

The Effect of Autogenic Training with Pursed Lips Breathing to Anxiety and Forced Expiratory Volume in One Second (FEV₁) COPD Patients

Titik Agustyaningsih^{1*}, Muhammad Amin² and Makhfudli²

¹Departement of Nursing, Faculty of Health Science, University of Muhammadiyah Malang, Jalan Bendungan Sutami 188, Malang, Indonesia 65145

²Faculty of Nursing, Airlangga University, Jalan Mulyorejo Surabaya, Indonesia 60115

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Abstract: COPD patients will experience increased airflow resistance, air trapping, and pulmonary hyperinflation. This condition causes a decrease in FEV₁ and symptoms of shortness will occur earlier. The purpose of this study was to explain the effect of autogenic training with pursed lips breathing on anxiety and FEV₁ of COPD patients. This research used Quasy Experiment with Pre-Post approach of control group design. The population of this research were PPOK patient in RSUD Kanjuruhan Kepanjen Malang Regency and RST dr. Soepraoen Malang. Sampling was done by Simple Random Sampling technique according to inclusion criteria with total of 40 patients. The autogenic training intervention with pursed lips breathing had done 3 times a week for 4 weeks. So the total exercise as much as 12 times. Instruments used to measure anxiety are Zung-Self Rating Anxiety Scale (SAS / SRAS) and FEV₁ using spirometry. Data analysis using Paired t test, Wilcoxon and Multivariate Manova test. Multivariate test result Manova got significance value 0,021 (α 0,05). This means that autogenic training with pursed lips breathing is effective in reducing anxiety and increasing the value of FEV₁ in COPD patients. Autogenic training with pursed lips breathing can reduce anxiety and increase FEV₁ values if done regularly.

1 INTRODUCTION

Chronic Obstructive Pulmonary Disease (COPD) is a disease that causes increased airflow resistance, water trapping, and pulmonary hyperinflation. The condition of pulmonary hyperinflation will cause mechanical inspiratory loss of the muscle resulting in increased ventilatory imbalances in breathing, strength and ability of the breathing effort to meet the tidal volume. Respiratory CPR patients become rapid and muscle fatigue diaphragm occurs, this is due to a decrease in blood flow to muscle and muscle weakness that causes increased anaerobic metabolism which aggravate lung work and support the occurrence of activity limitations. This condition will cause a decrease in Forced Expiratory Volume in One Second (FEV₁) (GOLD, 2017) . As a result of a decrease in FEV₁ it will affect the degree of severity or severity in people with COPD characterized by symptoms of shortness of breath so that this causes

the patient COPD experience anxiety (Vestbo et al., 2013).

Research conducted by researcher in RSUD KanjuruhanKepanjen Malang Regency got data from Respiratory clinic average every year treat 360-400 patient COPD and in RST Soepraoen mean every year treat 250-300 patient COPD. Results of interviews on 20 patients found that the patient is an active smoker and experienced shortness of breath such as choking and cough with phlegm. These symptoms make 11 out of 20 patients experience anxiety if the disease does not heal and fear of death. This phenomenon indicates the presence of self-care requests in patients with COPD who experience deficits in taking care of themselves as a result of various symptoms that arise as a manifestation of COPD disease. One role of nurses in the management of COPD patients is to do supportive educative associated with pulmonary rehabilitation of one of the autogenic training techniques with pursed lips breathing to reduce anxiety and increase the value of FEV₁. The combination of these two techniques has

never been done in RSUD KanjuruhanKepanjen Malang Regency and RST Soepraoen Malang.

