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A STUDY TO EVALUATE THE EFFECTIVENESS OF PURSED LIP BREATHING EXERCISE ON SELECTED PHYSIOLOGICAL PARAMETERS AMONG PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) RESIDING IN COMMUNITIES OF INDORE, MADHYA PRADESH

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INTRODUCTION:

Chronic obstructive pulmonary disease (COPD) is a preventable and treatable disease characterized by persistent, often progressive airflow obstruction due to abnormalities in the airways (bronchitis, bronchiolitis) and/or alveoli (emphysema) which leads to chronic respiratory symptoms such as dyspnea, cough, sputum, and/or aggravation. COPD symptoms significantly impact a person's activity, health status, and quality of life (QOL), particularly as dyspnea is a major contributor to COPD-related anxiety and disability. These symptoms can also affect family life and the individual's ability to perform daily activities, like household chores and climbing stairs. Apart from pulmonary symptoms, COPD may also manifest with systemic symptoms, including fatigue, weight loss, and sleep disturbances, as well as psychiatric symptoms like depression and anxiety, which severely compromise QOL.

As COPD progresses, the obstruction of airflow is accompanied by chest hyperinflation, which mechanically disadvantages the inspiratory muscles in terms of the length-tension relationship. The diaphragm becomes shortened and flattened, reducing its resting length and maximum tension-generating capacity. This diminishes the diaphragm's ability to exert force, weakening the inspiratory muscles' function, evident in a decrease in maximal inspiratory muscle pressure (PImax). The extent to which hyperinflation contributes to the decline in inspiratory muscle strength remains unclear, but even minor increases in hyperinflation can significantly reduce PImax. Consequently, reduced inspiratory muscle

strength exacerbates dyspnea and puts individuals at risk of respiratory muscle fatigue. Pursed lip breathing is a breathing exercise in which respiratory patients often learn spontaneously. In this study, COPD patients are taught to practice pursed lip breathing exercise by inhaling slowly through nose and exhaling gut more slowly through pursed lips. Pursed lip breathing exercise should be practiced for 8-10 repetitions each cycle 3-4 times a day. A pursed lip prolongs exhalation thus prevents bronchiolar collapse and air trapping. It relieves shortness of breath and promotes comfort by reducing hyper ventilation and increasing CO2levelsinthealveoli. The increased CO2 level relaxes and dilates smooth muscles of airway, increases the ratio of ventilation-perfusion and also oxygen level in the blood.

MATERIALS AND METHODS:

An evaluative approach with pre-experimental design was used to assess the effectiveness of pursed lip breathing exercise on selected physiological parameters among COPD patients. Modified conceptual framework based on Rosenstock‟s & Becker‟s Health Belief model (1984) explained the whole research process. Demographic proforma and physiological parameters assessment scale was the tool used for data collection. Age, sex, educational status, occupation, monthly family income, place of residence, duration of illness and smoking habit were included in demographic proforma. Heart rate, respiration rate and peak expiratory rate were the components of physiological parameters assessment scale. Three ranges have given for each component with normal, increased and decreased value. Wrist watch is used for heart rate and respiration rate estimation and peak flow meter is used for peak expiratory flow rate. The minimum score of physiological parameters assessment scale is 3 and maximum score is 9. On the basis of scoring, patient's physiological condition is categorized as good, satisfactory and poor. Tool validation was done by 9 experts from the field of medical and surgical nursing, physicians and biostatistics. The reliability of the tool was established using test-retest method and was found to be 0.72. Pilot study was done on 5 COPD patients and found that it is feasible and practicable. The main study was done on 50 COPD patients at selected communities Indore. Permission for conducting the study was obtained from medical officers of selected PHCs. Sample was selected according to the inclusion criteria using purposive sampling technique. Patients were explained about the purpose of the study and informed consent

was taken. Pretest was done using demographic proforma and physiological parameters assessment scale. After pretest, pursed lip breathing exercise demonstration is done and encouraged to do the exercise daily in 3-4 times with 8-10 repetitions on each cycle.

