

Effect of Suryanamaskar and Physical Exercise on Physical and Physiological Variables among Men College Students

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Abstract

The majority of practitioners of yoga are primarily interested in improving health and fitness. Yoga has been gaining immense popularity due to the short – term as well as long term benefits that it provides. The ultimate goals may range from reaching moksha to physical immortality. Aerobic exercises if done regularly, contribute to development of mental health. The purpose of the study was to the effect of suryanamaskar and physical exercise on physical and physiological variables among men college students. The study was conducted among forty five students (N = 45) of college level . Totally 15 subjects were selected for each group i.e., Experimental Group I , Experimental Group II and Control group. The collected data were statistically analyzed by using analysis of covariance was applied at 0.05 level of significance.. The finding of the study showed that suryanamaskar brought greater significant effect in muscular strength , systolic & diastolic blood pressure than the physical exercises group.

Key words: Physical Exercises, suryanamaskar, muscular strength Systolic & Diastolic Blood pressure.

Introduction

Yoga is a practical discipline incorporating a wide variety of practices whose goal is the development of a state of mental and physical health, well-being, inner harmony and ultimately “a union of the human individual with the universal and transcendent existence. Both short term and long-term practice of yoga techniques are associated with reductions of basal cortisol and catecholamine secretion, a decrease in sympathetic activity, with a corresponding increase in parasympathetic activity, reductions in metabolic rate and oxygen consumption and salutary effects on cognitive activity and cerebral neurophysiology. The three types of disorders most evaluated in yoga studies have been psychiatric conditions, cardiovascular disorders, and respiratory disorders. (Khalsa SB, 2004.). Yoga is an excellent tool of promotive health that can enrich modern medicine. The practice of Yoga leads to the efficient functioning of the body with homeostasis through improved functioning of the psycho-immuno-neuro-endocrine system. A balanced equilibrium between the sympathetic and parasympathetic wings of the autonomic nervous system leads to a dynamic state of health.

Surya Namaskara is a practice, which has been handed down from the sages of Vedic time Surya means ‘sun’ and namaskara means salutation. In ancient times the sun worshipped as a daily ritual because it is a powerful symbol of spiritual consequences. . It was initiated by enlightened sages who knew that the practices helped to maintain health and led to greater social creativity productivity.

Surya Namaskara is composed of the three elements of form, energy rhythm. twelve postures create the physical matrix around which the form of practices woven.

These postures generate prana, subtle energy, W activates the psychic body. Their performance in a steady, rhythmic sequence reflects the rhythms of the universe, such as the twenty-four hours of the day, twelve zodiac phases of the year, the biorhythms of our own body. Involvement in systematic and scientific programmes of conducting the physical training will bring out the desirable changes in physical, physiological variables, contributing to the development of strength, speed and endurance, besides marked changes in resting pulse rate, resting respiratory rate, blood pressure and other physiological variables.

Physical exercises are performed quickly and with a lot of heavy breathing Yogasanas are performed slowly with relaxation and concentration. The benefits of various Yoga techniques have been professed to improve body muscular strength, performance, stress reduction, attainment of inner peace and self-realization

Purpose of the Study

The purpose of the study was to find out the effect of suryanamaskar and physical exercise on physical and physiological variables among men college students.

Hypothesis

It was hypothesized that there would be significant differences due to suryanamaskar practices on selected physical variables in muscular strength.

It was hypothesized that there would be significant differences due to physical exercises on selected physiological variables in systolic & diastolic blood pressure.

Review of Related Literature

Hart, CEF and Tracy (2008) determined Yoga as steadiness training: effects on motor variability in young adults. *J Strength Cond Res* 22(5): 1659-1669, 2008-Exercise training programs can increase strength and improve sub maximal force control, but the effects of yoga as an alternative form of steadiness training are not well described. The purpose was to explore the effect of a popular type of yoga (Bikram) on strength, steadiness, and balance. Young adults performed yoga training (n = 10, 29 ± 6 years, 24 yoga sessions in 8 weeks) or served as controls (n = 11, 26 ± 7 years). Yoga sessions consisted of 1.5 hours of supervised, standardized postures. Measures before and after training included maximum voluntary contraction force of the elbow flexors and knee extensors, steadiness of isometric elbow flexors and knee extensors contractions, steadiness of concentric and eccentric knee extensors contractions, and timed balance. The standard deviation and coefficient of variation (CV, standard deviation /mean force) of isometric force and the standard deviation of acceleration during concentric and eccentric contractions were measured. After yoga training, MVC force increased 14% for knee extensors and was unchanged for the elbow flexors muscles. The CV of force was unchanged for elbow flexors but was reduced