2 METHODS

This research used Quasy Experiment with pre-post test control group design. The population of the study were COPD patient in RSUD KanjuruhanKepanjen Malang and RST dr.Soepraoen Malang. Sampling was performed by simple random sampling with total of 40 respondents divided into 2 groups (treatment group and control group). The study protocol has passed the ethical test with "Ethical Approval" No. 625-KEPK. The autogenic training intervention with pursed lips breathing had done 3 times a week for 4 weeks. So the total exercise as much as 12 times. Prior to the exercise, respondents were given first modules and videos that serve as a guide in carrying out the exercise. Pre test (measurement of anxiety and FEV₁) performed in the first week and post test (anxiety measurements and FEV₁) was performed in the fourth week at the time the patient controls to the pulmonary poly. Instruments used to measure anxiety are Zung-Self Rating Anxiety Scale (SAS / SRAS) and FEV₁ using spirometry. Statistical test using Paired t test, Wilcoxon and Multivariate Manovatest. Wilcoxon test results obtained p value 0,000 for the anxiety variable and FEV₁ treatment group. This means that there is an effect of autogenic training with pursed lips breathing on anxiety and FEV₁ in the treatment group. While in the control group, paired t-test results obtained p 0,081 for anxiety variable and Wilcoxon test results obtained p 0.195 for variable FEV₁. So it can be concluded that there is no difference in pre and post values of anxiety and FEV₁ variables in the control group. Multivariate Manova test results obtained significance value of 0.021 (α 0.05). This means that autogenic training with pursed lips breathing is effective in reducing anxiety and increasing the value of FEV₁ in COPD patients.

3 RESULTS AND DISCUSSION

Based on table 1 shows that the characteristics of respondents by age, most respondents have age 56-65 years as many as 26 respondents (65%). Characteristics of male gender is more than female that is 36 respondents (90%). Characteristics of education, the highest number of respondents is the primary education of 13 respondents (32.5%). Characteristic of the work, most of the respondents

are sales there are 15 respondents (37.5%). Most respondents for IMT mostly enter the normal category as many as 36 respondents (90%), for GOLD-based characteristics mostly GOLD 2 entry as many as 15 respondents (37.5%) and respondents mostly have a smoking history of 35 respondents (37.5%). Based on homogeneity test, it was found that the characteristics of age, sex, education, occupation, BMI, GOLD and smoking history showed homogeneous ($p > 0,05$).

Table 2 shows that after the data analysis test using wilcoxon test in the treatment group obtained p 0,000 which means there is influence of autogenic training with pursed lips breathing to anxiety. In the control group after test data analysis using paired t test (α 0.05) obtained p 0.081 which means there is no difference in pre and post anxiety values in the control group.

Table 3 shows that after test data analysis using wilcoxon test in the treatment group obtained p 0,000 which means there is influence of autogenic training with pursed lips breathing against FEV₁. In the control group after the data analysis test by using the test wilcoxon test obtained p 0.195 which means there is no difference in pre and post FEV₁ values in the control group.

Table 4 shows that the individual variance-covariance equation testing for each variable shows a Box Test value of 0.590 which means that the variance-covariance of all variables is the same for each group, so that in decision-making the statistical test results can be seen in Wilks' Lambda. Levene test on each variable shows $p > 0,05$ means variant of anxious and FEV₁ variables respectively are homogeneous between treatments. Manova test results showed a significance value of 0.021 (α 0.05) indicating that there was an average difference between anxiety and FEV₁ values in the treatment group and control group. This suggests that there is simultaneously an effect of autogenic training with pursed lips breathing in COPD patients.

The results showed that there was an effect of autogenic training (AT) with pursed lips breathing (PLB) to the anxieties of COPD patients. Based on the mean of pre test and post test, most of treatment group experienced decrease of anxiety level after giving AT with PLB. The decrease in anxiety levels is characterized by decreased anxiety symptoms in most treatment group patients. In the control group the average level of anxiety did not change.

