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EFFICACY OF QIGONG EXERCISES ALONG WITH BOX BREATHING FOR MALE SMOKERS WORKING IN COTTON INDUSTRY

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Abstract: **Backround and objectives: Occupational exposure to cotton dust and cigarette smoking significantly contribute to respiratory symptoms and reduced lung function among cotton industry workers. Cotton dust contains mixed organic and inorganic particles that can lead to chronic bronchitis, obstructive airway diseases, and byssinosis. Complementary therapies like Qigong and box breathing help improve respiratory function by strengthening respiratory muscles and regulating breathing patterns. This study aimed to assess the effectiveness of combining Qigong exercises and box breathing in enhancing lung function among male smokers in the cotton industry.**

Methods: A total of 15 male workers aged 25–40 years, with at least five years of work exposure and a smoking habit, were selected through convenient sampling. Participants underwent Qigong and box-breathing training for 40 minutes, four days per week, for eight weeks. Pre- and post-intervention assessments of Maximum Inspiratory Pressure (MIP), Maximum Expiratory Pressure (MEP), and FEV1/FVC ratio were measured using a respiratory pressure meter and spirometry.

Results: Statistical analysis using a paired t-test showed significant improvements in FEV1/FVC (t=14.3), MIP (t=14.4), and MEP (t=17.6), all exceeding the table value of 2.145 at $p<0.05$.

Conclusion: Qigong combined with box breathing is effective in improving respiratory muscle performance and pulmonary function in smokers exposed to cotton dust.

Keywords: **Qigong, Box Breathing, Cotton Dust, Smokers, Lung Function, Respiratory Muscle Strength, FEV1/FVC, Occupational Exposure, COPD.**

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1. INTRODUCTION

The Occupational exposure is one of the primary causes of respiratory symptoms and lung function impairment (1). According to world health organization (WHO) estimates, pulmonary disease is predicted to become the third leading cause of death in 2020. previous studies have demonstrated that 15% to 20% of chronic obstructive diseases pulmonary disease (COPD)causes are caused by occupational exposures (2). However, a recent study found limited evidence for an association between COPD and occupational exposure. Besides occupational exposure, cigarette smoking is a widespread habit globally and is a major contributor to respiratory issues and reduced lung function. The World Health Organization (2012) reports that over one billion people are addicted to nicotine. Smoking is prevalent across all segments of society, including the working class (3).

As word related wellbeing has been included in National Wellbeing Arrangement, with this mission Government of India had propelled different "National Programs for Control and Treatment of Word related infections" in 1998-2002 for this the National Established of Word related Wellbeing, Ahmadabad (ICMR) has been distinguished as the nodal office. With 58% work is in India is horticulture based, and cotton is one of the fundamental cash crops, India is one of the biggest makers of cotton material merchandise worldwide.

The processes of ginning, spinning, and weaving in the cotton industry produce significant amounts of cotton dust. This dust contains a mixture of particles of varying sizes and types, including plant debris, fibers, bacteria, fungi, soil, non-cotton materials, and other pollutants. Inhalation of cotton dust can lead to various respiratory issues such as coughing, sputum production, wheezing, shortness of breath, chest tightness, chronic bronchitis, chronic obstructive pulmonary disease (COPD), and byssinosis. It also has a considerable impact on lung function. Byssinosis, a chronic respiratory condition, primarily affects individuals exposed to cotton dust in the workplace. The development of respiratory diseases linked to occupational dust exposure is influenced by factors such as dust type and concentration, duration of exposure, and genetic predisposition. Moreover, working in areas with higher dust levels, such as spinning and weaving departments, and advancing age have been identified as risk factors for cotton dust-related respiratory conditions.

Qigong encompasses a wide variety of practices that involve specific body postures, movements, breathing techniques, and visualizations aimed at treating illness and promoting overall health. According to the National Qigong Association, “qi” refers to “vital energy,” while “gong” signifies “a skill developed through consistent practice.” There are various forms of qigong, some centered on health and healing, others focused on martial arts or spiritual development. Qigong may serve as a beneficial complementary therapy for alleviating respiratory symptoms and strengthening the respiratory muscles, particularly among individuals employed in the cotton industry. Qigong, an ancient Chinese health technique, has been utilized for hundreds of years in China to help people with respiratory, autonomic, and immune system issues (4).

Effective Qigong training is positively impacting health outcomes. Qigong enhanced lung function (i.e., FEV1, FEV1/FVC, and FEV1/pre), indicating airway obstruction and the severity of disease. The results of the analysis indicated that Qigong may significantly enhance lung function; this improvement can strengthen respiratory muscles, decrease pulmonary residual volume, increase gas exchange efficiency, and improve the lung function.