in the knee extensors muscles similarly for yoga and control groups. The variability of concentric and eccentric contractions was unchanged. For the yoga group, improvement in knee extensors steadiness was correlated with pretraining steadiness. Subjects with the greatest knee extensors force fluctuations before training experienced the greatest reductions with training. Percent change in balance time for individual yoga subjects averaged seconds, $p < 0.05$), with no change in controls. For young adults, a short-term yoga program of this type can improve balance substantially, produce modest improvements in leg strength, and improve leg muscle control for less-steady subjects.

Bal and Kaur, (2009), to determine the effects of selected asanas in hatha yoga on agility and flexibility level. The subjects for the study were selected on the basis of random group design. Thirty (N=30) male students were selected as subject for the present study from D.A.V. Institute of Engineering and Technology, Jalandhar (Punjab), INDIA. All the subjects ranged between the chronological 25 years. The selected subjects were further divided into two groups. Experimental treatment was then assigned to group "A" while group "B" acts as control. "Hexagonal Obstacle Test" was used to measure Agility whereas "Sit and Reach Test" was used to measure Flexibility. The subjects were subjected to the six week yogasanas training programme that includes Swastikasana, Mayurasana, Matsyendrasana, Paschimottanasana and Gomukhasana. The difference in the mean of each group for selected variable was tested for the significance of difference by "t" test. The level of significance was set at 0.05. The results have shown the significant improvement in flexibility, the treatment of six week yogasanas training programme also shown significant improvement in case of agility.

Methods and Materials

The sample for the present study consists of 45 college students from Chennai city. The subjects were selected using random sampling method. Their age ranged from 18-21 years. They were divided into three groups namely Experimental group I, Experimental Group II and control group (n=15).. Experimental group I was under the practice of suryanamaskar for the period of 8 weeks in mornings and Experimental group II was under the practice of physical exercises. The training programme was administered for forty five minutes per session. The control group did not engage in any special activities. The load was fixed based on the pilot study. The pre test and post test were taken before and after the experimental training programme.

The training programme was carried out for five days per week during morning session only (6 am to 6.45 am) for 8 weeks. Muscular strength was measured by sit-ups test and blood pressure (systolic & diastolic) was measured by using sphygmomanometer.

Training Schedule

Experimental Group I - Suryanamaskar : (Bihar school of Yoga)

Count 1: Pranamasana (Prayer Pose)

Stand erect with the feet together, let the hands be by the side of the body. Join both the palms together like worshipping in Namaskara mudra, rest on the chest, sternum. Set forearm:; straight so that the hand position looks like a triangle.

It is like a prayer pose, so one can do prayer or homage to the Sun - god. The body is totally relaxed, mind is focused with awareness.

Breathing: Breathe out completely. **Spiritual:** Anahata Chakra is activated.

Count 2: Piraiasana (Crescent Pose)

Raise and stretch the arms above the head touching the Cars. Push the hip and stomach forward, allowing the upper trunk, chest and head with hands mow back ward.

Breathing: In the hale while moving back ward. **Spiritual:** Visudhi Chakra is activated.

Count: 3 Padha Hastasana (Hand to Foot Pose)

Bend forward, place the palms or fingers of the hand by the sides of the feet. Try to touch the knee with forehead. Keep the knees straight.

Breathing: Exhale while bending forward. **Spiritual:** Swathistana Chakra is activated

Count: 4 Ashwa Sanchalanasana

Place the palms nut beside the feet. Stretch the right leg back ward as far as possible, the toes 1d knees touching the ground. Fold the left knee, lower the hip, raise the chest up, head tilted backward, eyes gazing upward towards the sky. The total back is curved li an arch.

Breathing: Inhale when the chest and head are raised. **Spiritual:** Ajna Chakra is activated.

Count-5 Sethu Bandha Asana (Bridge Pose)

Raise the hip and right leg up. Take the Left leg back, joined together with the right leg. Bring the weight or the body towards the shoulder. Support the weight or the bud)' with the straight hands. Now the body, from head to toe is adjusted to straight line and looks like a bridge.

Breathing: Hold the breath support the weight of the body. **Spiritual:** Manipuraha Chakra is activated.