Based on the results of multivariate manova test, it is known that the Partial Eta Squat value is higher in the anxiety variable when compared with the FEV₁ variable. This suggests that autogenic training with

pursed lips breathing has a greater effect in decreasing anxiety. The results of this study are in line with other studies that show that AT affects anxiety. The results of Kwon (2009) reported that AT is effective in reducing stress levels in pregnant women, according to a study by Murakami et al. (2006) AT supports the development of mental energy to create a positive self-image and self-efficacy and reduce

anxiety levels in patients. Goto et al (2012) also reported that AT reduces anxiety in patients with chronic subjective headaches. A meta-analysis of experimental studies showing AT has a positive effect for relieving stress in seven cases out of eight.

Table 1: Distribution of frequency based on the characteristics of respondents.

Characteristic	Group				Total	%	p value
	Treatment Group (n=20)		Control Group (n=20)				
	F	%	F	%			
Age							
Age 46-55 years	-	-	-	-	-	-	0,513
Age 56-65 years	14	70	12	60	26	65	
Age > 65 years	6	30	8	40	14	35	
Gender							
Male	18	90	18	90	36	90	1,000
Female	2	10	2	10	4	10	
Education						32,5	
Elementary School	5	25	8	40	13	35	0,532
Junior High School	8	40	6	30	14	25	
Senior High School	6	30	4	20	10	7,5	
College	1	5	2	10	3		
Work						20	
Unwork	4	20	4	20	8	17,5	0,528
Veteran	5	25	2	10	7	10	
Farm	1	5	3	15	4	37,5	
Trader	8	40	7	35	15	2,5	
Teacher	-	-	1	5	1	12,5	
Entrepreneur	2	10	3	15	5		
IMT						-	
≤ 18,5 (kg/m ²)	-	-	-	-	-	90	0,728
18,5 – 24,9 (kg/m ²)	18	90	18	90	36	10	
25 – 24,9 (kg/m ²)	2	10	2	10	4	-	
≥ 30 (kg/m ²)	-	-	-	-	-	-	
GOLD						10	
FEV1 ≥ 80%	1	5	3	15	4	37,5	
50% ≤ FEV1 < 80%	6	30	9	45	15	35	0,146
30% ≤ FEV1 < 50%	9	45	5	25	14	17,5	
FEV1 < 30%	4	20	3	15	7		
Smoke						87,5	
1. Smoke	18	90	17	85	35	12,5	0,633
2. Do not smoke	2	10	3	15	5		

Table 2: The results of normality test data of each group on anxiety variables.

Variables	Group	Pre-test (Mean±SD)	Min- Maks	Post-test (Mean±SD)	Min- Maks	Δ	P value
Anxiety	Treatment	45,75±7,166	31 - 67	36,80±8,58	26 - 64	-8,95	0,000
	Control	40,75±9,9	25 - 63	45,05±11,3	28 - 65	4,3	0,081

Table 3: The results of normality test data of each group on FEV₁ variables.

Variables	Group	Pre-test (Mean±SD)	Min- Maks	Post-test (Mean±SD)	Min- Maks	Δ	P value
FEV ₁ (liter)	Treatment	0,9925±0,36127	0,59-2,01	1,148±0,4453	0,65-2,19	0,155	0,000
	Control	0,8850±0,45041	0,49-2,51	0,8730±0,4800	0,48-2,51	0,0120	0,195

Table 4: The result of multivariate autogenic training with pursed lips breathing in treatment group and control group.

Variabel	N	Box Test				p value	
		Box M	F	df1	df2	Levene	Manova
Anxiety	20	0,590	0,639	3	2,599	0,155	0,021
FEV ₁	20					0,826	

In this study, it was found that the level of stress response in the experimental group was lower than in the control group. This shows that the AT program has a positive effect on the ability of nursing students to cope with stress. In line with research conducted by Lim et al (2015) AT provides an acceptable approach to stress reduction in nursing students, but no significant interactions were found for objective indicators of heart rate variation. COPD patients, clinically depressed and at least twice as likely to experience prolonged anxiety. Anxiety in patients with COPD would be associated with increased risk of exacerbations, worse health status associated with quality of life of the patient, worsening of the patient's condition causing the patient to be hospitalized (Coventry et al., 2013). Other symptoms commonly experienced by COPD patients other than anxiety and depression are emotional unstable, low coping strategies, feelings of helplessness, feelings of powerlessness, loss of freedom, social isolation and disturbance in relationships with others. The prevalence of anxiety in COPD patients is 10-50%, whereas the prevalence of COPD depression is 12-50% (Cleland, Lee, & Hall, 2007).

