



Impact of Surya-Namaskar on explosive strength of upper-Body of Girls

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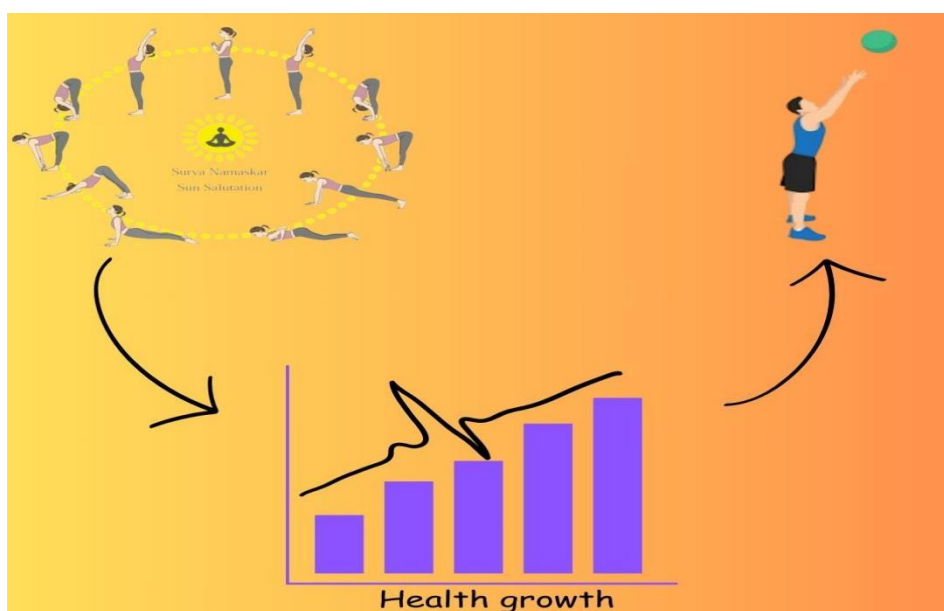
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Abstract : The goal of this study was to determine how the yoga exercise Surya-Namaskar affected on upper body explosive strength. Samples of people were divided into two groups. In this study randomized the experimental group, which practiced Surya-Namaskar. Upper body explosive strength was assessed before and after the intervention using a medicine ball throw test on subjects. The results of the investigation demonstrated a considerable gain in upper body explosive strength. In the experimental group who routinely practiced Surya-Namaskar during the intervention period. This suggests that Surya-Namaskar has a positive impact on the development of explosive upper body strength. Academics, athletes, fitness enthusiasts, and those who desire to increase their upper-body explosive strength can all benefit from the study's findings. Surya-Namaskar could be a useful replacement for traditional strength training exercises in exercise routines. It also illustrates how yoga practices could improve physical performance and presents novel viewpoints on the disciplines of exercise science and training methods. Future research may examine the mechanisms responsible for the reported improvements in explosive power following Surya-Namaskar training. This study adds to our understanding of the relationship between Surya-Namaskar and upper-body explosive strength. It opens up new research possibilities in the field of yoga-based training and its potential benefits for boosting physical fitness, especially in terms of building explosive strength.

Index Terms - Yoga, Surya-namaskar, asana, strength, explosive strength.

Graphical abstract



I. INTRODUCTION

The word 'Yoga' is derived from the Sanskrit root 'Yuj', meaning 'to join' or 'to yoke' or 'to unite'. Yoga is a form of mind-body fitness that involves a combination of muscular activity and an internally directed focus on awareness of the self, the breath, and

