



ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 5.2
IJAR 2020; 6(8): 359-361
www.allresearchjournal.com
Received: 19-06-2020
Accepted: 20-07-2020

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Effect of slow suryanamaskar on pulmonary functions in 10-15 years old school going children at the end of 4 weeks: An experimental study

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Abstract

Objective: To find the effect of slow Suryanamaskar on Peak expiratory flow rate in 10-15 year old school going children at the end of 4 weeks.

Background: Non specific chronic low back pain (NSCLBP) is defined as low back pain not attributable to recognizable known specific pathology and which persists for 12 weeks or more. NSCLBP is defined as pain, muscle tension, or stiffness localized below the costal margins (ribs) and above the inferior gluteal folds. Pilates method was developed by Joseph H Pilates which emphasizes recruitment and strengthening of the core muscles, flexibility and breathing to promote stability and control of movement. It focuses on maintaining a neutral spine, pelvic and spinal stability. Conventional exercises therapy is a management used widely in low back pain. It includes dynamic strengthening exercises which activates extensor and flexor muscle groups.

Outcome Measure: Mini Wright Peak Flow Meter

Method: The study included 65 subjects both males (4) and Females (61). Training was given to them for a total period of 4 weeks.

Result: The PEFR values were improved with pre-test mean of 259.89 to 284.61 with a SD of 53.64 to 51.97.

Conclusion: This study concludes that slow suryanamaskar technique is effective in improving peak expiratory flow rate (PEFR) in 10-15 year old school going children at the end of 4 weeks.

Keywords: Slow Suryanamaskar, school children, peak expiratory flow rates

1. Introduction

Suryanamaskar is an ancient yogic technique which links 12 asanas are performed in sequence of one after the other. It includes asanas ordered in a way that they alternatively stretch the spine backwards and forwards. Each asana is moved into with alternate inhalation and exhalation. A number of studies on yoga practice have shown an overall improvement in the cardiorespiratory parameters.

Suryanamaskar includes 12 poses that are, pranamaasanas (prayer poses), hastta uttasana (raised arm pose), padahasthasana (hand to foot pose), ashwa sanchalaaasana (equestrian pose), paarvatasana (mountain pose), ashatang namaskar (eight limb salutations), Bhujangasana.

Slow Suryanamaskar (SSN) training improves the strength of both expiratory and inspiratory muscles. The different postures of SSN involve isometric contraction and chest wall expansion which may be improving strength of the intercostals muscles [1]. An improvement in respiratory muscle strength, increase in the excursion of diaphragm, as well as increased thoracic compliance has been seen with regular practice of suryanamaskar [2].

Peak expiratory flow rate is an individual's maximum speed of expiration as measured with peak flow meter. Peak flow meter readings are high when patients are well and healthy, and lower when the airways are constricted or restricted or unhealthy.

From changes in reading of peak flow meter we can determine lung functionality, and therefore can also be used for prognostic as well as diagnostic purposes.

In school going children there are possible internal factors that cause postural dysfunction, and reduction in muscle strength and flexibility. The external factors like carrying heavy bag packs [3], lack of exercises, sedentary lifestyle also leads to the same.

An overall reduction in the growth may leads to decrease respiratory parameters and functioning.

A study showed lower control respiratory pressures could be due to the fact that our subjects were sedentary and were not involved in any sports or physical fitness activities ^[4].

In this age group of 10 to 15 years respiratory functions are in growing phase therefore an overall reduction of healthy life style leads to obesity reduce muscular strength and various other diseases, while practicing suryanamaskar on regular basis can keep the overall growing functions of the body healthy and provide beneficial effects on respiratory functioning.

2. Methodology

Study design - Experimental study

Study population - pre & post experimental study

Sample size - 65

Sampling method – Purposive

Study setting - School going children age 10-15 years

Study duration - 6 months

Treatment duration - 4 weeks

3. Inclusion Criteria

1. Healthy participants aged between 10-15 years.
2. Both males and females

4. Exclusion Criteria

1. Congenital heart diseases
2. Respiratory Diseases
3. Recent injuries to thorax
4. Active yoga or sports training

5. Outcome Measures

5.1 Peak expiratory flow rate (PEFR): PEFR is an objective measure of bronchopulmonary function. Mini wright Peak flow meter is the device used to measure PEFR. It is a small portable device with which on spot reading can be obtained.