One of the interventions that can be performed on COPD patients is to provide education, rehabilitation and relaxation programs by carrying out breathing exercises to achieve controlled ventilation, efishen and reduce respiratory work. PLB is a therapy that can be done in the lung rehabilitation program performed during the activity or at rest that gives impact to reduce symptoms and improve the quality of life of patients with COPD (Rossi et al., 2014). The

PLB improves expiration by increasing the expiratory phase and preventing the prolapse of the airway. PLB is a technique that can be used to help breathe more effectively, allowing it to get the needed oxygen. PLB train to exhale more slowly, so that breathe easier and comfortable at rest or activity. Breathing with PLB will increase pressure in the oral cavity, this pressure will be passed through the bronchial branches so as to prevent water trapping and small airway collapse during expiration. Increased pressure on the oral cavity and pressure is passed through the bronchial branches so as to increase the value of forced expiratory volume in one second (FEV₁) in COPD (Smeltzer, S.C., & Bare, B.G., Hinkle, J.L., & Cheever, 2013).

Changes in lung function in COPD patients leads to decreased ability of patients in performing daily activities resulting in deficit in self-care. Based on the Nursing Theory of Self Care Orem (1971) in Allgood, M. R., & Tomey (2014) self care is an act of striving others to develop the ability possessed to be developed maximally, so that one can maintain optimal function. In self-care theory, nursing is defined as a practice activity that aims to mature people in maximizing the health function they have. One role of nurses in the management of COPD patients is to do supportive educative related to pulmonary rehabilitation of one of the PLB techniques and AT training.

This PLB breathing exercise will be combined with relaxation techniques to reduce anxiety and increase the confidence of COPD patients. According

to (Cafarella, Effing, Usmani, & Frith, 2012) there are various relaxation techniques that have been known and widely used among other guide imagery, yoga, pilates, taichi, chakra, meditation and autorelaxation techniques known as Autogenic Training (American Holistic Nurses' Association, 2005). Autogenic Training (AT) is a standard nursing intervention that has been enrolled in Nursing Intervention Classification (NIC) and has been used extensively in nursing orders to address anxiety in various situations with evidence level I (Ackley, 2008). When compared to other relaxation techniques, AT is a simple, easy, and simple relaxation technique that does not require special clothes or difficult body styles. AT can be studied easily and can be applied several minutes a day at the right time even in the midst of busyness. This technique is performed with 5 standard exercises: feel the extremes of weight and warm, breathe calmly and regularly, feel the heartbeat, feel the abdomen warm and head cool and through the delivery of positive suggestions that create the effects of psychological relaxation and ultimately anxiolytic effects (Vidas, Folnegović-Šmalc, Čatipović, & Kisić, 2011). Autogenic Training with Pursed Lips Breathing against FEV₁ of COPD patients.

The results showed that there was an effect of AT with PLB on FEV₁ of COPD patient. Based on the pretest and post test values, the treatment group experienced a significant increase in FEV₁ values after intervention rather than the control group. Increased FEV₁ was characterized by an increase in FEV score on pulmonary function examination using spirometry.

AT performed in this study combined with PLB from the results of research conducted by Bhatt et al (2013) found that after applying the PLB, the patient will experience an increase in exercise capacity. Patients revealed a decrease in dyspnea and RR frequency. Respiratory control during the PLB period causes an interrupts vicious cycle in air trapping. This occurs because of lower central nervous transmission and causes less dissociation between actual ventilator signals and perceived effort, resulting in lower perceived dyspneu perception. The breath control technique with PLB can increase 20% FEV₁ and FVC, as well as reduce water trapping. Reduction of hyperinflation is due to a decrease in tidal volume. Decreased respiratory frequency also occurs due to adjustment of perfusion and ventilation time (VA / Q).

