



Short Communication

## Effect of Yoga practices on muscular endurance and flexibility of young adult girls

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### Abstract

*Yoga science has several concepts, method and regulations which are very much essential to each and everyone. It should be clearly understood that yoga is a real sword to lead a healthy life. The purpose of the study was to find out the effect of yoga practices on muscular endurance and flexibility of young adult girls students of R D G College, Akola. For this study 30 students were selected among who 15 student's practices yoga on regular basis and the rest 15 did not perform any yoga. 15 students practices yoga on regular basis were the experimental group and the Non Yoga practitioners were the control group. The experimental group practices yoga regularly i.e. six days in a week for four weeks, under direct supervision of the researcher. The control group did not perform any yoga for the four weeks. The subjects were tested on the selected fitness variables before and after four weeks of practice. The data was statistically analyzed. The result of the study revealed that there was a significant improvement in muscular endurance and flexibility of experimental group than the control group. So it was concluded that the effect of yoga on muscular endurance and flexibility of young adult girls was positive.*

**Keywords:** Yoga, young, adult girls, muscular endurance, flexibility.

### Introduction

With the declaration of the International Day of Yoga, the United Nations has refocused a global attention on yoga. It was more than a century back that Swami Vivekananda, the father of the Indian renaissance, made the world aware of the great heritage of yoga that India has to offer to the world. He lucidly and with subtlety summarized the four principal types of yoga: Bhakti-Yoga, Gyana-Yoga, Karma-Yoga, and Raja-Yoga. His four treatises on these yogas would be the foundation of the principles and theories of yoga for anyone who is seriously interested in teaching, services, and research in yoga. In his much celebrated lecture on "the ideal of a Universal Religion," the Swami has elaborated on how yoga can provide different types of mind with appropriate methods for their spiritual and intellectual development. With a noble futuristic spirit, he has stated, "yoga means union. To the worker, it is union between men and the whole humanity (through selfless work); to the mystic, between his lower and higher self (through psychic growth); to the lover, union between himself and the God of love (through devotion and surrender); and to the philosopher, it is the union of all existence<sup>1</sup>.

As yoga was considered an esoteric subject, shrouded in the Eastern mysteries, scientists were reluctant to investigate the domain for a very long time. The first initiative was taken by scientists in India. Professor Bal Krishan Anand (1917-2007), a pioneer neurophysiologist, besides his path-breaking research on the feeding center in the hypothalamus, he also undertook

studies of physiological variables in a Yogi, in deep meditation<sup>2-4</sup>. These studies generated a global interest in the cardiovascular and brain effects of yoga. The first nations, outside India, to get interested in serious research on yoga and meditation were the United States of America and Japan. Later, interest in yoga for health was widespread and people from many walks of life turned to the physical yoga. Despite such an interest, the Japan Yoga Therapy Society was established as late as in 2003. In 1960s and 1970s, the movement of transcendental meditation (TM), by Mahesh Yogi, got many scientists interested in scientific studies on TM. Wallace in a paper published in science showed that TM was accompanied by a decreased metabolic rate, a reduction in heart rate, an increase in basal skin resistance, and alpha activities on electroencephalogram<sup>5</sup>. These findings generated more interest in scientific research in yoga and deep meditation. As a consequence, the beneficial effects of yoga in stress management, cardiovascular diseases, anxiety, depression, etc., were explored. Several centers and institutes focused exclusively on the healing aspects of yoga in diverse studies. Nagendra, Tellis, Nagarathna, Alex Hankey, and others have contributed significantly to the field at SVYASA<sup>6</sup>.

The review by Bernstein et al. have shown that the number of adults practicing yoga have increased from 6% to 20% in the last 6 years (2007-2014). Though weight management is expected to be easier in yoga practitioners (YP), it has been reported that a large percentage continue to be overweight or obese. This emphasizes the need of equal attention to be given

to diet and other forms of exercise. The diverse styles of yoga have been mentioned in the review. The effect on adaptation to stress needs more attention in yoga practitioners<sup>7</sup>.

The study from the Patanjali Research Foundation and Australian collaborators investigated oxygen consumption (OC) in YP and patients with metabolic syndrome (MS)<sup>8</sup>. The interventions used were mental arithmetic stress and defined Yogic practices. The patients with MS had significant blunted poststress recovery of OC as compared to the YP group. The experimental protocol was fairly sophisticated and statistically well-designed with proper control of the laboratory milieu.

