



## THE EFFECT OF YOGA AND PHYSICAL EXERCISE ON LEG EXPLOSIVE STRENGTH AND AGILITY VARIABLES OF SECONDARY SCHOOL STUDENTS

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### Abstract:

The purpose of the study was intended to assess the effect of yogic and physical exercises on leg explosive strength and agility, for this purpose hundred fifty students studying in various classes of Government high school Nagathan of Vijayapur in Karnataka state in age group of 14-16 years were selected. They were divided into three equal groups, each group consist of fifty subjects, in which group-I underwent yoga practices, group-II underwent physical exercises and group -III acted as control group who were not allowed to participated and receive any special treatment apart from their regular curriculum classes', the training period for this study was six days a week for twelve weeks, the before and after the training period, the subjects were tested for leg explosive strength and agility ability. The analysis of covariance (ANCOVA) was applied to find out which group has better in performance, whenever "F" ratio for adjusted test was found to be significant for adjusted post-test means Scheffe's test was followed, as a post hoc to determine which of the paired means differ significantly. It was drawn conclusions that after the training of yoga and physical exercise both training has improved leg explosive strength and agility, significant increases found in explosive strength among the physical exercise group comparing their counterpart and agility has ability has been increased in the physical exercises comparing to yoga group.

**Keywords:** secondary school students, yoga, physical exercise, explosive strength, agility variables

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## 1. Introduction

Yoga is the art and science of maintaining physical and mental wellbeing that has its origin in India, is among the most ancient yet vibrant living traditions that is getting increasingly popular today. A potent stress buster, yoga is an instrument of self-evolvement and enlighten, through physical and mental well-being. Math-dimension it enhances the quality of our lives at so many levels. One aspect of yoga's benefits is to explore the bond between health and beauty.

The word Yoga derived from Sanskrit word "YUJ" meaning to yoke, join or unite. This implies joining or integrating all aspects of the individual body with mind with soul- to achieve a happy, balanced and useful life, and spiritually, uniting the individual with the supreme,

Physical exercise in any organised activity that involves continuous participation and effects on whole body. Exercise occupies a leading role in keeping a person fit. It will be quite difficult to adjunct one's life in terms on stress, diet, and sleep and so on without proper exercise.

Regular practices of asana maintain the physical body in an optimum condition and promote health even in an unhealthy body. Through asana practice, the dormant energy potential is released and experienced as increased confidence in all areas of life, yogasna have a deeper significance value in the development of the physical, mental, and spiritual personality, whereas pure exercise only have physical effect on muscles and bones.

Physical exercises are performed quickly and with a lot of heavy breathing, yogasan 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.

Schools are dynamic setting for promoting health and wellness through various correlated areas such as physical education and sports. There is a growing awareness that the health and psycho-social wellbeing of young children is of paramount importance and schools can provide a strategic means of children's health, self-esteem, life skills and behaviour.

The yoga and physical exercise are the means to notice all round and harmonious development among school students in the modern society, hence scholar made an attempt explore the "**The Effect of Yoga and Physical Exercise on Selected Physical Variables of Secondary School Students**". The present study was carried out in the background of the experimental method.

## 1.1 Hypothesis

There would be significant effect of yoga and physical exercises training on improvement of motor variables of secondary school students.

1. The training of physical exercises leads to better in leg explosive power and agility comparing to yoga training
2. There is no significant difference of yoga and physical exercise training in improving motor and physical fitness abilities among students

## 1.2 Objectives

To assess the effect of yoga and Physical exercises on motor and physical fitness variables of secondary school students.

## 2. Methodology

The purpose of the study was to find out effect of yogasana on selected physical variables such as flexibility and explosive power between yoga and Physical exercises group, to achieve the purpose of the study 200 students studying in the Government High School Nagthan and Sanganbasaveshawar residential school of Vijayapur district of Karnataka (India) has selected randomly as subject for the experiment, they were divided into two equal groups, each group consists of the 100 students. Group I and Group II underwent yogasana and physical; exercises training for six days per week for twelve weeks. Group III Acted as control that did not undergo any special training programme apart from their regular physical education classes programme. The following variables' namely explosive power and agility were selected as criterion variables. All the subjects of two groups were tested on selected dependent variables at prior to and immediately after the training programme. The analyses of covariance were used to analyse the significant difference, if any among the groups. The 0.05 level of confidence was fixed as the level of significance to test the 'F' ratio obtained by the analysis of covariance, which was considered as an appropriate.

### 2.1 Analysis of the data

The data collected prior and the after the experimental period on leg explosive strength and agility of yoga and physical exercise group were analysed and presented in the following Table I.