The results of this study are also in line with research conducted by EkoSuryantoro that the PLB or six minutes walk test are equally able to increase the

value of FEV₁. However, there was no significant difference in FEV₁ value increase between PLB group and the six minutes walk test group as indicated by p value 0.117 ($p > 0.05$). The average in the PLB group was 12.86 (standard deviation 16.37), while in the six minutes walk test group was 6.09 (standard deviation 9.37). Based on the average value of Pursed Lips Breathing has a greater tendency in increasing the value of FEV₁ than six minutes walk test. This is because the PLB is more able to train the respiratory muscles to prolong expiration and increase airway resistance when expiratory, thus reducing airway resistance and trapped air, and shortness of breath.

PLB is a breathing exercise by pressing lips aimed at slowing expiration, preventing collapse of lung units, and helping patients to control respiratory rates as well as respiratory depth, so patients can achieve control of dyspnea and panic (Smeltzer, S.C., & Bare, B.G., Hinkle, J.L., & Cheever, 2013). Patients with COPD usually find it difficult to expire rather than inspire, as the tendency to close the airway increases with extra positive pressure in the chest during expiration (Guyton, A.C & Hall, 2007). Pursing the lips of the breathing helps the COPD patient to empty the lungs and slow the rate of breathing. PLB helps to restore the diaphragm position which is the respiratory muscle located below the lung. Usually when the diaphragm inspiration is curved, the lung expands and the diaphragm moves downward. PLB also causes the abdominal muscles to contract when expiratory, this will force the diaphragm upwards, and help to empty the lungs, consequently COPD patients will breathe more slowly and more efficiently (Petty, T. L., Burns, M. & Tiep, 2005) after people with COPD breathe more slowly and more efficiently, it is expected that the patient can perform a maximum expiratory expression as indicated by an increase in FEV₁ values from the spirometry results. FEV₁ represents volume in the first second at maximum expiration after maximum inspiration and is a measure of how quickly the lungs can be emptied (Reid, W. D. & Chung, 2004).

PLB causes increased pressure in the oral cavity, then this pressure is passed through the bronchial branches so as to prevent water trapping and small airway collapse at expiratory time. Improvements in air trapping will increase the value of FEV₁ (Smeltzer, S.C., & Bare, B.G., Hinkle, J.L., & Cheever, 2013).

PLB can decrease shortness of breath, so the patient can tolerate the activity and improve the ability to meet daily needs. If this technique is done routinely and correctly, it can optimize pulmonary mechanical function, limiting the increased end-volume of pulmonary expiration and preventing the

effects of hyperinflation (Sheadan, 2006 in Ariestianti et al, 2014). This is also in line with research conducted by Pereira De Araujo et al (2015) against 25 patients with COPD who concluded that PLB may decrease hyperinflation.

The results obtained data that most of the respondent's age is ≥ 65 years. At that age included in the elderly category. In the elderly there will be an aging process characterized by the decline in the various structures and functions of cells, tissues and organ systems (Fatmah, 2010). Lung organ in elderly also decrease function, so at examination of lung physiology by using spirometry resulted decrease of FEV_1 / FVC and FEV_1 .

The results also showed that most of the sexes were male and had a history of smoking, thus impacting pulmonary function decline. This is in line with the statement of the Global Initiative for Chronic Obstructive Lung Disease that gender and smoking history are risk factors for COPD in a person (GOLD, 2017). This study is in line with a study by Nisa et al, 2015 which showed that smoking history and male sex influenced the FEV_1 / FVC ratio.

In this study autogenic training with pursed lips breathing is done regularly with one weekly practice mentoring, while the second and third exercises of patients perform independently with family assistance. The final result of this research is the increase of FEV_1 value in the treatment group. The increase in FEV_1 values indicates the patient's success in self-care.

