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Effect of classical yoga on forced vital capacity among middle-aged women pneumoconiosis sufferers

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Abstract---In this study, 120 middle-aged lung-affected patients were selected at random, observing random sampling method, screened, and further reduced to 40 with their Chest X-ray, from a fireworks factory at Sivakasi, Tamil Nadu, between 35 to 50 years of age. Women were grouped into an experimental and control group of 20 each. The hypothesis was fixed that there would be a positive impact on Forced Vital Capacity among middle-aged women suffering from pneumoconiosis due to yogic practices. The Experimental Group underwent therapy for 12 weeks one hour each day. The control group was allowed to lead a normal life. The data collected from the groups were statistically analyzed by Analysis of Variance (ANOVA). The result of the study showed that Forced Vital Capacity was improved significantly due to regular Yogic practices. The hypothesis was accepted at a 0.05 level of confidence.

Keywords---Yoga, Yoga therapy, Pneumoconiosis, Forced Vital Capacity, Middle-Aged Women.

Introduction

Yogic therapy is ancient medicine. Yogic practices make aware of body posture, alignment, and movement patterns. It gives flexibility and helps to lead a healthy life. Pneumoconiosis inflames and narrows the airways. Pneumoconiosis causes recurring whistling sounds when breathing, chest tightness, shortness of breath, and coughing. There are many types of Pneumoconiosis. Allergens are any substances, the body treats as a foreign body, triggering an immune system. They are widely between individuals and often include animal proteins, fungi, pollen, house dust mites, and other forms of dust in a fireworks factory. Women working there get allergen due to dust, and the smoke of the waste chemicals. The airway cells are sensitive. Cough-induced Pneumoconiosis is one of the toughest Pneumoconiosis

The disease has different forms, depending on the type of dust inhaled. They are black lung disease (miner's lung), brown lung, and dust from cotton or other fibers. Other types of dust that causes pneumoconiosis to include silica and asbestos. The compound used to give movie popcorn its buttery flavor, leads to popcorn lungs.

Objective of the Study

The study aims to assist fire workers with their occupational disease of Pneumoconiosis with traditional yoga therapy.

Hypothesis

Hypothesized that there would be a significant difference in Forced Vital Capacity count among Pneumoconiosis affected fire workers due to yogic therapy than in the comparative group.

Inclusion Criteria

1. The subjects were delimited to women between 35 to 50 years of age only.
2. The subjects were delimited to women fire workers from Sivakasi, Tamil Nadu, India only.
3. The variant was Forced Vital Capacity only.
4. The independent variable was yoga therapy only.

Exclusion Criteria

1. The extreme lung disorders conditions, climatic conditions, lifestyle, diet taken, and medications taken were not considered.
2. The Socio-Economical status was excluded.
3. Routine activities of patients were not taken into account.

Review of Related Literature

Jordan Minov (2017): Exposure to occupational agents is a well-known cause of respiratory impairment. Occupational lung diseases (OLDs) cover entire spectrum of respiratory diseases ranging from asbestos-related diseases (ARDs) , silicosis, coal workers' pneumoconiosis (CWP), and byssinosis to chronic obstructive pulmonary disease (COPD), hypersensitivity pneumonitis (HP), asthma, lung cancer and pleural mesothelioma. The contribution of OLDs to morbidity and

mortality in the general population has changed quantitatively and qualitatively over the years. Pneumoconiosis related to dust exposure in the industries such as underground mining dominated at the beginning of the past century. Over the last decades in the developed countries there is a shift from pneumoconiosis due to asbestos and silica exposure to work-related obstructive lung disease such as occupational asthma and COPD. In the same time, the contribution of the effects of exposure to some agents (e.g. asbestos) to morbidity and mortality is still rising due to long latency period between exposure and manifestations of the disease. The disease burden of a population, as well as its distribution across different subpopulations (e.g. adolescents, women, aged workers, etc.) are important for defining strategies and designing protective measures to reduce workplace risks and improve population health. Epidemiological studies of OLD have been conducted for more than a century. The monocausal diseases such as silicosis and ARDs are almost exclusively associated with occupational exposure and trends over time and the distribution of different industries and geographic areas can be evaluated efficiently through national registries of occupational diseases. On the contrast, for multicausal diseases such as occupational asthma, COPD and lung cancer, reliable information can only come from well-designed epidemiological studies. The lungs possess a limited repertoire of patterns of pathologic responses and disease manifestations which are common to lung disease from both occupational and other causes. Except in etiology, there are no differences in histological changes, diagnostic approach and therapeutic modalities between occupational and non-occupational lung diseases. As OLDs are potentially preventable, prevention efforts are of a great importance. These diseases are, in principle, easier to prevent than diseases caused by genetic factors, lifestyle factors, or by the general environment. It is easier to intervene legally and technically in the work environment than in personal habits (such as smoking) or in major societal issues (such as transport). Besides this, OLDs still remain a substantial proportion of overall lung diseases and a great challenge for public health at global level.

