# Effect of Breathing Exercises on Dyspnoea and Quality of Life Among COPD Patients.

**Dr.Sherin P.K**
Principal
Shri K. L. Shastri Smarak Nursing College, Mubarakpur, Mutkkipur, Uttar Pradesh

## I. INTRODUCTION

COPD is a prominent cause of disability and mortality worldwide. COPD exacerbations are distinguished by episodes of persistent dyspnea, cough, and sputum production, which are frequently followed by hospitalizations. Chronic obstructive pulmonary disease (COPD) exacerbations may necessitate hospitalisation.

Anxiety and sorrow, the most common psychological comorbidities, reduce the quality of life for people with COPD. Physical and emotional health, social functioning, physiological discomfort, mental health, and vitality are all linked to reduced functional status and an increased chance of disability. Even after controlling for other medical diseases, the severity of COPD, and dyspnea, anxiety, and sorrow were still substantially connected to a lower functional status. Anxiety is also associated with FVC (foot volume capacity) and chest discomfort.

Shortness of breath in COPD patients can be aggravated by anxiety-induced hyperventilation, which causes bronchoconstriction and pulmonary hyperinflation. Hyperinflation increases the amount of effort required to breathe and decreases the amount of reserve capacity that can be used to ease breathing problems.

Finally, high levels of anxiety are linked to an increased risk of COPD exacerbation-related hospitalizations, deaths, relapses, and readmission. Only a few studies have been conducted to evaluate anti-anxiety therapies in COPD exacerbation patients. Several studies have been conducted to investigate the anxiety that arises during the hospitalisation procedure. Despite this, there have only been a few studies (18) on the effects of a breathing regimen on anxiety.

According to prior research, regulated breathing can help with a variety of lung disorders. The researchers hypothesised that controlled deep breathing, similar to quitting smoking, would lower negative effect levels.

Active expiration, slow and deep breathing, pursed-lips breathing, relaxation treatment, specific body positions, inspiratory muscle training, and diaphragmatic breathing are all examples of regulated breathing activities. In COPD patients, controlled breathing minimises dynamic hyperinflation, improves gas exchange, strengthens respiratory muscles, and improves the thoracoabdominal motion pattern. Controlled breathing's efficiency may also be boosted by psychological impacts such as the capacity to regulate one's own breath. The current study, however, makes no mention of these repercussions.

Selected hospitals in Uttar Pradesh performed research to examine if controlled breathing techniques may benefit patients with COPD exacerbation as well as alleviate symptoms such as dyspnea, sleep disruptions, stress, depression, and overall quality of life.

## II. METHODS

The ethical committees of many hospitals in Uttar Pradesh approved this randomised pilot study, and all participants provided written consent before taking part.

Participants admitted to selected hospitals in Uttar Pradesh for COPD exacerbation were compared to the outcomes of a 10-day controlled breathing programme and a standard care control intervention. Participants in the standard care group received standard medical care. Both primary and secondary outcomes were assessed at the time of admission and release.

### Counting the Number of Samples Required

The sample size was calculated using the study's findings, specifically the symptoms of anxiety and sadness. As in previous studies, the control group was expected to have an increase in anxiety and depression symptoms (2, 3, and 3 points on the Hospital Anxiety and Depression scale), whereas the treatment group was expected to have a slight positive effect (5 points on the Hospital Anxiety and Depression questionnaire score). We needed 23 patients in each group to establish statistically significant differences in anxiety and depression between the two groups using a two-sided =.05 and a hypothetical dropout rate of 20%.

**Making Use of a Random Number Generator**

To assign patients to treatment or control groups, nurses used a computer-generated randomization list. The nurse informed physiotherapy of the participant's admittance into the trial once they had given their consent and been accepted into it.

Subjects Over the course of six months, patients with non-infectious COPD exacerbations who were admitted to the hospital's respiratory care unit were recruited. Using the criteria established by the American Thoracic Society, it was found that the patient had COPD. For at least 10 days, all individuals had been free of exacerbations. Patients were unable to participate in this trial due to organ failure, malignancy, or an inability to meet the study's conditions. As a result, during the exacerbation, 76 percent received systemic steroids, while 100 percent received inhaled bronchodilators and oxygen.