Based on the data tabulation of FEV_1 values in the control group, it was found that 5 respondents also experienced an increase in FEV_1 . This is because doctors and nurses in RST dr. Soepraoen Malang provide pharmacological therapy and health education in COPD patients who undergo outpatient treatment. Education provided in the form of advice to patients to comply with prescribed medications that have been made by doctors, the suggestion to quit smoking, eat with balanced nutrition, not doing too heavy activities, and suggestions to perform light activities in accordance with the ability of patients.

The mean difference of mean intervention group FEV_1 was greater when compared to the control group. Most respondents experienced an increase in FEV_1 values in the intervention group. This is because doctors and nurses at RSUD Kanjuruhan Kepanjen Malang regency provide pharmacology therapy and health education in COPD patients who undergo outpatient, besides respondents also get intensive mentoring program that is training autogenic training with pursed lips breathing. So it can be concluded that procedural treatment in

Respiratory Clinic and autogenic training intervention with pursed lips breathing shows improvement in one of the lung function that is increase FEV_1

4 CONCLUSIONS

Autogenic Training with Pursed Lips Breathing significantly reduces anxiety and increases forced expiratory volume in 1 second (FEV_1) in COPD patients.

REFERENCES

- Ackley, B. J. (2008). *Evidence-Based Nursing Care Guidelines: Medical-Surgical Interventions*. Amsterdam: Mosby Elsevier.
- Alligood, M. R., & Tomey, A. M. (2014). *Nursing Theorist and Their Work*. Philadelphia: Mosby Year Book Incorporate.
- American Holistic Nurses' Association. (2005). *Holistic Nursing: A Handbook for Practice*. (& C. E. G. B. M. Dossey, L. Keegan, Ed.) (4th ed.). Sudbury: Jones and Bartlett Publishers.
- Ariestianti, I., Pangkahila, J. A., & Purnawati, S. (2014). Pemberian Diaphragmatic Breathing Sama Baik Dengan Pursed Lip Breathing Dalam Meningkatkan Arus Puncak Ekspirasi Pada Perokok Aktif Anggota Club Motor Yamaha Vixion Bali Di Denpasar | Majalah Ilmiah Fisioterapi Indonesia. Retrieved November 5, 2019, from <https://ojs.unud.ac.id/index.php/mifi/article/view/8473>
- Bhatt, S. P., Luqman-Arafath, T. K., Gupta, A. K., Mohan, A., Stoltzfus, J. C., Dey, T., ... Guleria, R. (2013). Volitional pursed lips breathing in patients with stable chronic obstructive pulmonary disease improves exercise capacity. *Chronic Respiratory Disease*, 10(1), 5–10. <https://doi.org/10.1177/1479972312464244>
- Cafarella, P. A., Effing, T. W., Usmani, Z. A., & Frith, P. A. (2012, May). Treatments for anxiety and depression in patients with chronic obstructive pulmonary disease: A literature review. *Respirology*. <https://doi.org/10.1111/j.1440-1843.2012.02148.x>
- Cleland, J. A., Lee, A. J., & Hall, S. (2007). Associations of depression and anxiety with gender, age, health-related quality of life and symptoms in primary care COPD patients. *Family Practice*, 24(3), 217–223. <https://doi.org/10.1093/fampra/cmm009>
- Coventry, P. A., Bower, P., Keyworth, C., Kenning, C., Knopp, J., Garrett, C., ... Dickens, C. (2013). The Effect of Complex Interventions on Depression and Anxiety in Chronic Obstructive Pulmonary Disease: Systematic Review and Meta-Analysis. *PLoS ONE*,