## 2.2 Leg Explosive Power

The ability to exert a force against resistance is basically called strength and it is meant as power. In this research work it was hypothesized that there would be a significant difference in the Leg Explosive Power between the subjects of experiment 1 and experiment 2 and control group of experiment, it was assumed on the rationale that the regular and continuous involvement in strenuous, high intensive and strength productive activities and fast moment nature activities are going to increase the muscles, lungs and heart working capacity of the practitioners, this would help to enhance the muscle working capacity and reflexive action in the muscle system of the Physical exercises group. The leg explosive power needed for a sprinter to explode from the blocks is different from the strength needed by a weight lifter to lift weights. Hence Physical exercises group possess a higher level of leg explosive power comparing to control and yoga exercise group of secondary school students. The data on Leg Explosive Power before and after training of the yogic and Physical exercises and control groups are analysed and presented in the following table:

**Table 1:** Computation of Covariance of Leg Explosive Power of control Group, Experimental group 1 (Yogic Exercises) and Experimental group 2 (Physical Exercises) of Secondary school students

Source Variance	Df	Sum of the Square	Mean square	Remarks
Between the group	2	10263.730	5131.865	88.477
Within the group	296	17168.680	58.002	Sig.

Significant at 0.05 level

**Table 1A:** Leg Explosive Power means differences of control group (A), Experimental group 1(B), (Yogic Exercise) and experimental group 2(C) (Physical Exercise)

Group	M1	M2	Diff
Group C & E1	168.409	175.151	-6.742
Group C & E2	168.409	183.490	-15.081
Group E1 & E2	175.151	183.490	-8.339

### 2.2.1 Results and Findings on “Leg Explosive Power”

Table 1 shows the ‘F’ ratio of 88.477 which was greater than table value of 0.05 level. Hence Scheff’s Post Hoc test was employed to the data the score is 28.72 which was also found significant. Table-XIIA (shows Scheff’s Post Hoc test) shows the mean difference between the three groups. The difference between Group A (control group) and Group B (Yogic exercise) was -6.742. The difference between the Group A (control group) and

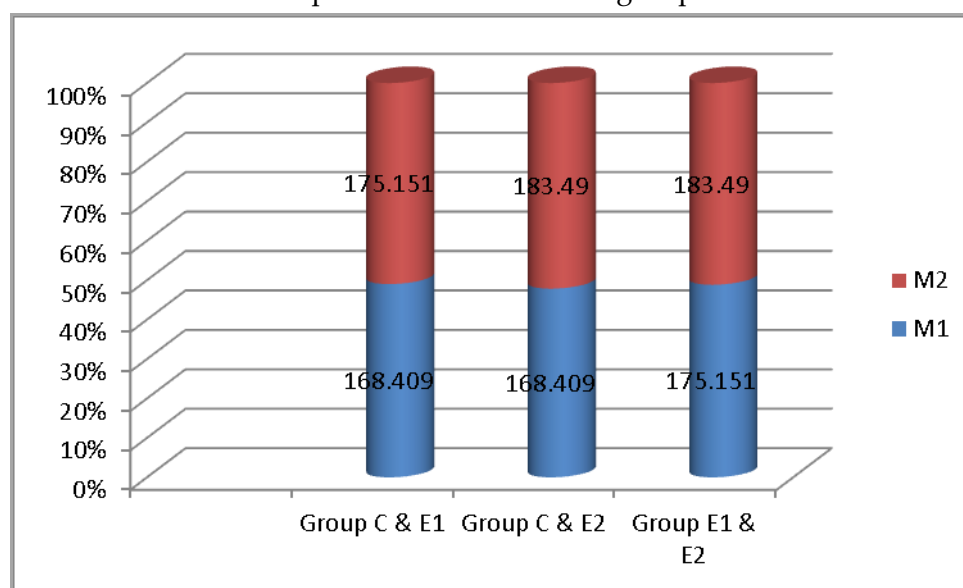
Group C Experimental group (Physical Exercise) was -15.081. The difference between Group B Experimental groups I (Yogic Exercise) and Experimental group II (Physical exercise) was -8.339. It is greater than table value that is 0.05 level.

### 2.2.2 Discussion on “Leg Explosive Power”

The greatest force that is possible in a single movement and it's of resistance with fast contraction. And it is ability to express force many times over for leg explosive strength. Hence the research work had shown the obsolete ability of power. When we refer Table 1A it reveals that computed F ratio was greater than the table value and data was employed to find-out the adjusted paired means that was also significant. From the statistical analysis of the data, it was found that Physical exercise has improved Leg explosive power than their counter part Yogic exercise and control group (Moorthy 1980, 1982). It may be due to the reason that Physical exercise is going to develop fitness qualities and motor factors among the regular practitioners, and they have performed more jumps than yoga group, it was assumed that varied activities, sudden changes and strenuous nature of Physical exercises has positive effect on developing muscle strength and explosive power among the trainers, Specially Standing poses are helpful for legs. They stretch and lengthen the muscles.

It is inferred that the leg explosive power in experiment group 2 is enhanced through physical training comparing with yoga training, therefore. It is statistically proved that the yoga training has helped in enhancing the leg explosive power, hence formulated hypothesis is statistically proved and stated hypothesis is accepted.