Count-6 Astanga Namaskara (Salute with 8 parts)

Lower the knees, chest, and chin to the floor. The hip, buttocks, and ~lbclol11en arc kept in raised position.

Breathing .' Exhale while lowering. **Spiritual:** Swathistana Chakra is activated

Count-7 Bhujangasana (Cobra Pose)

Lower the buttocks and hips to the floor. Stretch the toes out Raise the head and spine gradually, supported by back muscles 75% raise the shoulders along with chest supporting 25%, tilt the head backward gazing upward, the back is .now curved like <In arch. The arms must remain slightly bent at the elbows.

Breathing – Inhale while raising the torso. **Spiritual:** Anahatha Chakra is activated.

Count-8 Parvathasana (mountain pose)

Raise the hip and buttocks up, and lower the trunk down and the head pushed in between the arms, so that the body looks like a triangle.

Breathing: Exhale to assume the posture. **Spiritual:** Visudhi Chakra is activated

Count-9 Ashwa Sanchalanasana (Equestrian fose)

Bring the same right leg forward in between the hands, The left leg is lowered and stretched backward placing the knee on the floor. Push the pelvis forward, raise the trunk up, tilt the head backward gazing upward. Assume the position - 4. (One can change the other leg also.)

Breathing: Inhale while raising tire chest lip. **Spiritual:** Ajna chakra is activated.

Count -10 Padha Hastasana (Hand to foot pose)

Bring the left leg forward next to right fool. Assume the position- 3

Breathing: Exhale Completely . **Spiritual:** Swathistana Chakra is activated

Count-11 Pirai Asana (Crescent Pose)

Raise the torso up, hands raised above the head touching the cars. Push forward the hip and stomach, following the upper trunk, chest and head with hands move beck ward. Assume the position - 2.

Breathing : Inhale while a assuming the pose. **Spiritual :** Visudhi Chakra is activated.

Count-12 Pranaam Asana (Prayer Pose)

Come back to erect standing position bring the hands to namaskara mudra. Assume the position - 1.

Breathing: Exhale to assume tire position. **Spiritual:** Anahatha Chakra is activated

Then lower the hands, relax the legs and body. Take deep long breaths to settle the breath and heart beat to normal. Take sufficient break and repeat the 12 steps with left leg stretching back in position 4, bringing forward in position

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- 9. Two rounds make one complete set. After completing each set (2 x 12 Positions) one should energize all the inner visceral parts with ujjayee breath (5 times).

Practitioner can gradually increase the sets] to 12. To increase flexibility position to position move 5 times. The last set is done energizing in each, position with ujjayee breath Slimes. The practitioner can feel the expansion and contraction of each ujjayee energizing different inner parts and areas in each position.

After completing the practice, lie down, observe "Shanti Asana" for rest, and relaxation for a few minute.

Suryanamaskar Mantras

Each round of suryanamaskara is done, after the utterance of "OMKAR" with the appropriate "BIJA" mantra, along with the corresponding name of sun god in the following sequence.

1. Aum Hram Mitraya Namaha
2. Aum Hrim Ravaye Namaha
3. Aum Hrum Suryaya Namaha
4. Aum Hraim Bhanave Namaha
5. Aum Hroum Khagaya Namaha
6. Aum Hrahm Pusne Namaha
7. Aum Hram Hiranyagarbhaya Namaha
8. Aum Hrim Maricaye Namaha
9. Aum Hrum Adityaya Namaha
10. Aum Hraim Savitre Namaha
11. Aum Hroum Arkaya Namaha
12. Aum Hrah Bhaskaraya Namaha

Experimental Group II - Physical Exercises

1. Warming up

2. Physical exercises

Neck rotation, Arms forward and backward rotations, flexed arm forward and backward rotations, Trunk Twist, Squat Thrust, Sideward lunges, Opposite toe touches, Slide leg raising, Sit-ups, Push-ups, Burpees, Heels raise.

3. Warm Down.

Analysis of Data

The data collected prior to and after the experimental periods on muscular strength and blood pressure (systolic & diastolic) on Physical exercise group, Yoga practice group and control group were analyzed and presented in the following table-I.

