

ABSTRACT

Background:

Consistent and predominantly significant association between occupational exposures and chronic obstructive pulmonary disease (COPD) is well established. Coal mine dust exposure can cause chronic airflow limitation in coal miners resulting in COPD. Most patients with COPD have impaired pulmonary function, higher levels of anxiety and depression, poor quality of life, insomnia, and chronic pain to a greater extent than the general population. Yoga is extensively used as a lifestyle strategy for both prevention and management of many psycho-somatic disorders. It has been reported that yoga helps in improving pulmonary and autonomic functions, diminishing depression and anxiety associated with other chronic diseases, but in COPD has not been fully investigated. Investigation of yoga based pulmonary rehabilitation in the management of COPD in coal miners is needed.

Aim:

This study aimed to evaluate the role of Integrated Approach of Yoga Therapy (IAYT) on respiratory, autonomic, physical and psychological parameters as well as health status of the coal miners with COPD.

Settings and Design:

Present study is a randomized, waitlist-controlled, single-blind clinical trial with two study arms; yoga and wait list control, conducted on coal miners of Rampur colliery, Brajraj Nagar, India.

Methods and Material:

A sample of 81 coal miners (36 - 60 years) with physician confirmed stable COPD (Stage II and III) were randomized into two groups. Both groups were either on conventional treatment

(control group) or combination of conventional care with integrated yoga program (yoga group). Yoga session was of 90 minutes that included asanas, pranayamas, breathing exercises, relaxation techniques and meditation six days a week for 12 weeks. Control group was wait-listed for yoga and given the same practices after 12 weeks if they subsequently wished to participate.

Assessments:

Measurements of pulmonary function test by spirometry, Peak Expiratory Flow Rate (PEFR) on Wright's mini peak flow meter, dyspnoea and fatigue on a modified Borg scale, exercise capacity by the six minute walk test, peripheral capillary oxygen saturation (SpO₂%), and pulse rate using pulse oximetry, Blood pressure with sphygmomanometer were made at the beginning and the end of the 12 weeks yoga intervention. Standardized questionnaires; COPD Assessment Test (CAT), Beck Depression Inventory (BDI) and State and Trait Anxiety Inventory (STAI) were used to assess their health and psychological status.

Statistical analysis:

Statistical analysis was performed using SPSS version 18.0. After ascertaining the normality of data, paired t-tests were used to determine significance of variable differences before and after the intervention. Means of the both groups were compared for all variables using Student's t-test. Categorical variables were analyzed using the Chi - square test. The level of statistical significance was set at $P < 0.05$ for all tests.

Results:

Statistically significant ($P < 0.001$) improvements in Forced Vital Capacity (FVC), Forced Expiratory Volume at 1 sec (FEV₁), PEFR, 6-min walk distance, sleep quality and SpO₂% and

significant ($P < 0.001$) reductions in CAT scores, dyspnoea, fatigue, depression, anxiety, blood pressure (systolic), blood pressure (diastolic), pulse rate, respiration rate and pain were observed within the yoga group after intervention. Whereas, FEV₁/FVC and FEF could not reach the statistical significance though it showed a positive trend towards improvement in yoga group. No significant pre-post changes were observed in the control group ($P > 0.05$). Independent sample t-test showed significant differences between the post scores of the groups ($P < 0.001$).

Conclusions:

The results of this study showed that offering a 12-week yoga program for coal miners with COPD lead to greater improvements in respiratory, autonomic and psychophysiological parameters than conventional care. Yoga interventions hold promise to relieve symptoms of COPD effectively by counteracting related emotional stress and fight-or-flight physiological responses. Additional clinical trials of yoga are needed to provide stronger evidence of their effectiveness. Yoga seems to be a safe, feasible and effective treatment modality that clinicians can consider including as an adjunct to conventional therapy for pulmonary rehabilitation programs for COPD patients.

Key words: Anxiety, COPD, Depression, Dyspnoea, Exercise capacity, Fatigue, Health status, Sleep quality, Yoga