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Effect of Surya-Namaskar on the Fitness Components and its Trends

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ABSTRACT:

Yoga plays a vital role as the ancient Indian healing art while dealing with the physical, mental, emotional, moral, and spiritual well-being. Yoga education is a process that helps in the all-around development of a human being. *Suryanamaskar* is a major part of yogic training that concentrates on physical health, mental health as well as spiritual health also. It is a sequential combination of 12 Yogic postures made up of a variety of spinal column forward and backward bending performed dynamically in synchrony with the breath. The objective of the study was to determine the effect of *Suryanamaskar* yogic training on the Components of Physical fitness i.e Strength, Speed, Endurance, Flexibility, and Coordination. The subjects for this study were selected from Punjab Engineering College (Deemed to be University), Chandigarh. A total of fifteen students were randomly selected for the study. *Suryanamaskar* was considered the independent variable and components of physical fitness were considered the dependent variable. Strength was measured by the handgrip dynamometer test in Kg. Speed was measured by the flying 30 meters test in time seconds. Endurance was measured by the sit-up test in 30 seconds. Flexibility was measured by the sit and reach test in cm. Coordination was measured by an alternate hand wall toss test. Repeated measure design was used for this study. The test was started four weeks prior to the treatment and thereafter every two weeks. Observations were taken up to the end of six weeks of training. To determine the effect of *Suryanamaskar* on fitness components, level of significance was set at 0.05 levels. In relation to fitness components, a significant ($p < 0.05$) effect of *Suryanamaskar* was found at the end of six weeks of training.

Key words – *Suryanamaskar*, Fitness components**.**

INTRODUCTION

Suryanamaskar is an ancient Indian method of offering prayers to the rising Sun in the morning along with a series of physical postures with regulated breathing aiming at range of physical, mental and spiritual benefits (Parag and Manjunath, 2012) [1]. It is a graceful combined sequence of twelve postures along with regulated breathing and relaxation. It relieves stiffness, revitalizes the body, refreshes the mind and purifies subtle energy channels. There are number of study have been conducted on

Suryanamaskar and found significant improvement in flexibility (Choudhary and Krzytof, 2010) [2].

Physical fitness, generally, is a state of health and well-being. Moreover, Physical Fitness has been measured through its five basic components i.e. Strength, Speed, Endurance, Flexibility, and Coordination. Although, there is no single way to measure a physically fit person and no single way to get achieve it. Therefore we need to know and understand every dimension of the components of physical fitness. The foremost component of physical fitness is strength. Strength is a maximal force that can be applied against a resistance. The second component, Speed is the ability to move from one place to another in the shortest possible time. Endurance is a capability of a person's ability to repeatedly apply maximal force over a period of time. Flexibility can be defined as the ability to execute movements with a greeter amplitude of range. One of the most important benefits of a flexibility program is the potential for relaxation. Physiologically, relaxation is the cessation of muscular tension. Undesirably high level of muscular tension has several negative side effects, such as decreasing sensory awareness and raising blood pressure. It also wastes energy, contracting muscles requires more energy than relaxed muscles. Furthermore, habitually tense muscles tend to cut off their own circulation. Reduced blood supply is results in a lack of oxygen and essential nutrients that causes toxic waste products to accumulate in the cells. This process predisposes one to fatigue, aches, and even pain. (Michael, 2004). [3]

The practice of *Yogasanas* is the best way to improve the fitness components especially flexibility. There plenty of studies that have been done to see the effect of *Yogic asanas* on flexibility and *Suryanamaskar* are itself a combination of seven *asanas*. (Shankar & Pancholi, 2011). [4] Going through many research papers this query has been raised to find in which trend (pattern) fitness components improve and how much time is needed for significant improvement in all components of physical fitness. The objective of the study was to determine the effect of *Suryanamaskar* on fitness components and its trend.

Methods Table 1

Subjects: The subjects for this study were selected from the Punjab Engineering college (Deemed to be University), Chandigarh. Fifteen students in the age group of 18 – 23 years were selected randomly for this study.

Variables: *Suryanamaskar* was considered as an independent variable and Fitness components were considered as the dependent variables.

Testing of physical fitness components: Table 2, Table 3

Test for Strength: The strength of the body was measured by Handgrip Dynamometer or Grip strength test. The subjects were asked to remove their shoes and sit properly and be relaxed. Then the subjects were asked to use their dominant hand and apply hand grip pressure as much possible on the dynamometer. (It's an instrument that helps to examine the grip strength in Kilograms.) The examiner recorded the maximum reading. The score was expressed in the number of Kilograms. Three trials were given and the highest score was recorded.

