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EFFECTS OF YOGA TRAINING AND DETRAINING ON PHYSICAL PERFORMANCE

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ABSTRACT

Purpose of the study was to evaluate the effect of yoga training and detraining on physical performance measures in pre-pubertal school going children. Subjects were randomized to two groups - yoga group and Physical exercise (PE) group after the baseline assessment. All the subjects were assessed for strength, endurance, whole body endurance through 20 meter shuttle and physical fitness, at 3 time points - Baseline, 3 months Post intervention and 3 months after detraining. The results suggest that the improvement in the physical performance is largely by the increase in the respiratory muscle strength in the yoga group. In conclusion, the study presents the efficacy of yoga to improve strength, endurance, whole body endurance and aerobic capacity with 3 months of training in the pediatric group. However, the effect of the training does not last after 3 months detraining.

KEYWORDS :*yoga training, physical performance, Physical exercise, physical fitness.*

INTRODUCTION

Yoga is believed to exhibit a powerful and profound effect on the respiratory system, perhaps more than that on any other organ in the body. Studies have shown that yoga has a positive effect on the pulmonary function tests. Pranayama, the fourth limb of Ashtanga yoga, is an important component of yoga training. In yoga tradition, pranayama means “control over breathing”. Where breath is the life source of an individual. Pranayama can assume rather complex forms of breathing, but the essence of practice is slow and fast breathing.

Madanmohan et al., studied the effect of slow and fast pranayama on respiratory pressures and endurance, which is a good index of respiratory muscle strength. This study confirmed that slow and fast pranayama are effective in strengthening the respiratory muscles.

The effects of yoga training on pulmonary function have been previously studied. These studies have mainly investigated the effects of yoga training on vital capacity and peak expiratory flow rate (PEFR) in comparison with a sedentary control group. Ross in his review article compared the health benefits of yoga and exercise (walking, stationary cycling, dancing, and gentle aerobic exercises) and concluded that yoga is as effective or superior to exercise in a healthy and diseased population.

Researchers have observed that the significant change in the lung functions can be brought about even

with short-term yoga training. Only 3 weeks of yoga program conducted for 28 visually impaired 11-17-year-old children showed reduction in the breath rates significantly.

We planned to undertake the present study with the objectives to determine whether 3 months yoga training produces improvements in pulmonary function test and respiratory pressures in comparison with a active control group (performing physical exercises (PE) as per the school curriculum) in the pediatric group aged 7-9 years of low socioeconomic population, where there is limited randomized trial study of an effect of physical activity interventions. The participants of the study were comparable in their physical activity as they belonged to the same school and followed the same curriculum.

SELECTION OF VARIABLES

The investigator reviewed various scientific literatures pertaining to the effect of yoga practices on selected health related physical fitness and psycho-physiological variables from books, journals, periodicals, magazines and research papers. Taking into consideration of feasibility criteria, availability of instruments and the relevance of the variables of the present study, the following variables were selected and appropriate tools were used:

1. Dependent Variables and Tools Used

Before and after experiment following variables were assessed considering standard tests

Dependent Variables and Tools used

Sr. No	Test Name	Tools used	Measurement Units
AAHPERD **HEALTH RELATED PHYSICAL FITNESS**			
1.	Cardiovascular endurance	1 mile run	Min.:Sec.
2.	Abdominal muscle strength	Modified Sit ups	No./min.
3.	Flexibility	Cureton's Box	Cm.
4.	Body fat	Skin fold caliper	mm.
PHYSIOLOGICAL TEST			
1.	Pulse Rate	Sphygmomanometer	Beats/Min.
2.	Respiratory Rate	Observation of chest movement	Cycle/min
PSYCHOLOGICAL TEST			
1.	Personality Inventory with following factors	Questionnaire	Points
•	Confidence	Personality inventory	
•	Neurotic Tendency	Test by Dr.Usha	
•	Self Sufficiency	Khaire	
•	Sociability		
•	Mental Health		

The participants were found really encouraged to exhibit their best effort in each of the above tests.