**A Program for Breathing Control**

A researcher did the regulated breathing exercise twice a day while the patient was in the hospital. During the 30-minute physiotherapy session, participants were granted three-minute pauses. The regimen included three types of breathing exercises: relaxation, pursed-lip breathing, and vigorous expiration (exhaling fully).

**Experiment with different relaxation techniques.**

According to studies, hyperinflation is produced, at least in part, by increased inspiratory muscle activity during expiration, which is why relaxation treatments have been shown to be partially reversible. This elevated activity may remain when recovering from an acute bout of airway obstruction, adding to dynamic hyperinflation. Another goal of relaxation is to reduce breathing frequency while increasing tidal volume.

**Exhaling by squeezing your mouth shut**

The dynamic and protracted character of pursed-lip breathing promotes exhalation and prevents airway collapse. A fairly vigorous exhale through pursed lips results in an expiratory pressure of approximately 5 cm H2O. When compared to spontaneous breathing, the frequency of inhalation is reduced, dyspnea is reduced, and PaCO2 levels at rest are enhanced. Patients who received symptom-benefit therapy had lower tidal volume and frequency of breathing.
active expiration date.

By increasing abdominal pressure during vigorous expiration, diaphragm function at its maximal length is promoted. During resting breathing, there was no difference in diaphragm displacement and its contribution to tidal volume between COPD patients and healthy individuals. Exercising vigorously also increases diaphragm and rib cage elastic recoil pressure, which is released on inhalation by relaxing exhalatory muscles.

Activated expiration is a common reaction to an increase in ventilatory needs. People with COPD may exhibit spontaneous abdominal muscular activation when at rest, depending on the degree of the airway obstruction. Despite the fact that active expiration improves diaphragm function, its impact on dyspnea is unknown.

**Finishing Metrics**

The Hospital Anxiety and Depression Scale (HADS) was developed to assess how worried and depressed hospital patients are.

The Hospital Anxiety and Depression Scale (HADS) has 14 items that are used to assess the amount of psychological morbidity in sick patients. The test includes depression and anxiety subscales with values ranging from zero to twenty-one. A score of 8 or higher on either subscale is more likely to indicate depression and anxiety than a score of 11 or higher. An overall depression score of 8 is considered normal, but anything between 8 and 10 indicates mild depression, 11 to 14 indicates moderate depression, and 15 indicates severe depression. The Hospital Anxiety and Depression Scale has a Cronbach alpha of 0.83 for anxiety and 0.82 for depression.

The Questionnaire for the St. George's Respiratory System is now accessible.

The St George's Respiratory Questionnaire is a standardised, self-administered questionnaire designed to assess the worsening health and perceived quality of life of individuals with airway disease. The first 50 elements of this matrix include symptoms, activities, and consequences. Each domain is assigned a score, and the total score is calculated by averaging the scores of all domains. A lower score suggests a higher level of health-related quality of life.

The Asthma Severity Index It was modified by the Medical Research Council.

Researchers updated the Medical Research Council's chronic dyspnoea self-administered questionnaire, which

consists of six items concerning patients' experiences with breathlessness, with the aim of measuring breathlessness.
No dyspnoea is represented by category 0; shortness of breath when hurrying on the level or walking up a modest incline is represented by category 1; mild dyspnoea is represented by category 2; and fairly severe dyspnoea is represented by category 3. too short of breath to leave the house, or too short of breath when changing or undressing.

**A survey to assess one's degree of happiness**

The EQ-5D questionnaire has two primary components: the EQ-5D visual analogue scale and the EQ-5D index. There is a 0-10 point visual analogue scale with a rating scale of 0 percent to 100 percent (0 percent = death/worst possible health and 100 percent = best possible health). The other two are anxiety/depression and pain/discomfort. The questionnaire inquires about five distinct areas of mobility and self-care. For each item, the subject chooses one of three health conditions (good, fair, or bad), and the number or percentage of subjects who choose each category is recorded.