- 8(4), e60532.
<https://doi.org/10.1371/journal.pone.0060532>
- Fatmah. (2010). *Gizi Usia Lanjut*. Jakarta: Erlangga.
- GOLD. (2017). Pocket guide to COPD diagnosis, management and prevention. *Global Initiative for Chronic Obstructive Lung Disease*.
<https://doi.org/10.1097/00008483-200207000-00004>
- Goto, F., Tsutsumi, T., Kabeya, M., & Ogawa, K. (2012). Outcomes of autogenic training for patients with chronic subjective dizziness. *Journal of Psychosomatic Research*, 72(5), 410–411.
<https://doi.org/10.1016/j.jpsychores.2012.01.017>
- Guyton, A.C & Hall, J. . (2007). *Buku ajar fisiologi kedokteran diterjemahkan oleh Irawati, Ramadhani, D., Indriyani, F., Dany, F., Nuryanto, I., Rianti, S.S.P., Resmisari, T., & Suyono, Y* (11th ed.). Jakarta: EGC.
- Kwon, Y. S. (2009). *The effect of autogenic training prenatal education to the anxiety, depression and stress of the pregnant woman*. Unpublished master's thesis. Seoul, South Korea: Seoul University of Buddhism.
- Lim, T. K., Ko, F. W. S., Thomas, P. S., Grainge, C., & Yang, I. A. (2015). Year in review 2014: Chronic obstructive pulmonary disease, asthma and airway biology. *Respirology*, 20(3), 510–518.
<https://doi.org/10.1111/resp.12488>
- Murakami, M., Koike, K., Ashihara, M., Matsuno, T., Tazoe, M., & Katsura, T. (2006). Recent advance of autogenic training in clinical practice of psychosomatic medicine in Japan. *International Congress Series*, 1287, 240–245.
<https://doi.org/10.1016/j.ics.2005.12.054>
- Nisa, K., Sidharti, L., & Adityo, M. F. (2015). Pengaruh kebiasaan merokok terhadap fungsi paru pada pegawai pria di gedung rektorat universitas lampung. *Jurnal Kedokteran Universitas Lampung*, 5(9), 38–42.
- Pereira De Araujo, C. L., Karloh, M., Dos Reis, C. M., Palú, M., & Mayer, A. F. (2015). Pursed-lips breathing reduces dynamic hyperinflation induced by activities of daily living test in patients with chronic obstructive pulmonary disease: A randomized crossover study. *Journal of Rehabilitation Medicine*, 47(10), 957–962.
<https://doi.org/10.2340/16501977-2008>
- Petty, T. L., Burns, M. & Tiep, B. L. (2005). *Essentials of pulmonary rehabilitation: A do it yourself guide to enjoying life with chronic lung disease*. California: Lomita.
- Reid, W. D. & Chung, F. (2004). *Clinical management notes and case histories in cardiopulmonary physical therapy*. USA: SLACK Incorporated.
- Rossi, A., Guerriero, M., Corrado, A., Ligia, G. P., Mussoni, A., Savoia, F., ... Roggi, G. (2014). Withdrawal of inhaled corticosteroids can be safe in COPD patients at low risk of exacerbation: A real-life study on the appropriateness of treatment in moderate COPD patients (OPTIMO). *Respiratory Research*, 15(1). <https://doi.org/10.1186/1465-9921-15-77>
- Smeltzer, S.C., & Bare, B.G., Hinkle, J.L., & Cheever, K. . (2013). *Brunner And Suddarth's Text Book Of Medical Surgical Nursing 11th Ed Volume 1*. Philadelphia: Lippincot.
- Vestbo, J., Hurd, S. S., Agustí, A. G., Jones, P. W., Vogelmeier, C., Anzueto, A., ... Rodriguez-Roisin, R. (2013). Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease. *American Journal of Respiratory and Critical Care Medicine*, 187(4), 347–365.
<https://doi.org/10.1164/rccm.201204-0596PP>
- Vidas, M., Folnegović-Šmalc, V., Čatipović, M., & Kisić, M. (2011). The application of autogenic training in counseling center for mother and child in order to promote breastfeeding. *Collegium Antropologicum*.