a 10-question questionnaire and obtained the following results.

Table 1. Average Distribution Based on Pre-Post Test Knowledge of the ACBT on COPD Patients at Sungai Ambawang Public Health Center (n=50)

Knowledge	Mean	Median	Standard Deviation
Before	5,9	6	1,33
After	7,96	8	0,93

Table 1 shows that the average knowledge score before and after education is 5,9 and 7,89.

Table 2. Normality Test of Respondents' Knowledge Data of The ACBT on COPD Patient at Sungai Ambawang Public Health Center (n=50)

Knowledge	Median	Standard Deviation	P Value
Before	6	1,33	0,001
After	8	0,93	0,001

*Normal Distribution α>0,05 Shapiro Wilk Test

According to Table 2, the normality test results for the knowledge variable before the education indicated a p-value of 0.001 ($\alpha < 0.05$). This suggests that the distribution of knowledge before education is not normal. Similarly, the normality test results for the knowledge variable after education also showed a p-value of 0.001 ($\alpha < 0.05$), implying that the knowledge distribution after education is also not normal.

Table 3. The influence of education on respondents' knowledge of the ACBT on COPD patients at Sungai Ambawang Public Health Center (n = 50)

Knowledge	Median	Mean Difference	P Value
Before	6	2,06	0,001*
After	8		

*α<0,05 significant with the Wilcoxon test

Table 3 shows that the educational intervention significantly improved knowledge scores among participants, increasing from a median of 6 before the intervention to 8 afterwards. The average increase was 2.06. A Wilcoxon test indicated a significant p-value of 0.001 ($\alpha < 0.05$), confirming the effectiveness of the program in teaching COPD patients about the Active Cycle of Breathing Techniques at the Sungai Ambawang Health Center.

The research findings that the Peak Expiratory Flow (PEF) was found to be significantly impacted both before and on the third day after the Active Cycle of Breathing Technique (ACBT) intervention, according to research by Ardiansyah et al. (2021) on the effect of ACBT on lung function in patients who had undergone heart surgery. Sputum buildup was lessened, and patients' difficulty in breathing scores on the Modified Borg Scale dropped from 4 to 1, showing a major

improvement in patients with post-TB bronchiectasis who practiced ACBT four times (Pratama, 2021). When compared to the Pursed Lips Breathing technique, another similar study revealed that the ACBT technique significantly improved the oxygen saturation of COPD patients (Zuriati et al., 2020). In a related study, oxygen saturation and oxygen pressure in patients with COPD improved significantly (Samir A. EL Gazar & Nagy L. Nassif, 2020).

CONCLUSION

After conducting community service and analyzing the pretest-posttest evaluation results, we can conclude that our understanding of optimizing airway clearance in COPD patients has improved.

Community service initiatives can raise public awareness about optimizing airway clearance in COPD patients.

Recommendation

We anticipate that the head of the Sungai Ambawang Health Center will work closely with the health staff to improve support for optimizing airway clearance in patients with COPD. The community in the Sungai Ambawang Health Center area needs to receive re-education on how to enhance airway clearance for these patients.

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