**Affordability and longevity.**

The subject's hand-grip strength was measured using a dynamometer (TEC-60, Technical Products, Clifton, New Jersey), which had been properly calibrated to fit the size of the hand. Each hand's max force was measured by taking three measurements and noting the findings. This test can be used to assess muscle strength in COPD patients.
Increase in Respiratory Muscle Power

The researchers assessed each subject's peak inspiratory and exhalatory rates four times at two-minute intervals and compared them to expected values. Cardiopulmonary physiotherapists performed all of the client's breathing tests while he sat in a chair.

Analysis of Variance Based on Statistics (ANOVA)
The U and chi-square tests were used to compare baseline attributes using continuous and categorical data. When data is analysed, it can be presented in a variety of ways. An analysis of variance with a two-way repeated measures design was used to evaluate the differences between and within groups. The paired-sample Student t test was also employed to compare within-group differences between the two groups. Intention to treat analysis was performed to determine if patients who were unable to complete the programme improved at the same rate as the average improvement in the intervention group. The two-tailed P-value of 0.05 revealed no statistical significance. For all statistical analyses, statistics software was used (SPSS 20.0, SPSS, Chicago, Illinois).

## III. RESULTS

The findings of the study revealed that every single participant was a man. The respondents in this study ranged in age from 76.55 to 74.436.9 years old. There was no statistically significant difference in the proportion of participants who smoked or drank alcohol. Both groups were hospitalised twice a year, once for intervention and once for control. The St. George Respiratory Questionnaire's activity domain and total score were significantly different between groups, with higher values in the control group indicating a lower quality of life.

The baseline levels did not differ much. There was an improvement in dyspnea scores (P =.004) in the intervention group between baseline and discharge, but an increase in dyspnea scores in the control group.The controlled breathing approach reduced anxiety and depression on the hospital anxiety and depression scale. Depression scored higher in terms of mean change (10.56 versus 0.465). Following discharge, the intervention group's ratings on the European Quality of Life subscales indicated greater gains in mobility and anxiety/depression than the comparison group's.

## IV. DISCUSSION

The researchers wanted to know how individuals with COPD exacerbation felt as a result of a regulated breathing regimen in this study. Despite several studies showing the physical and psychological impacts of hospitalisation, no studies on acute COPD patients have been conducted.

According to researchers, COPD patients experienced worse physical symptoms, a lower quality of life, and higher levels of worry and despair than people with other illnesses, according to the researchers. Some COPD patients believe that their severe and intractable dyspnea is caused by worry. Patients with COPD who have a low health-related quality of life are more likely to be readmitted if they suffer from anxiety or depression.

A variety of trials for the treatment of anxiety, depression, quality of life, and function in people with COPD exacerbations have been conducted, with various degrees of effectiveness. Researchers discovered that, as compared to typical care, St. George's Respiratory Questionnaire scores climbed significantly, while another study discovered that the Barthel score improved when patients utilised a gutter frame rather than a rollator to manoeuvre around. There were no significant variations between the two groups in terms of daily weight, eating, sleeping, and activity ratings. To the best of

our knowledge, no previous studies have studied the efficacy of a therapy programme in patients with COPD exacerbation, taking into consideration the characteristics included in the current study. Exacerbating COPD has been found in a number of studies to have a considerable impact on patients' health-related quality of life as well as their capacity to perform daily functions such as breathing.

The hospitalisation effect resulted in considerable gains in functional and psychological indices in the intervention group but significant deterioration in the control group. As a result, according to this notion, the patient's inactivity while in the hospital contributes to functional and psychological suffering during a COPD exacerbation.

Patients with COPD who are anxious may benefit from pulmonary rehabilitation. According to Emery and colleagues, a combination of exercise training and stress management education dramatically lowers anxiety. In stress management sessions, fitness training was found to have little effect on anxiety. This is consistent with our findings, which suggest that exercise can enhance COPD patients' mental health in a variety of ways.

The current study has two fundamental shortcomings. To begin with, the study exclusively comprised male participants. Second, once the patients were discharged from the hospital, we were unable to gather any follow-up data.