The fact that the OC of MS patients had a delayed recovery suggests that Yogic practices reduced the metabolic burden of the stress. Whether types of stress, other than mental arithmetic, would also impose similar metabolic burden needs to be explored further. Though authors do stress about the observational nature of the study and consider that a randomized controlled trial would be better. It is more desirable that MS patients should be studied longitudinally over a period of 3-5 years not only to study the OC, but diverse markers of obesity and MS.

An attempt was made to assess the impact of an 8-week Yoga intervention on physical activity in persons with or at risk of Type 2 diabetes<sup>9</sup>. Iyengar yoga techniques were followed in the interventional group. The follow-up of the patients and controls was for a long duration (from 3 to 15 months). The authors conclude that yoga had slight or no effect on physical activity over the long follow-up. However, the fact that the practice of yoga dropped from 54% to 14% suggests that the conclusion is totally fair. Yoga should be included in an interventional program that is integrative of diet, exercise, and if needed essential drugs for the prediabetic group. Despite the statistical analysis, the study does not contribute much as there was no reinforcement of daily Yogic practice along with other measures for obesity and metabolic disturbances.

The benefits of regular walking in overweight, obesity, and diabetes are well-known when coupled with also dietary control and other healthy lifestyle measures. However, somehow there are fine academic hair-splitting exercises to compare the individual measures for their effects on anthropometric and metabolic variables. These approaches when presented as comparative and controlled trials often gain a misplaced adulation. Recently, a comparative study of yoga and walking

for overweight and obese adults was conducted in 68 participants for 15 days only<sup>10</sup>. Several variables were studied basally and after randomized intervention. The diet was constant between the groups.

It is amazing that the authors make the obvious conclusion, "both yoga and walking improved anthropometric variables and serum lipid profile in overweight and obese persons." It is interesting to note that the statistically significant changes have occurred within a fortnight! This fact opens up the need to explore short term integrative interventions in obesity/overweight trials.

The health benefits of enhancing physical fitness (i.e., cardio respiratory fitness (CRF), muscular fitness, and flexibility) have become well established during the past decades. Higher levels of CRF and muscular fitness are associated with significantly lower risk of developing metabolic syndrome<sup>11,12</sup> and all-cause and cardiovascular mortality<sup>13,14</sup>.

**Objective of the study:** i. To study the effect of yoga practice on muscular endurance of Young adult girls, ii. To study the effect of yoga practice on flexibility of young adult girls.

### Methodology

From a larger pool of 30 young adult girl's student of R D G College, Akola in the age group of 18 to 20 years was studied. For the present study the girls were randomly selected. Among them 15 girls performed yoga regularly i.e. six days in a week and the rest 15 did not perform any yoga. 15 students who practices yoga on regular basis were the experimental group and the Non Yoga practitioners were the control group. The experimental group practices yoga regularly i.e. for 45 minutes daily for six days in a week for four weeks, under direct supervision of the researcher. The control group did not perform any yoga for the four weeks. Both the groups were assessed on selected criterion variables namely muscular endurance and flexibility. Both the groups were tested before and after the period of four weeks of practice on the selected variables as per the standard procedures. i. Muscular endurance was measured by using Bent Knee Sit up test. ii. Flexibility was assessed by Sit and Rest test.

### Results and discussion

Results are mentioned in Table-1 and Table-2.

**Table-1:** Mean differences between the pre test and post test scores of experimental and control groups on flexibility.

Group	Test	No	Mean	SD	MD	't' value
C.G	Per test	15	28.7	1.25	1.5	0.67
	Post test	15	30.2	1.18		
E.G	Per test	15	29.3	3.79	7.1	3.65*
	Post test	15	36.4	1.19		

**Table-2:** Mean differences between the pre test and score of experimental and control group on flexibility.

Group	Test	No	Mean	SD	MD	't' value
C.G	Per test	15	14.3	1.25	1.2	0.58
	Post test	15	15.5	1.18		
E.G	Per test	15	14.8	1.24	3.6	3.25*
	Post test	15	18.4	3.46		

### Conclusion

The finding of the results concludes that there was significant improvement existing between experimental and control group on Muscular endurance, Flexibility. It is also concluded that regular yoga practice would be beneficial for the young adult college student. So regular yoga sessions should be included in the time table of their respective courses and it should be made mandatory.

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