Test for Speed: The speed of the subject was measured by flying 30 meters test. First of all the subjects were asked to be relaxed and calm down. Then the subjects conducted a warm-up for 10 minutes. The examiner assumed the mark of 60 meters straight from point A to point C with cones and also placed a cone at 30 meters point B. The subjects started with the command of "Go" and the examiner noted down the reading of the subjects from point A to B and also Point B to C. The record of the score and time was taken twice and the best score was recorded.

Test for Endurance: The endurance of the subject was measured by a sit-up test. The subjects were asked to conduct a warm-up for 10 minutes. Then the subjects lied down on the mats with bent knees and feet flat on the ground, and placed their hand near their ears. The assistant held the ankle joint and feet. The examiner gave a command "Start" and started the stopwatch. The subjects sat up and touched the knees with their elbow, then returned back on the ground and continued to perform as many as possible in 30 seconds. The examiner counted and recorded the number of correct sit-ups completed in 30 seconds. Then, the Final recorded score was to assess the final performance of subjects.

Test for flexibility: Flexibility of lower back and leg muscles was measured by Sit and Reach test. The subjects were asked to remove the shoes and place their feet against the testing box while sitting on the floor with straight knees. Then the subjects were asked to place one hand on top of the other hand so that the middle fingers of both hands were together at the same length. The subjects were asked to lean forward and place their hands without bouncing over the measuring scale on the top of the box for at least one second. Bending of the knees was not allowed. The score was expressed in a number of centimeters. Three trials were given and the highest score was recorded.

Test for Coordination: Fitness component- Coordination of the subjects was measured by an Alternate hand wall

toss test (to measure the hand-eye coordination). The subjects were asked and shown the mark point which was 2 meters far from the wall. The subjects stood behind the marked point and faced the wall. Then the subject threw the ball from one hand in an underarm action against the wall and attempted to catch with the opposite hand. Again the ball was thrown back against the wall and caught with the initial hand. This test continued for 30 seconds. The score was expressed in the number of throws in a set period of time.

Experimental design:

The repeated measures design was used for this study. Only one group of 15 boys was created. Total treatment duration was six weeks. Tests were administered in equal interval of two weeks. The tests were started four weeks prior to the *Suryanamaskar* treatment and took place every two weeks, for three times. Thereafter, tests took place every two weeks during the treatment.

All participants were briefed about the general objectives and requirements of *Suryanamaskar*. *Suryanamaskar* training was carried for a period of six weeks, five days per week. The scheduled time of practice lasted for 30-40 minutes. Each day of the first week, *Suryanamaskar* practice was demonstrated to the group by the expert and the most important points were reviewed several times. Afterwards, a review of the most important and common mistakes was conducted once per week. The pace of *Suryanamaskar* was 2 minutes for each round. Each step took around 10 seconds. To determine the effect of *Suryanamaskar* on fitness components and its trend

RESULT

The mean values and standard deviation of different trials are shown in table 1

*The mean difference is significant at the 0.05 level.

Table 2 shows that there is no difference between trial 1 and trial 2, trial 1 and trial 3, trial 2 and trial 3. This shows that no improvement took place in fitness components before the start of the treatment or practice of *Suryanamaskar*. There is no significant difference between trial 3 and trial 4. This indicated that the short duration (two weeks) of practice does not significantly improve the performance of all five components. There is a significant difference between trial 3 and trial 5, trial 3 and trial 6, trial 4 and trial 5, trial 5 and trial 6. This indicated that the 4 weeks of practice of *Suryanamaskar* is sufficient to bring a significant improvement in fitness components.

DISCUSSION

The purpose of the study was to determine the effect of *Suryanamaskar* on fitness components and its trend on PEC (Deemed to be university) students. The findings of this study revealed that there was a significant improvement in components of physical fitness due to the regular practice of *Suryanamaskar*. From *asana's* point of view, muscle length can be modified and stretching is the primary method by which muscle lengthening can occur. A muscle has both an origin and an insertion point, basically the two ends of a muscle. At each end of the muscle, a tendon attaches that muscle to the bone. Stretching involves taking these two ends of the muscle further apart to lengthen the muscle and tendons and maintain this length of the muscle in the long term. Muscle has a visco-elastic property. Basically, this means that it is not perfectly elastic, like a rubber band. When a rubber band is stretched it returns to its normal length. Over time, however, when muscles are stretched they experience creep, that is, they gradually get longer, thus increasing the performance of all components of physical fitness.

In the study, the pair-wise comparison shows that the duration of six weeks of treatments was sufficient to bring out the significant difference (improvement) in fitness components and also shows that the short duration of only two weeks of the treatment was not effective enough to bring about any significant difference, while a significant difference was noted after at least four weeks of treatment. In this way, the present study confirmed that the practice of Suryanamaskar has a significant effect on all five components of physical fitness.