## V. CONCLUSIONS

Our study focuses on a critical rehabilitation option for people with COPD, and it is unique in that it investigates the benefits of breathing strategies immediately following an exacerbation.

## REFERENCES

[1] World Health Organization. Chronic respiratory diseases: burden of COPD. http://www.who.int/respiratory/copd/burden/en/. Accessed June 8, 2012.
[2] Mannino DM, Buist AS. Global burden of COPD: risk factors, prevalence, and future trends. Lancet 2007;370(9589):765-773.
[3] Niewoehner DE, Lokhnygina Y, Rice K, Kuschner WG, Sharafkhaneh A, Sarosi GA, Kesten S. Risk indexes for exacerbations and hospitalizations due to COPD. Chest 2007;131(1):20-28.
[4] Aydin IO, Ulusahin A. Depression, anxiety comorbidity, and disability in tuberculosis and chronic obstructive pulmonary disease patients: Applicability of GHQ-12. Gen Hosp Psychiatry 2001;23(2):77-83.
[5] Weaver TE, Richmond TS, Narsavage GL. An explanatory model of functional status in chronic obstructive pulmonary disease. Nurs Res 1997;46(1):26-31.
[6] Kim HF, Kunik ME, Molinari VA, Hillman SL, Lalani S, Orengo CA, et al. Functional impairment in COPD patients: the impact of anxiety and depression. Psychosomatics 2000;41(6):465-471.
[7] Borak J, Chodosowska E, Matuszewski A, Zielinski J. Emotional status does no alter exercise tolerance in patients with chronic obstructive pulmonary disease. Eur Respir J 1998;12(2):370-373.
[8] Mikkelsen RL, Middelboe T, Pisinger C, Stage KB. Anxiety and depression in patients with chronic obstructive pulmonary disease (COPD). A review. Nord J Psychiatry 2004;58(1):65-70.
[9] Al-Gamal E, Yorke J. Perceived breathlessness and psychological distress among patients with chronic obstructive pulmonary disease and their spouses. Nurs Health Sci 2013 [Epub ahead of print] DOI: 10.1111/nhs.12073.
[10] Smoller JW, Otto MW. Panic, dyspnea, and asthma. CurrOpinPulm Med 1998;4(1):40-45.
[11] O'Donnell DE, Banzett RB, Carrieri-Kohlman V, Casaburi R, Davenport PW, Gandevia SC, et al. Pathophysiology of dyspnea in chronic obstructive pulmonary disease: a roundtable. Proc Am Thorac Soc 2004;4(2):145-168.
[12] Collins E, Langbein E, Fehr L, O'Connell S, Jelinek C, Hagarty E, et al. Can ventilation-feedback training augment exercise tolerance in patients with chronic obstructive pulmonary disease. Am J Respir Crit Care Med 2008;177(8):844-852.
[13] Yohannes AM, Baldwin RC, Connolly MJ. Depression and anxiety in elderly outpatients with chronic obstructive pulmonary disease: Prevalence, and validation of the BASDEC screening questionnaire. Int J Geriatr Psychiatry 2000;15(12):1090-1096.
[14] Almagro P, Calbo E, Ochoa de Echagüen A, Barreiro B, Quintana S, Heredia JL, Garau J. Mortality after hospitalization for COPD. Chest 2002;121(5):1441-1448.
[15] Stage KB, Middelboe T, Pisinger C. Depression and chronic obstructive pulmonary disease (COPD). Acta PsychiatrScand 2005;111(4):320-323.
[16] Dahlén I, Janson C. Anxiety and depression are related to the outcome of emergency treatment in patients with obstructive pulmonary disease. Chest 2002;122(5):1633-1637.
[17] Gudmundsson G, Gislason T, Janson C, Lindberg E, Hallin R, Ulrik CS, et al. Risk factors for rehospitalisation

in COPD: role of health status, anxiety and depression. Eur Respir J 2005;26(3):414-419.

[18] Lacasse Y, Guyatt GH, Goldstein RS. The components of a respiratory rehabilitation program. A systematic overview. Chest 1997;111(4):1077-1088.