Post test is done on the 8th day using the same physiological parameters assessment scale. Data analysis was performed using descriptive statistics in terms of frequency, percentage, mean, median and standard deviation. The pre-test and post test score of physiological parameters would also be assessed by frequency and percentage. The effectiveness of pursed lip breathing on selected physiological parameters is analyzed by paired "t" test. The association of pre-test score of selected physiological parameters with selected demographic variable is evaluated by using chi-square test.

RESULTS:

In pre-test 66% (33) COPD patients had satisfactory condition, 34% (17) had poor condition and none of them were in good condition. After pursed lip breathing 90% (45) had good condition and 10% (5) had satisfactory condition. There was statistical significance ($t=16.335$, $p<0.05$) on selected physiological parameters by pursed lip breathing exercise with a significant difference in mean post test score (4.1±0.92) than their mean pre-test score (7.22±0.99). There was significant association between the pre-test score of selected physiological parameters and smoking habit among COPD patients ($\chi^2=4.37$, $p<0.05$).Prior studies have suggested that pursed lip breathing exercise produce significant changes in heart rate, respiratory rate and SpO2in patients with COPD. And also proposed that COPD was positively associated with age and smoking and inversely with body mass index

CONCLUSION:

Despite optimal medical therapy, people living with COPD continue to experience persistent shortness of breath with their activities of daily living and therefore must engage in the long term tasks of self-management. Adequate information and education on health promotion and disease management activities will show a positive impact in both healthy and clinical populations. Pursed lip breathing exercise taught and nurtured COPD patients into an active lifestyle, where they reassumed control in their physiological parameters and dyspnea. This study will help the COPD patients to get awareness regarding pursed lip breathing exercise and responds favorably and makes appropriate physiological changes.

From the finding of the study it can be concluded that pursed lip breathing exercise is effective in normalizing the physiological parameters such as heart rate, respiratory rate and peak expiratory flow rate among COPD patients.

REFERENCES:

1. Larson J.L., Covey M.K., Corbridge S. Inspiratory muscle strength in chronic obstructive pulmonary disease. AACN Clin. Issues. 2002;13:320–332.
2. Sheraz S., Ferraro F.V., Siddiqui F.A., Tariq H., Anthony Faghy M., Malik A.N. The effects of inspiratory muscle training on balance and functional mobility: A systematic review. Postgrad. Med. 2023;135:690–700. doi: 10.1080/00325481.2023.2253136.
3. Ferraro F.V., Gavin J.P., Wainwright T., McConnell A. The effects of 8 weeks of inspiratory muscle training on the balance of healthy older adults: A randomized, double-blind, placebo-controlled study. Physiol. Rep. 2019;7:14076.
4. Beaumont M., Forget P., Couturaud F., Reychler G. Effects of inspiratory muscle training in COPD patients: A systematic review and meta-analysis. Clin. Respir. J. 2018;12:2178–2188. doi: 10.1111/crj.12905.
5. Wu W., Chen Z., Zhou H., Wang L., Li X., Lv Y., Sun T., Yu L. Effects of Acute Ingestion of Caffeine Capsules on Muscle Strength and Muscle Endurance: A Systematic Review and Meta-Analysis. Nutrients. 2024;16:1146. doi: 10.3390/nu16081146.
6. NHS. Respiratory tract infections (RTIs). 2021. [Last cited: 26th Nov 2023]. Available at: https://www.nhs.uk/conditions/respiratory-tract-infection/.
7. American Lung Association. Occupational Lung Disease | American Lung Association. 2023. [Last cited: 26th Nov 2023]. Available at: https://www.lung.org/lung-health-diseases/lung-disease-lookup/occupational-lung-diseases.
8. Sharma SK, Telles S, Balkrishna A. Effect of Alternate Nostril Yoga Breathing on Autonomic and Respiratory Variables. Indian Journal of Physiology and Pharmacology. 2011 Jan; 55(5): 41.