Box breathing is a powerful, yet simple, relaxation technique that aims to return breathing to its normal rhythm. This breathing exercise may help to clear the mind, relax the body, and improve focus. The technique is also known as “resetting the breath” or four-square breathing (5). Box breathing is advantageous for individuals of all ages and skill levels, but this deep breathing method is especially helpful if you aim to enhance your meditation routine or decrease your stress levels. The box breathing method is especially beneficial for individuals with respiratory conditions like asthma or chronic obstructive pulmonary disease (COPD). The advantages of this exercise are that it doesn't overly relax. Since the inhalation and exhalation are equal, the method harmonizes your nervous system – excellent when you're on the go and need to calm and concentrate your body and mind. It is a breathing method that calms and slows your breathing pattern. It functions by diverting your attention while you count to four, soothing your nervous system, reducing stress throughout your body, and enhancing respiratory strength. It aids in decreasing breathlessness and dyspnea while enhancing respiratory muscle strength. It is primarily beneficial for individuals employed in the cotton industry.

2. MATERIALS AND METHODOLOGY

The purpose of the investigation is to determine the effectiveness of qigong exercises along with box breathing for male smokers working in cotton industry.This study had 15 male workers included with 25 to 40 years of age and they are working in cotton industry and habit of smoking in all, and each participant gave written informed consent prior to participation.

Workers with Non-smokers, history of unstable heart conditions, chest wall deformities, active infections like tuberculosis, trauma to spine or any other neurological problems, less than five years of employment in their current job were excluded in the study.15 male subjects underwent qigong exercises (6) along with box breathing exercise up to 8 weeks in duration.

3. PROCEDURE

The subjects were chosen using a convenient sampling technique. Fifteen subjects who met the inclusion and exclusion criteria performs qigong exercises along with box breathing 4 days a week for 40 minutes each for 8 weeks, includes with warmup, intervention and cool down period. The pretest and posttest values are taken by using Respiratory pressure meter for Maximum Inspiratory Pressure(MIP) and Maximum Expiratory Pressure(MEP) and using spirometry for FEV1/FVC.

1. **BOX BREATHING TECHNIQUE** -*long sitting with pillow support*

PROCEDURE: Ask the patient to keep one hand in chest and another hand in abdomen. breath in through the nose counting for 4 seconds. hold breath for 4 seconds. slowly exhale through mouth for 4 seconds

2. **QIGONG EXERCISES**

- WAVE BREATHING - *Comfortable sitting position*

Close the eyes. Slowly inhale through nose, fill your nose with air, and gently out through mouth, and feel relaxed belly .Place your finger on the start of the first wave. When the wave goes up, take a deep breath in. When the wave goes down, breath out. Trace your finger along the waves and continue to slowly breathe in and out.

- COUNTING BREATH - *Standing*

Breath out through mouth. Emptying the lungs of air. Close your lips and inhale through your nose for a count of four. Hold breath for a count of seven. Exhale completely through mouth making a whoosh sound for a count of eight.

- PAUSE BREATHING - *Sitting*

Elongate spine to maintain an upright posture. Relax the respirational muscle. Breath normally for a few minutes. After a relaxed exhale, hold breath. Use index and thumb finger to plug nose. Retain breath until feel the urge to breathe, which may include an involuntary movement of diaphragm, and then inhale. Breath normally for at least 10 seconds.

- DAN TIAN - *Standing*

Hands in front of the body fingers open palms facing towards the face. Breath in hands comes down towards the chest and turning palms down continue breathing. And turn the palms come up to the chest and breath out.

- FILLING BREATHING – *Standing*

Start by breath in slowly through nose, allow breath to fill the lower abdomen first. Then, let it fill upper abdomen, followed by the lungs. Exhale in reverse release air slowly through the nose.

The research was to determine the efficacy of qigong exercises along with box breathing in male smokers working on cotton industry. 15 subjects were chosen for this research keeping selection criteria in mind treated for 8 weeks. The statistical test revealed that the calculated ‘t’ value by applying Paired ‘t’ test for FEV1/FVC 14.3, for MIP 14.4, for MEP 17.6respectively was higher than the table value of 2.145 with $p<0.05$.

Hence, the outcome of this research indicates that there were improvements in the subjects performing qigong exercises along box breathing exercise.

4. RESULT

The statistical analysis showed that the calculated ‘t’ value using the Paired ‘t’ test for FEV1/FVC 14.3, for MIP 14.4, for MEP 17.6 respectively which was greater than the table value of 2.145 with $p<0.05$.

5. DISCUSSION

Increased exposure to cotton dust and Cigarette smoking substances which leads to respiratory disease like asthma, obstructive disease and cardiopulmonary diseases. This may lead to wheezing, frequent cough, with or without sputum, breathlessness and reduced endurance of respiratory muscles and also affects the chest expansion. Box breathing and qigong exercises play a vital role in respiratory movement responses, improve rate and depth of respiration and increase in inspiratory volume and respiratory movement responses, making it possible to maintain more efficient, deep and slow breathing pattern.