[19] Schmidt NB, Woolaway-Bickel K, Trakowski J, Santiago H, Storey J, Koselka M, Cook J. Dismantling cognitive-behavioral treatment for panic disorder: Questioning the utility of breathing retraining. J Consult Clin Psychol 2000;68(3):417-424.

[20] Gosselink R. Controlled breathing and dyspnea in patients with chronic obstructive pulmonary disease (COPD). J Rehabil Res Dev 2003;40(5 Suppl 2):25-33.

[21] Gosselink R. Breathing techniques in patients with chronic obstructive pulmonary disease (COPD). Chron Respir Dis 2004(3);1:163-172.

[22] Gudmundsson G, Gislason T, Janson C, Lindberg E, SuppliUlrik C, Brøndum E, et al. Depression, anxiety and health status after hospitalisation for COPD: a multicentre study in the Nordic countries. Respir Med 2006;100(1):87-93.

[23] ATS statement. Standards for the diagnosis and care of patients with chronic obstructive pulmonary disease. Am J Respir Crit Care Med 1995;152(5 Pt 2):S77-S121.

[24] Rosenberg SR, Kalhan R. An integrated approach to the medical treatment of chronic obstructive pulmonary disease. Med Clin North Am 2012;96(4):811-826.

[25] Martin J, Powell E, Shore S, Emrich J, Engel LA. The role of the respiratory muscles in the hyperinflation of bronchial asthma. Am Rev Respir Dis 1980;121(3):441-447.

[26] Renfroe KL. Effect of progressive relaxation on dyspnea and state of anxiety in patients with chronic obstructive pulmonary disease. Heart Lung 1988;17(4):408-413.

[27] Van der Schans CP, De Jong W, Kort E, Wijkstra PJ, Koeter GH, Postma DS, Van der Mark TW. Mouth pressures during pursed lip breathing. Physioth Theory Pract 1995;11(1):29-34.

[28] Breslin EH. The pattern of respiratory muscle recruitment during pursed-lips breathing in COPD. Chest 1992;101(1):75-78.

[29] Mueller RE, Petty TL, Filley GF. Ventilation and arterial blood gas changes induced by pursed lips breathing. J ApplPhysiol 1970;28(6):784-789.

[30] Gorman RB, McKenzie DK, Pride NB, Tolman JF, Gandevia SC. Diaphragm length during tidal breathing in patients with chronic obstructive pulmonary disease. Am J Respir Crit Care Med 2002;166(11):1461-1469.

[31] Kleinman BS, Frey K, VanDrunen M, Sheikh T, DiPinto D, Mason R, Smith T. Motion of the diaphragm in patients with chronic obstructive pulmonary disease while spontaneously breathing versus during positive pressure breathing after anesthesia and neuromuscular blockade. Anesthesiology 2002;97(2):298-305.

[32] Westerdahl E, Lindmark B, Almgren S, Tenling A. Chest physiotherapy after coronary artery bypass graft surgery: a comparison of three different deep breathing techniques. J Rehab Med 2001;33(2):79-84.

[33] Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta PsychiatrScand 1983;67(6):361-370.

[34] Bjellan I, Dahl AA, Haug T. The validity of the hospital anxiety and depression scale: an updated literature review. J Psychosom Res 2002;52(2):69-77.

[35] Jones PW. St. George's Respiratory Questionnaire: MCID. COPD 2005;2(1):75-79.

[36] Bestall JC, Paul EA, Garrod R, Garnham R, Jones PW, Wedzicha JA. Usefulness of the Medical Research Council (MRC) dyspnoea scale as a measure of disability in patients with chronic obstructive pulmonary disease. Thorax 1999;54(7):581-586.

[37] 37.Anon. EuroQol: a new facility for the measurement of health-related quality of life. The EuroQol Group. Health Policy 1990;16(3):199-208.

[38] Rutten-van Mölken MP, Oostenbrink JB, Tashkin DP, Burkhart D, Monz BU. Does quality of life of COPD patients as measured by the generic EuroQolfive dimension questionnaire differentiate between COPD severity stages? Chest 2006;130(4):1117-1128.