Procedure to perform: Participants are asked to take a deep inspiration and then to forcefully with maximum effort are asked to blow out through the mouth piece into the instrument.

6. Sampling

Subjects were selected on the basis of inclusion and exclusion criteria.

7. Procedure

1. Presentation of synopsis to an ethical committee and approval was taken from the ethical committee.
2. Subjects were selected on the basis of the inclusion and exclusion criteria
3. The subjects were then explained about the study. Consent was taken from the school authorities and guardians/parents of those eligible and willing to participate in the study
4. Prior to the intervention the outcome measure for peak expiratory flow rate was taken by a mini wright peak flow meter.
5. Duration of protocol was of 4 weeks with treatment given 5 days/week.

8. Intervention

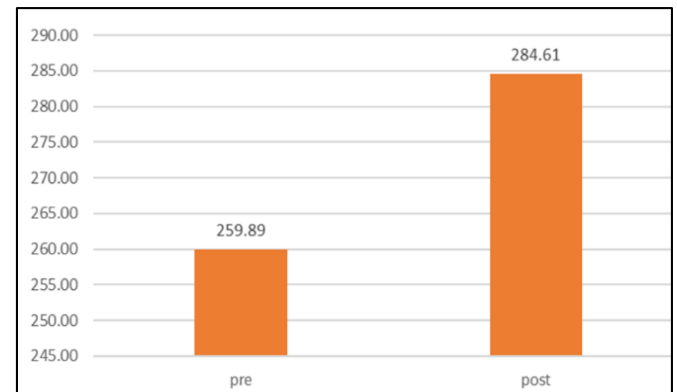
1. The participants were trained to perform slow Suryanamaskar in a manner so that each of the 12 poses are held for a duration of 30 seconds.

2. Each round took 6 minutes to complete and 5 repetitions were performed in 30-40 minutes.
3. No. of repetitions- 5
4. No. of sessions per week- 5

9. Data and Statistical Analysis

1. The Peak expiratory flow rate was analysed using mini wright peak flow meter.
2. The data was Prepared in Excel Spread sheet.
3. Data entered was analysed with the help of PRIMER version 7.
4. Paired t- test for pre & post treatment value was done.

PEAK EXPIRATORY FLOW RATE	PRE (L/MIN)	POST (L/MIN)
MEAN	259.9	284.6
STANDARD DEVIATION	53.64	51.97
p value	p<0.001 (considered significant)	
t value	t = 7.907	



Peak Expiratory Flow rate

10. Result

1. The PEFR values were improved with pre-test mean of 259.89 to 284.61 with a SD of 53.64 to 51.97
2. The finding of this study revealed a significant improvement in post intervention peak expiratory flow rate (PEFR) values at the end of 4 weeks.

11. Discussion

The objective of this study was to see the effect of Slow Suryanamaskar on pulmonary function in school going children at the end of 4 weeks.

For the study total 65 subjects fulfilling the inclusion criteria were selected from schools and nearby area out of which 5 were dropped out due to absenteeism. Thus, the data was carried out for 60 subjects.

Pre-treatment data was collected using mini wright peak flow meter. The treatment protocol was given for a total of 4 weeks and post treatment, same measures were recorded and results were drawn out.

A study by Jie ji *et all* suggest that there is a significant association between physical activity and lung function growth among girls aged 9–11 years. Physically active girls had significantly higher lung function and growth rates in lung function indices than physically inactive girls during an 18-month follow-up period ^[5].

Makwan *et al.* also showed increased FEV-1 after 10 weeks of yogic practice. The increase in FEV-1 might be due to significant increase in vital capacity [6].

A study by Joshi *et al.* reported significant increase in FVC and PEFr following 6 weeks of yoga which included pranayama and suryanamaskar [7].

According to the result of this study there was an effect of slow suryanamaskar on peak expiratory flow rate in 10-15 years old school going children at the end of 4 weeks.

Slow Suryanamaskar was aimed at improving the musculoskeletal strength, endurance and flexibility, thereby improving the pulmonary function in an healthy individual. It includes 12 poses. The first pose starts with relaxation of the body and mind. It induces calmness and increases concentration.