energy [1]. Yoga can be divided into four main branches which are: Bhakti yoga, Karma yoga, Gyana yoga, and Ashtanga yoga these variations fundamentally offer a means by which individuals are able to enhance their control and development of body and mind. Benefits of yoga include increasing lubrication of the tendons, joints and ligaments. It is important to include flexibility training as part of our regular fitness routines. It is a form of active relaxation that can improve both mental and physical recovery [1]. Asanas are special patterns of postures that stabilize the mind and the body through static stretching. Asanas also relax muscular tensions, something that is essential for people today who find this most difficult. In many cases people consider themselves to be relaxed, yet the muscles remain in a state of tension. Asanas remove these tensions and give the practitioner a real muscular relaxation [2]. Surya-Namaskar (SN) or Sun salutation is a part of yoga [3]. It is a series of physical postures (asanas) with regulated breathing aiming at range of physical, mental and spiritual benefits [4]. ‘Surya Namaskar’ or ‘Sun Salutation’ is an integral part of the yogic approach to these problems and can be easily integrated into our daily lives as it requires only five to fifteen minutes of daily practice to obtain beneficial results. Surya Namaskar is a series of twelve physical postures or asanas [5]. It includes 12 physical postures with forward and backward bends. The series of movements stretch the spinal column and upper and lower body through their full range of motion, by alternately flexing the body forwards and backwards. It builds upper body strength through the inherent weight bearing positions, especially in the arms and shoulders. The series gives such a profound stretch to the body that it is considered to be a complete yoga practice by itself [6]. The ability to work against resistance is a sign of muscular fitness. The maximum force that a particular muscle or muscle group is capable of producing is known as muscular strength. There is no one test for determining muscle strength as well as explosive muscle strength because the maximal force that may be produced relies on a number of variables, including the size and number of muscles engaged, the percentage of muscle fibers activated, the coordination of the muscle groups, etc.

“EXPLOSIVE” MUSCLE STRENGTH can be defined as the rate of rise in contractile force at the onset of contraction [7]. There have been 6 reviews that reported the effect of upper-limb strength training on upper-limb strength, function, and ADLs. Four of these studies were systematic reviews wherein a search strategy and method of study evaluation were transparent, whereas the remaining 2 provided a synthesis of the literature on strength training in stroke. Of the 6 reviews, 4 reported evidence that upper-limb strength training improved strength and upper-limb function. Two studies found no effect of upper-limb strength training; these reviews included only a few studies of upper-limb strengthening. No review found a significant treatment effect for ADLs.

However, there are issues with the previous reviews. Morris et al calculated the effect size of 2 upper-limb trials and reported a positive effect of strength training on upper-limb muscle strength and function; however, this was in contrast to Van Peppen et al, who reported on the same 2 trials and concluded that there was no evidence for improved strength and dexterity. Ada et al calculated a pooled-effect size from strength trials and found a small but positive effect on strength and functional measures. However, interpretation of their findings is uncertain because pooled estimates combined trials focused on upper- and/or lower-limb function (eg, gait speed, hand use), as well as different modalities (eg, resistance training, robotics, electric stimulation). The study objective was to examine the evidence for strength training of the paretic upper limb in improving strength, upper-limb function, and ADLs [8-15].

II. OBJECTIVES OF THE STUDY

1. To find out the significant difference between pre and post-test of explosive strength of upper body.
2. To find out the important role of Surya Namaskar in the field of physical education.

HYPOTHESIS

1. It was hypothesized there may be a significant difference on explosive strength of upper body due to Surya Namaskar practice among physical education students.

III. METHODOLOGY

SELECTION OF SUBJECT

To achieve the purpose of the present study total 22 physical education students were randomly selected using random sampling from DAV University, Jalandhar, aged ranged between 17 to 25.

SELECTION OF VARIABLE

Independent variables

- Surya Namaskar

Dependent variables

- Upper body explosive strength

CRITERION MEASURES

Upper body Explosive strength was measured by medicine ball throw and recorded in the meters. The starting position to where the ball land was recorded as a distance. The distance measured was recorded to the nearest 0.5 foot or 10 cm. The best result of three throws is used.