**Figure 1:** The Graph showing the mean difference of Explosive leg power between the experimental and control groups



### 2.3 Agility

The ability means to perform a series of explosive power movements in rapid succession in opposing directions like zig-zag movements. So this is the important part of this research work to explore and show the development of the agility ability of the students. It was hypothesized that there would be a significant difference in the Agility ability between the subjects of yoga and Physical exercises group and control group, Hypothesis was formed on the rationale that the regular and continuous involvement in varied, high intensive and fast changing body moment activities are going to increase the flexion and extension ability in muscles, joint and tissue condition and working capacity of the practitioners, this would help to enhance the flexion and joint moment working capacity with reflexive action in the muscle system of the Physical exercises group. Hence, Physical exercises group will have better agility ability comparing to control and yoga exercise group of secondary school students. The data on Agility of the before and after training of the yogic and Physical exercises and control groups are analysed and presented in the Table 2.

**Table 2:** Computation of Covariance of Agility of control Group, Experimental group 1(Yogic Exercises) and Experimental group 2 (Physical Exercises) of Secondary school students

Source Variance	df	Sum of the Square	Mean squared	Remarks	Sig
Between the group	2	15.629	7.815	6.894	Sig
Within the group	296	335.517	1.134		

Significant at 0.05 levels

**Table 2A:** Agility mean differences of control group (A), Experimental group 1(B) (Yogic Exercise) and experimental group 2(C) (Physical Exercise)

Group	M1	M2	Diff	Significant
Group C & E1	17.675	17.796	-0.121	Ns
Group C & E2	17.675	16.916	0.759	Sig
Group E1 & E2	17.796	16.916	0.880	Sig

#### 2.3.1 Results and Findings on "Agility"

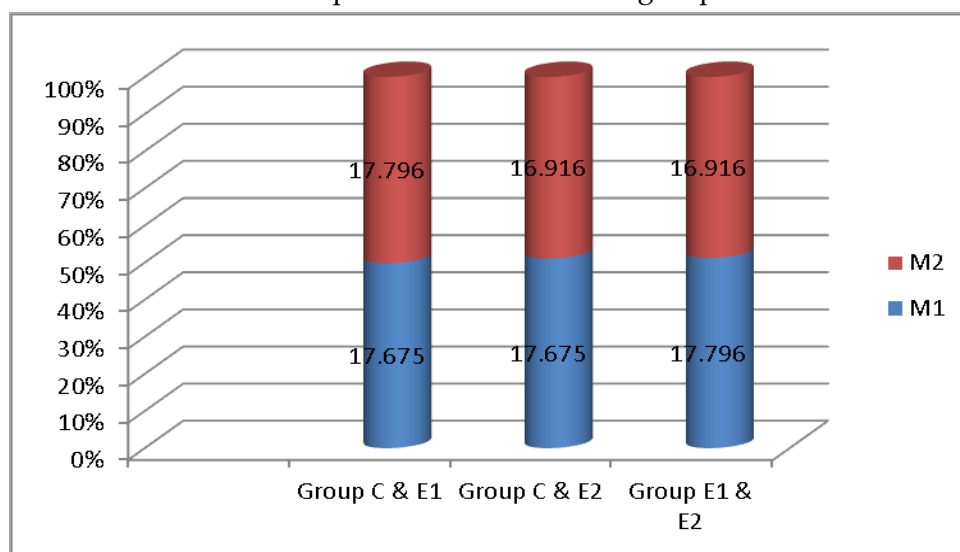
Table- 2-A shows the 'F' ratio of 6.894 which was greater than table value of 0.05 levels. Hence Scheff's Post Hoc test was employed to the data the score is 89.474 which was also found significant. Table-2-A (shows Scheff's Post Hoc test) shows the mean difference between the three groups. The difference between Group A (control group) and Group B (Yogic exercise) was -0.121. The difference between the Group A (control group) and Group C Experimental group (Physical Exercise) was 0.759. The difference

between Group B Experimental groups I (Yogic Exercise) and Experimental group II (Physical exercise) was 0.880. It is greater than table value that is 0.05 level.

### 2.3.2 Discussion on “Agility”

When we refer Table 2 it reveals that computed F ratio was greater than the table value and data was employed to find-out the adjusted paired means that was also significant. From the statistical analysis of the data, it was found that Physical exercise has improved agility than their counter part Yogic exercise and control group (Rathore .B.S et al 2009). It may be due to the reason that Physical exercise is having quick nature in performing activities and strenuous these factors might be contributed to develop the agility ability among the trainees, because agility requires the capacity to change their body position speedily in shortest time with limited space, but yoga would be performed in slow phase and steadily, as Patanjali saint has stated that Sthiram Sukkham Asanam, hence asana is expected to perform very slowly and steadily, that nature of activity gradually develop extension in muscles and joints that automatically creates elastic ability in the body that results in free and flexible movement among the practitioners, Yoga practice will make muscles flexible and increases the strength. Improves awareness, coordination and balance and make body to move freely and quickly. Hence formulated hypothesis is rejected alternative hypothesis is accepted.

**Figure 3:** The Graph-showing the mean difference of Agility ability between the experimental and control groups



### **3. Conclusion**

The practice of physical exercises were played significant role in developing Leg explosive power and improving the agility factors among the secondary school students, hence was recommended to that the curriculum and yoga syllabus must teach and practice effectively to notice the harmonious development of students.

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Rajkumar P. Malipatil, Sangeet S. Patil -  
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