

Effect of Pranayama on COPD Patients: A Review

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Abstract: -

The aim of this Narrative review article is to know about the use of pranayama for managing COPD to determine if sufficient evidence indicate that the usage as a therapy. A search for last 20 years studies involving pranayama and COPD in the PubMed, Embase and Google scholar yielding three reports. These Studies reported the benefits of Pranayama in the Physical (Exercise capacity) and mental health (Quality of life) of COPD patients, suggesting that pranayama is useful add-on therapy for COPD patients. However, each and every study showed some limitations with respect to sample size, study design, and duration of yoga intervention, assessment tools and statistical methods used. Hence, available evidence on pranayama indicates physical and mental benefits. However, elaborate analysis and supplementary studies are necessary to verify these observations.

Keywords: - Pranayama, COPD, chronic obstructive pulmonary disease, yoga, review.

Introduction: -

Chronic obstructive pulmonary disease (COPD) is the leading cause of death and disability in the world. It is the 3rd leading cause of mortality and morbidity in the world.¹⁻³ It is caused by sickness performance such as inactive lifestyle, and corrupt diet and cigarette smoking.⁴

COPD is characterized by non-reversible airflow obstruction and intermittent exacerbations. In spite of Development in pharmacologic and surgical treatments, many patient's lasts to suffer from dyspnoea and considerable limitations in daily actions. They are frequently stuck in a vicious cycle of inactivity, initiated by breathlessness.⁵⁻¹⁰

Determining the risk of death in COPD has been better determined using multidimensional indices, such as the BODE (body mass index, FEV1, dyspnea, and exercise capacity), the ADO (age, dyspnea, and FEV1), and the DOSE indexes (dyspnea, FEV1, smoking status, and, exacerbation frequency) slightly than using the definitive unidimensional information provided by the FEV1.¹¹⁻¹³

The word yoga means 'union': union of mind, body and spirit - the union between us and the intelligent cosmic spirit of creation- 'the oneness of all things'. Recent scientific studies have shown the helpful role of yogic exercises in supervision of COPD. Role of yogic exercises in supervision of cardiac diseases, diabetes, chronic pancreatitis, depressive disorders, epilepsy, osteoarthritis, multiple sclerosis, even for tuberculosis and pleural effusion have been reported, the five principles of yoga are relaxation, exercise (asanas), pranayama (breathing control), nourishing diet, and positive thinking and meditation, Pranayama are yogic breathing techniques that increase the capacity of lungs. help to reinforce the internal organs, improve mental control and excavate your aptitude to relax. According to yogic belief, lifespan is linked to the frequency of respiration if we can learn to slow down our breathing, we can add years to our lives. Yogic breathing or pranayama is part of all yoga's and is one of the practices of kundalini yoga. It is the art of controlling the breathing. When patients with COPD were non-specifically trained the strength of both the inspiratory and expiratory muscles was increased, with beneficial effects on exercise performance and quality of life. In the present study, we have recorded the effects of Pranayama in patients with severe COPD based on the pulmonary function parameters, blood gases, symptoms, activity and impacts scores of the patients.¹⁴⁻³²

Methods: -

Data Sources: -

A systematic search on PubMed, Embase, and Google scholar was done on 01/01/2021 at the library of AIIMS, Rishikesh. Search terms "yoga AND COPD", "Yoga AND Chronic obstructive pulmonary disease", "Pranayama AND COPD" and "Pranayama AND Chronic obstructive pulmonary disease" were used according to the search strategy of each database. The search was done by two authors independently and each article was checked for eligibility by reading the abstract.

Study Selection: -

The inclusion criteria were: 1) All controlled trials published during 2001-2020 with full text in English were eligible; 2) COPD patients of age group 18-75 years, diagnosed according to GOLD guidelines were eligible. Patients having other co-morbidities made no restriction in the eligibility; 3) Pranayama as an individual technique for COPD patients including at least one from pranayama according to yogic theory.4) Outcome measures - For eligibility, the studies must have included at least Mental Health & Physical Health as primary or secondary outcomes; 5) Human studies; and 6) English language.

Current Evidence for Yoga as Therapy: -

Studies evaluating the effectiveness of Pranayama to treat COPD suggests pranayama is generally safe and beneficial.