Surya Kant (2015 Nov) A total of 276 subjects of mild-to-moderate persistent asthma ($FEV_1 > 60\%$) aged between 12 to 60 years were recruited from the Department of Pulmonary Medicine, King George's Medical University, Uttar Pradesh, Lucknow, India. They were randomly divided into two groups, 'the yoga group' (with standard medical treatment along with yogic intervention) and 'the control group' that received standard medical treatment (without yogic intervention). At completion of 6 months of the study period 35 subjects were dropped out, so out of 276 subjects, only 241 subjects completed the study (121 subjects from yoga group and 120 subjects from control group). Day time symptom, night time symptom and total symptom score improved significantly in both groups but the improvement was achieved earlier by 'the yoga group' in comparison to 'the control group'. No significant changes were found in spirometrical variables in the control group during the course of the study. 'Between group differences' were found to be highly significant with better improvements in FVC, FEV_1 , and FEV_1/FVC and PEF. In yoga group, the significant improvements were found in the proportion of hemoglobin and superoxide dismutase activity in comparison to control group and significant decrease was found in total leukocytes count and differential leukocytes count in comparison to control group. The yoga group got significantly better improvement

in symptom scores, pulmonary functions and biochemical variables. Result shows that yoga can be practiced as an adjuvant therapy along with standard inhalation therapy for better management of asthma.

Results and Discussions

The data of Forced Vital Capacity collected from both the groups before and after the intervention was statistically analyzed by using Analysis of Variance (ANOVA). The significant difference was tested at 0.05 level of significance.

Results on forced vital capacity

In this study, 120 middle-aged lung-affected patients were selected at random, observing a random sampling method, screened, and further reduced to 40 with their Chest X-ray, from a fireworks factory at Sivakasi, Tamil Nadu, between 35 to 50 years of age. Women were grouped into an experimental and control group of 20 each. The hypothesis was fixed that there would be a positive impact on Forced Vital Capacity among middle-aged women suffering from pneumoconiosis due to yogic practices. The Experimental Group underwent therapy for 12 weeks one hour each day. The control group was allowed to lead a normal life. The data collected from the groups were statistically analyzed by Analysis of Variance (ANOVA).

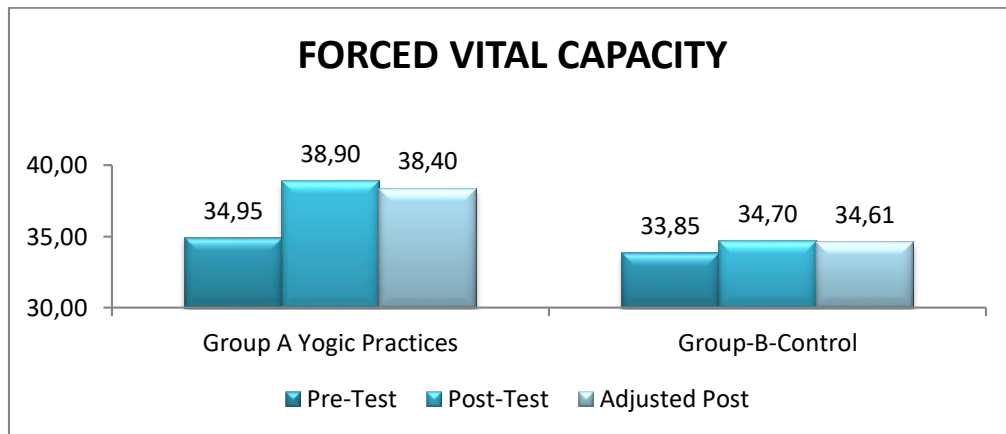
Table – I
Analysis of variance of the means of experimental group and
The control group in forced vital capacity

Test	Exptl group	Cont group	Source of variance	Degree of freedom	F-Ratio
Pre test	34.95	33.85	between	1.00	1.63
			within	38.00	
Post test	38.90	34.70	between	1.00	9.72
			within	38.00	
			within	27.00	

*Significant at 0.05 level of confidence. (Table F-ratio at 0.05 level of confidence for 1 and 38 (df) =4.2, 1 and 37 (df) =4.21)

Table I shows an “F” ratio of pre-test was 0.01*, which indicates a statistically not significant 0.05 level of confidence. Whereas the “F” ratio of post-test was 98.36, which indicates a statistically significant difference among the post-test means at a 0.05 level of confidence. The obtained F-ratio value was 98.36, which was higher than the table value of 4.21. The above study was substantiated by Jordan Minov (2017).

Bar diagram showing the mean difference among Experimental Group
And Control Group of Forced Vital Capacity



Significant at 0.05 level of confidence. (Table F-ratio at 0.05 level of confidence for 1 and 38 (df) =4.2, 1 and 37 (df) =4.21)

Discussion on Hypothesis & Conclusion

From the above analysis, traditional yogic therapy improved Forced Vital Capacity and thus was more successful in resolving pneumoconiosis, than the control group. The result presented in the above Table and Graph proved that the hypothesis was accepted at a 0.05 level of confidence. Hence, yoga therapy is beneficial to middle-aged women suffering from pneumoconiosis.

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