2. Independent Variables

One independent variable had been included in this study i.e., Yoga.

a) Designing Yoga Training Schedule

Yoga training programme was designed on the basis of following principles:

Yoga which is an ancient science, helpful not only for the cure of diseases but is also helpful in making and keeping already fit and healthy individuals more fit and healthy. And it has been observed

• that breathing exercise (pranayama) and meditation lead to better concentration and improved performance.
•It is an established fact that Yoga training improves fitness and skill execution. In fact, the training causes enhancement in the endorphin level of the brain, required for neurological functions, leading to an increase in endurance and general vigour of an individual, thereby causing improvement in skill execution. Practice of asanas improves physical and motor fitness. Asanas involve exercising of various muscle groups at different joints and numerous combinations and also provide massage to vital organs of the body, which effects their functioning in positive manner. The slow stretching and holding methods in yogic postures increase the flexibility, a necessary quality to maintain performance and avoid injuries.
• The very principles of yoga as described in Patanjala yoga sutra (Karambelkar, 1989) were followed strictly by yoga experts. Thus, the subject steadily with comfort performed the yoga practices.
• Yoga exercise were performed by restrict the repetition to once only because there is no indication in either patanjala yoga sutra or in Hath yoga to repeat the asana several times. Thus emphasizing the mastery over the practice of yoga exercise, the subjects were instructed to maintain them for quick a long times with steadiness and comfort.

b)Training Method for Performing Yoga practices

Yoga practices for the experimental Group A were constituted on the basis of the principles of classical yoga (Kuvalayananda, 1933). Therefore, methods of performance were also taken care of on the basis of the followings:

• The researcher followed the principles of yogasana as described in Patanjala Yoga Sutra (Karambelkar, 1989). Thus, the subject performed the yoga practices steadily with comfort.
• Treatment or training period for the subject was twelve weeks duration daily in the morning for one hour.
• Asanas were taught as well as practiced in the hall of Jijamata Vidyamandir, Barshi, in the morning at 7.30 to 8.30 a.m., under the guidance of expert yoga teacher. The subjects were suitably dressed for the purpose.
• The control group was also engaged in some light jobs of no physical adaptation, while experimental group was practicing scheduled yoga practices as treatment stimulus. All other conditions were alike in terms of daily school routine.
• Subject, in general, were interested and adoptive to the programme. None of the subjects came to the notice of investigator having a long history of practicing the selected yoga practices. Attendance of the subjects in the experiment is found satisfactory.

c) Schedule of Yoga Training for 12 weeks

The yoga training schedule for total period of 12 weeks is presented as follows:

Schedule of Independent Variable (Yoga Practices)

Sr. No.	Yogasanas	1st Week to 4th weeks (Mins)	5th Week to 8th Weeks (Mins)	9th Week to 12th Weeks (Mins)
	Prayer	4	3	3
1.	**Asana (Sitting Position)**			
	Padmasana	2	2	3
	Vajrasana	2	2	2
	Paschimottanasana	2	1	2
2.	**Asana (Standing –Position)**			
	Tadasana	1	1	2
	Chakrasana	2	2	2
3	**Asana (Prone- Position)**			
	Dhanurasana	1	2	1
	Shalabhasana	1	1	1
	Bhujangasana	1	2	2
4.	**Asana (Supine Position)**			
	Naukasana	2	3	2
	Halasana	1	3	2
	Shavasana	7	5	5
5.	**Pranayama**			
	Anuloma Viloma Pranayama	5	7	8
	Bhramari Pranayama	5	5	5
6.	**Kriya**			
	Kapalbhati	5	5	4
	Trataka	10	8	8
7.	**Bandha**			
	Mulabandha	2	2	2
	Jiva Bandha	2	2	2
8.	**Mudra**			
	Sinhamudra	1	1	1
	Brahmamudra	4	3	3
		60 Mins.	60 Mins.	60 Mins.

DISCUSSION

The effect of aerobic training on the lung function is well known. Yoga, an ancient Indian exercise, has gained much accolades in the field of health and fitness. Since most studies are conducted on the adolescent and adult population, the effect of yoga in children is unknown. Our interest lies in the less explored age group of middle childhood and also to quantify the sustained effect of yoga.

Respiratory function depends on several factors, including chest expansion, lung dimensions, respiratory muscle strength, air way resistance and alveolar surface area. Pranayama, one of the limbs of Asthanga yoga, is known to have profound effect on the pulmonary function than any other part of the human system. Pranayama consists of different kinds of breathing patterns such as alternate nostril breathing, Mukha bhasthrika pranayama, and Bhrahmari pranayama. Pranayama is essentially a breathing exercise against resistance, and its positive effects on lung functions is well documented.

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