Gupta.A.et.al (2014) explore the effect of 12 -week pranayama (suryabhedana, nadishuddhi, bhramari, and kapalbhathi,) on BODE Index, CAT Score, FEV1,6MWT in patients with COPD, in Haryana, India. 50 patients of both genders and ages (30-60 years) participated in this study with an allocation ratio of 1:1 for 12 weeks. The pranayama group received the intervention twice a day till 12 weeks and the control group received standard medical treatment only. In the CAT score they show significant improvement occurred (21.2 ± 2.6 - 17.4 ± 2.5 , $P < .001$) the impact level moved from high to medium. Also it shows a significant improvement in the 6 min walk test occurred (257.1 ± 0.5 - 251.1 ± 38.1) but the FEV1 and BODE Index did not show any significant improvement. This study suggests that Pranayama will be used safely as an adjunct to usual treatment for COPD patients in terms of exercise capacity and CAT Score.

34

Katiyar. S.K. et.al (2006) assessed the effect of pranayama (Bhastika Pranayama 'Kapalabhati Pranayama Vhasya pranayama, Anulom-Vilom pranayama, Bhramri pranayama and Udgeedh pranayama) on Spirometry, ABG, 6MWT was done and SGRQ scores in active COPD patients. 48 North Indian COPD patients were enrolled with the age group of <40 years ,unwilling to give consent, cardiac disease, poor compliance, a requirement for supplemental oxygen therapy, recent hospitalization or CO₂ retention (Paco₂ > 50 mm Hg), history or spirometric evidence of asthma, evidence of cor pulmonale, abnormal liver, renal or hematological profile were excluded from the study. In this study, using computer generated randomization used. In the pranayama group training induced changes were greater for following variables increase of FVC (% predicted) from 68 ± 4.2 to 72 ± 3.9 ($p=0.11$), FEV1 (% predicted) from 48 ± 2.4 to 52 ± 2.1 , ($p=0.15$), PEF (% predicted) from 24.2 ± 0.9 to 30.1 ± 0.8 ($p < 0.05$), 6 MWT from 262 ± 38 to 312 ± 47 m ($p < 0.05$). The study show decrease in symptom score, activity score, impact score and total score in the intervention group. The study concludes that pranayama may be a cost-effective adjunct mind-body intervention that helps in achieving positive effect on patients with moderate-to-severe COPD. There was improvement in the lung function parameters.³⁵

Kaminsky.D. A. et.al (2017) evaluated the 6MWD, FEV (% predicted), IC, RV/TLC, mMRC score, CAT, BODE index, of pranayama intervention on 43 patients with COPD for 3 months (half an hour till 3 months). An independent assessor allocated the 21 patients in one group 22 in another group. Where 6-min walk distance (6MWD) as the primary outcome and Secondary outcomes included changes in lung function, markers of oxidative stress and systemic inflammation, and measures of dyspnea and quality of life at baseline and 12 weeks. The 6MWD increased in the pranayama group (least square mean [95% confidence interval] = 28 m [-5 to 61]) and decreased in the control group (-15 m [-47 to 16]), with a nearly significant treatment effect ($p = 0.06$) in favors of pranayama. Pranayama also resulted in small improvements in inspiratory capacity and air trapping. Both groups had significant improvements in various measures of symptoms, but no overall differences in respiratory system impedance or markers of oxidative stress or systemic inflammation. The study reports its safety and feasibility suggesting it to check on a large group.³⁶

Strengths and Limitation of Yoga Literature in COPD: -

There are few strengths and limitations of this reviewed studies:

Strength includes the use of 6 min walk test and improvement in CAT (COPD assessment Score, FEV1). They show how pranayama helps the COPD patients. They show that Pranayama will be used safely as an adjunct to usual treatment for COPD patients in terms of exercise capacity and CAT Score.

Limitation of the study are as follows: Observations were taken only at Baseline to 3 months. Longer follow up, and other study designs (longitudinal study, systematic reviews, narrative reviews, etc) will also be taken for further studies. Also searched on other search browsers like Scopus, web of science, etc. For better results, also take only COPD patients without co-morbidities.

Restriction about the particular form of pranayama for further evaluation. This review is restricted with one language because of available evidence and not getting funded by any organization. Many language studies also taken.

Conclusion: -

The current narrative review that pranayama might improve physical health (exercise capacity), mental health (Health Related Quality of Life), and lung function in COPD patients. So, pranayama should be encouraged as a potential and crucial approach to COPD. However, considering the limitations of our study, questions remain to be evaluated in large-scale, well-designed, multicentre, RCTs to substantiate the preliminary findings and investigate the long-term effects of pranayama. Pranayama have the potential to enhance lung function (FEV1) and exercise capacity (6 min walk test) and improve the mental condition which shows in the CAT Score in COPD patients.

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