The 2nd and 11th pose are the same where there is slight extension of neck and trunk, it strengthens and tones the abdominal and chest musculature.

The 3rd and 10th pose helps improve the flexibility as it includes bending forward from the lumbar and thoracic spine and further trying to touch both hands to the floor. It also helps decrease excessive abdominal fat and is also beneficial for gastrointestinal tract and nervous system [8].

In, 4th and 9th, the equestrian pose, where the left leg is stretched back as far as possible, there is a stretch to the anterior lower limb musculature. It tones the abdominal muscles. Giving an overall flexibility and balance to the body.

Slow suryanamaskar also stretches the anterior chest wall muscles. Each pose in this is held for a period of 30 seconds. This hold of 30 seconds subjects the muscles to a stretch and an isometric contraction.

The stretch upon the intercoastal muscles reduces the stiffness and is often correlated with an increase in the respiratory muscle endurance [9].

The 30 second hold is a long duration of time in which the isometric contraction occurs therefore leading to an increase in the muscle endurance.

The overall effect been an increased expiratory and inspiratory pressures which in turn expands the chest wall cavity and improves lung compliance.

A study has also shown that when muscles undergoes a constant stretch it reflexively relaxes which leads to a decrease in the out of phase activity from stiff intercoastal muscle spindles which otherwise contributes to breathlessness, which is reduced and as a result of which the endurance could be improved [10].

The current study conducted on school going children over a period of 4 weeks revealed that there is an improvement in the PEFr, but there is no direct evidence to support the content that the improvement is due to an increase of muscle strength or muscle endurance of respiratory muscles.

Therefore, according to the study slow suryanamaskar can be incorporated in routine extra-curricular activities of school going children to maintain an optimal pulmonary function

12. Conclusion

This study concludes that slow suryanamaskar technique is effective in improving peak expiratory flow rate (PEFR) in 10-15 years old school going children at the end of 4 weeks.

13. Limitations

1. The study was done using Small sample size

2. Only few male subjects could be included

14. Future Scope of Study

The effectiveness of slow suryanamaskar on subjects with respiratory conditions can be studies.

15. References

1. Bhavanani AB, Udupa K, Madanmohan, Ravindra P. A comparative study of slow and fast suryanamaskar on physiological function. *Int J Yoga*. 2011; 4(2):71-76.
2. Sasi Kumar, Sivapriya, Shyamala Thirumeni. Effects of Suryanamaskar on cardio vascular and respiratory parameters in school students. *Recent Research in Science and Technology*. 2011; 3(10):19-24
3. Chow DHK, Ting JML, Pope MH, La A. Effects of backpack load placement on pulmonary capacities of normal schoolchildren during upright stance. *International Journal of Industrial Ergonomics*. 2009; 39:703-707
4. Berntsen, Sveinung, Wisløff, Torbjørn, Nafstad, Per *et al.* Lung Function Increases with Increasing Level of Physical Activity in School Children. *Pediatric exercise science*. 20. 402-10. 10.1123/pes.20.4.402, 2008.
5. Ji J, Wang SQ, Liu YJ, He QQ. Physical Activity and Lung Function Growth in a Cohort of Chinese School Children: A Prospective Study. *PLoS One*, 2013
6. Makwana K, Khirwadkar N, Gupta HC. Effect of short term yoga practice on ventilatory function tests. *Indian J Physiol Pharmacol*. 1988; 32(3):202-8.
7. Joshi LN, Joshi VD, Gokhale LV. Effect of short term 'Pranayam' practice on breathing rate and ventilatory functions of lung. *Indian J Physiol Pharmacol* 1992; 36(2):105-108.
8. Amit Vaibhav *et al.* Surya Namaskar (Sun Salutation): A Path to Good Health. *International Journal of Pharmacological Research*
9. Rafaela Barros de Sá *et al.* Immediate effects of respiratory muscle stretching on chest wall kinematics and electromyography in COPD patients. *Respiratory Physiology & Neurobiology journal*
10. Putt MT, Watson M, Seale H, Paratz JD. Muscle stretching technique increases vital capacity and range of motion in patients with chronic obstructive pulmonary disease. *Arch Phys Med Rehabil*, 2008.