CONCLUSION

The *Suryanamaskar* is type of Dynamic Yogic practices series which is a unique form of Yoga as it integrates physical and mental body. This study is to assess the effects of *Suryanamaskar* and showed significantly increasing in Physical Fitness components i.e. Strength, speed, Endurance, flexibility and Coordination after a Six weeks intervention. Athletes may greatly benefit from six weeks duration of Suryanamaskar as it may be helpful in relieving muscle stiffness in the Axial Skelton alignment and Appendicular skelton alignment. The additional benefit of improved the level of concentration and confidence which is very important especially for a athlete to increase their performance during competition.

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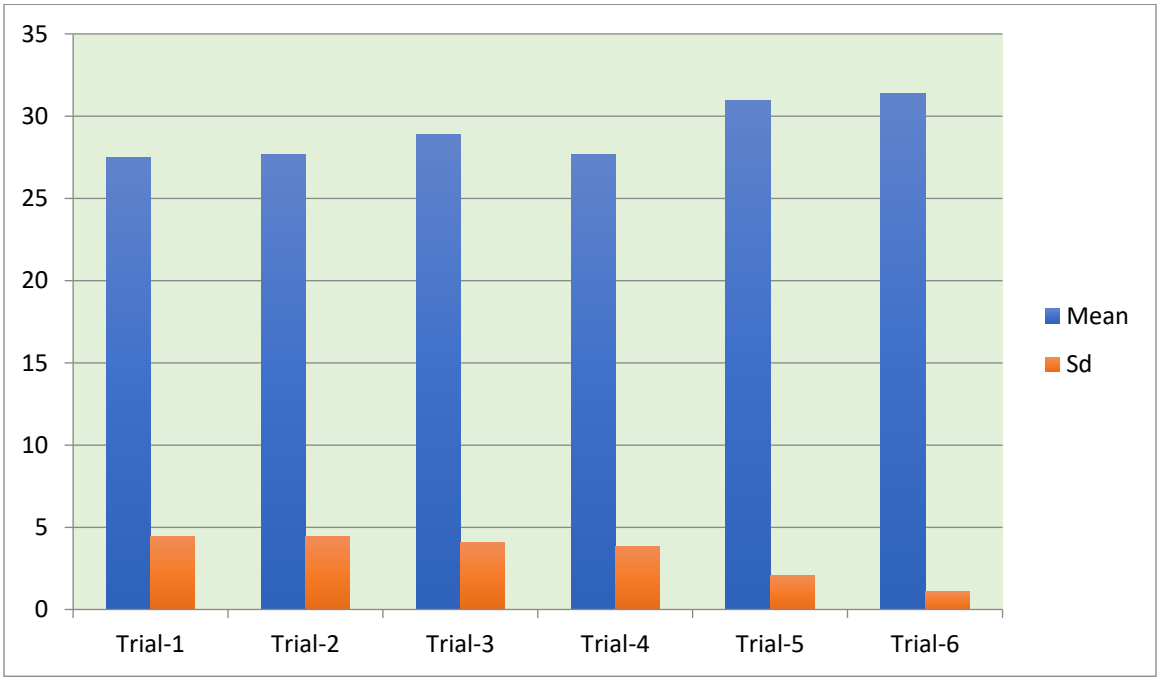
Table 1

Trials	1	2	3	4	5	6
	Pr-treatment	Pr-treatment	Treatment	Treatment	Treatment	Treatment
Time(weeks)	-4	-2	0	+2	+4	+6

Table 2 Descriptive statistics of six different trials of aggregate fitness components

	Mean	Std. Deviation	N
Trial-1	27.4615	4.45673	13
Trial-2	27.6923	4.41654	13
Trial-3	28.8846	4.09532	13
Trial-4	27.6538	3.85476	13
Trial-5	30.9615	2.06745	13
Trial-6	31.3692	1.07643	13



Now pair-wise comparison between trials is show in table 2

Table 3 Pair-wise comparison of all six trials of aggregate fitness components

Trails	Mean difference	Sig.
Trial1	- .231	1.000
Trail2	-.423	1.000
Trial3	-1.192	1.000
Trail4	-5.500*	0.002
Trial5	-7.908*	0.000
Trial6		
Trial2	-.192	1.000
Trail3	-.962	1.000
Trial4	-5.269*	0.003
Trial5	-7.677*	0.000
Trial6		
Trial3	-.769	1.000
Trial4	-5.077*	0.007
Trial5	-7.485*	0.000
Trial6		
Trial4	-4.308*	0.000
Trial5	-6.715*	0.000
Trial6		
Trial5	-2.408*	0.000
Trial6		