EXPERIMENTAL DESIGN

The study was to find out the effect of Surya-Namaskar practices on selected physical fitness variables among physical teaching students single group design was used. The total subjects were 22 aged between 17 to 25 years. Data were collected from each subject pre-test and post-test of the 4 weeks of training session, where five days a week and each day 30 minutes of Surya -Namaskar practiced by the subject following by common stretching exercise . The test items were designed according to purpose of the study.

STATISTICAL PROCEDURE

The data were analyzed by applying descriptive statistical and paired t-test by the use of SPSS V 23.0. The level of significance was set for the study at 0.05.

IV. RESULT AND FINDINGS

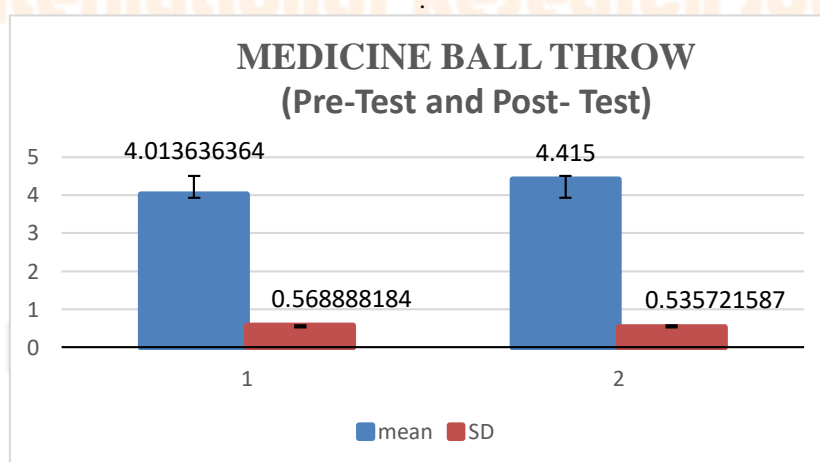
Table-1 Descriptive Statistics and independent Sample t-test of medicine ball throw of DAV University Level student's pre- test and post-test.

GROUP	PRE TEST	POST TEST
MEAN	4.104545455	4.324090909
SD	0.563574707	0.593421548
T-TEST	0.000017209	
N	22	

**Significant at 0.05 level of significance* *t = 0.000*

Table: 1 depicts two distinct tests, pre-test and post-test, in terms of their respective means, standard deviations, and P-values. The mean is a measure of the average value of the data within each group. For the pre-test, the mean is 4.104545455, while for the post-test, it is 4.324090909. The standard deviation, which gauges the spread or variability of data points within each test group, is 0.563574707 for the pre-test and 0.593421548 for the post test. Hence, data shows that there is a significant difference level of anxiety between humanities and sciences students of DAV University.

Graph-1 show the mean and SD of medicine ball throw of DAV University Level physical education students pre-test and post-test



Medicine ball throw is one of the best ways to measure upper body strength. According to this **Graph-1** it was observed that mean score were noted as 4.013636364 and SD were noted as 0.568888184. Similarly in post-test observation mean score were calculated as 4.415 and SD score were calculated as 0.535721587 Which shows that there is a significant difference in pre-test and the post test of medicine ball throw after 4 weeks (5 days per week) practicing of Surya Namaskar.

DISCUSSION ON HYPOTHESES

As per the result of used test and data interpretation the Hypotheses was accepted.

CONCLUSION & DISCUSSION

The purpose of this study was to determine the effect of Surya-Namaskar on upper body of physical education students of DAV University. According to the analysis result shows that there is a significant improvement in upper body strength by calculating the level of strength with the help of medicine ball throw test. Surya Namaskar poses helps in strengthening the upper part of the body muscles. The present study focused on upper body strengthening while performing the 12 yoga poses of Surya-Namaskar [12]. In the present study it was found that Surya Namaskar shows positive effect to improving strength of upper body. Thus, Surya Namaskar can be recommended to improve one of the strength components of physical fitness.

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