By integrating the mind and body through particular movements, breathing exercises, and meditation, Qigong is a valuable addition to physical exercise for people with COPD. It can help patients manage their energy (gi) and improve their physical, mental, and spiritual well-being (7). As the disease progresses, patients with COPD have greater dyspnea and decreased exercise ability due to lung function insufficiency. Sufficient Qigong instruction may help to enhance health results. According to our study, Qigong enhanced lung function, as measured by FEV1, FEV1/FVC, and FEV1, which indicated the degree of illness and airway blockage. The PQE (Pulmonary Qigong Exercises) significantly improved exercise capacity and activity of life, however, the effects on skeletal muscle strength, lung function, and physical activity are unclear. So, this trial aims to further evaluate the effects of PQE in COPD-stable patients using multidimensional outcomes (8).Positive impacts could include the requirement for precise breathing and movement coordination in traditional Chinese exercises, where the diaphragm is raised by deep, slow abdominal breathing. In order to accomplish this coordination, intentionally guided respiration is frequently employed during the movements. Alveolar ventilation rises as a result of this mechanism, which dramatically enhances chest expansion and retraction which leads to increased alveolar ventilation.Compared to healthy controls, COPD patients who practiced Liuzijue Qigong had significantly greater improvements in lung function (FEV_1, FEV1%, FEV_1/FVC), exercise capacity (6MWD, 30-s SST), health status (CAT score, mMRC dyspnea scale, MRC dyspnea scale, TCM syndrome scores) and mental status (HAMA, HAMD, SGRQ).

The cotton materials segment is the moment biggest supplier of business after horticulture. In this manner, Indian Materials Industry has an overpowering nearness in the financial life of the nation. In this way, the development and all circular advancement of this industry has a coordinate bearing on the change of the economy of the nation.6-8. The specialists in the blowing, carding, weaving and turning zones are continually uncovered to most noteworthy levels of cotton clean. The pneumonic capacities of these specialists are impeded in the frame of tidy (Chest snugness, inveterate bronchitis, hack and dyspnea). Most of these specialists are uneducated and from destitute financial foundation and are too routine to smoke which is known cause of chronic obstructive aspiratory malady (COPD). The comes about of the show consider demonstrate essentially values of VC, FEV1, MVV (lit/min) in cotton turning specialists as spirometry was the fundamental parameter of lung work. The level of centralwere of changed lung capacities in smoking specialists was much higher than those in nonsmoking laborers proposing association of bigger aviation routes.

Box breathing work out is a strategy of moderate breathing beat too known as square breathing utilized all around. It increases the execution and concentration level; it moreover acts as an effective push alleviation. It is tried with a spirometer for the lung work test that measures the wind stream of the upper and lower respiratory tract. This strategy builds up carbon dioxide in blood which calms down and controls the ANS (Autonomic Anxious Framework), which upgrades the cardio-inhibitory reaction of the vagus nerve that progresses the disposition(9). The primary point of the think about was to analyze the impact of box breathing strategy on lung work Materials and Strategies: The show consideration was carried out among the members at the age of 18-25 a long time from Savitha Dental College. A add up to of 30 members were included in this ponder (15 guys, 15 females). The exploratory preparing methods comprised of 2 sessions of box breathing day and night for a period of 30 days (10).

Shu-ting Liu, Chao Zhan 2021 Our investigation of population-based RCT considers illustrated the viability of Qigong in patients with COPD. Compared to solid controls, COPD patients who practiced Qigong had altogether more noteworthy advancements in lung work (FEV1, FEV1%, FEV1/FVC), work out capacity (6MWD), wellbeing status (CAT score, MRC dyspnea scale, MRC dyspnea scale, TCM disorder scores) and mental status (11). Qigong was moreover related with an expanded AC and PaO2, as well as a lower PaCO2. Hence, when utilized as an aide treatment, Qigong may progress lung work, work out capacity, well-being status, mental status and quality of life in patients with COPD (12). We accept that these comes about may encourage treatment arranging and educate the improvement of ideal treatment conventions for patients with COPD. Qigong is simple to learn and can be utilized to coordinated physical exercises and mental treatment. Besides, it does not require the utilize of extraordinary gear or a particular setting. The comes about of our meta-analyses show that Qigong can successfully make strides pneumonic work, work out capacity, wellbeing status, mental status and respiratory parameters in patients with COPD. Be that as it may, it did not reflect that as the intercession time increments (≥ 6 months), all of result pointers had a way better upward.

Population specificity and size, Exposure heterogeneity and Short duration follow-up are limitations of the study. Recommend this study for inclusion of a comparative (active) control group, long-term follow-up and intensity or dosage response analysis.

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