Table-I
Analysis of Covariance and 'F' ratio for Muscular Strength and Blood Pressure (systolic and diastolic) for Physical Exercise Group, Suryanamaskar Group and Control Group

Variable name	Group name	Suryanamaskar Group	Physical exercise group	Control group	'F' Ratio
Muscular Strength	Pre-test Mean	26.20	26.22	26.23	0.451
	Post-test mean	28.11	27.87	26.23	48.12*
	Adj. Post-test mean	28.02	27.75	26.63	55.21*
Systolic Blood Pressure	Pre-test Mean	128.31	128.22	164.7	0.112
	Post-test mean	120.11	122.21	165.20	12.53*
	Adj. Post-test mean	120.18	122.75	165.401	73.94*
Diastolic Blood pressure	Pre-test Mean	83.07	83.17	127.53	0.22
	Post-test mean	80.13	81.70	128.12	4.22*
	Adj. Post-test mean	80.81	81.26	128.54	12.22*

Significance at .05 level of confidence. (The table value required for significance at .05 level of confidence with df 2 and 43 and 2 and 42 were 3.21 and 3.22 respectively).

Further to determine which of the paired means has a significant improvement, Scheffe'S test was applied as post-hoc test. The result of the follow-up test is presented in Table-II.

Table-II
Scheff S test for the Difference between the Adjusted Post-Test Mean of Muscular strength and Blood pressure (systolic and diastolic)

Adjusted Post-test Mean of Muscular Strength				
Yoga Practice Group	Physical Exercise Group	Control Group	Mean Difference	Confidence interval at .05 level
28.02		26.63	1.39*	0.899
28.02	27.75		0.27	0.899
	27.75	26.63	1.12*	0.899

Systolic Blood Pressure

120.18		128.54	8.36*	4.481
120.18	122.75		2.57	4.481
	122.75	128.54	5.79*	4.481

Diastolic Blood Pressure

80.81		83.37	2.56*	1.189
80.81	81.26		0.45	1.189
	81.26	83.37	2.11*	1.189

*Significance at 0.05 level of confidence.

Results

The training intensity for Suryanamaskar and physical exercise was shown in appendices. Before applying the experiment all the subjects of the Suryanamaskar, physical exercise and control groups were attended the pre-test, which was conducted a day prior to the commencement of the training and the data were collected on muscular strength and blood pressure (systolic and diastolic). After eight weeks of training the post-test was conducted one day after the training period to find out any changes in the criterion variables.

The analysis of covariance (ANCOVA) was used to find out the significant difference if any, among the experimental groups and control group on selected criterion variables separately. In all the cases, .05 level of confidence was fixed to test the significance, which was considered as an appropriate. Since there was three groups were involved in this study, the Scheff S test was used as post-hoc test and it was shown in table – II.

After applying the analysis of covariance, the result of this study showed that there was a significance difference among Suryanamaskar, Physical exercise and control groups on the changes in muscular strength and blood pressure after eight weeks of training. The criterion variables such as, muscular strength was improved for the Suryanamaskar group and physical exercise group and systolic & diastolic blood pressure has significantly decreased after the Suryanamaskar, physical exercise period. Further, comparing the adjusted post-test means of all the criterion variables, such as, muscular strength and systolic and diastolic blood pressure, both the training groups were significantly increased performance after the training period, when compared with the control group. Basically the Suryanamaskar and Physical exercise has tremendously improves the physical, physiological parameters.

Discussion on Findings

The result indicated that the Suryanamaskar Group and Physical Exercises Group had significantly improved in Muscular Strength, Systolic & Diastolic Blood Pressure in terms of mean gain when compared with Control Group among college students.

In particular, the Suryanamaskar Group had significant improvement in Muscular Strength, Systolic & Diastolic Blood Pressure than Physical Exercise Group.

Finally, the findings of the present study proved that the Suryanamaskar Group has definite effect on the improvement of Muscular Strength, Systolic & Diastolic Blood Pressure than Physical Exercise Group.

The findings of this study is in agreement to the findings of Madanmohan et al.(1993), who found 12 weeks of practicing yoga programmes has significantly improved muscular strength and other physical variables.

Conclusion

The result indicated that the Suryanamaskar Group and Physical exercise Group had significantly improved in muscular strength, systolic & diastolic blood pressure in terms of mean gain when compared with Control Group among men college students.

Finally, the findings of the present study proved that the suryanamaskar Group has definite effect on the improvement of muscular strength, systolic & diastolic blood pressure in terms of mean gain when compared with Physical exercise Group.

The findings of this study is in agreement to the findings of Barshankar, et.al. (2003) , who found ten weeks of practicing yoga programmes has significantly improved blood pressure and other physiological variables.

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