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## Effect of yoga training on coordinative abilities of high school students

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### Abstract

The purpose of the study was to analyze the effect of Yoga programme on coordinative abilities of high school students. The experimental design of this study was random group design. For this purpose (N=40) forty high school students, of age group 13 to 15 years from GHSS kezhavoor, Trivandrum, Kerala, were selected. The subjects were divided into two groups of Twenty (n=20) each namely experimental group and control group. The experimental group underwent six weeks of Yoga programme on alternate days per week (Monday, Wednesday and Friday). The dependent variables selected for the study were selected coordinative abilities namely Eye Hand Coordination, Static Balance, Dynamic Balance and Reaction Time and the independent variable selected for the study were Yoga programme. The dependent variables selected were tested prior to and after the training program for both the groups using standardized tests. After the data collection the data were statistically examined by applying descriptive statistics and dependent 't' test. All the data were analysed using statistical package for social sciences (SPSS). The level of significance was fixed at 0.05 level. The result of the study indicated that there was a significant differences in coordinative abilities selected for this study.

**Keywords:** coordinative abilities, high school students

### Introduction

Developing coordinative abilities influences learning and perfecting new motor acts and their stability over time, promotes an efficient execution of motor acts and actions, in various conditions, supports better use of the other conditional abilities, encourages restructuring movements in high performance training phases and improving basic and applied motor skills (Neluta Smidu, 2014) Yoga has been acclaimed as one of the scientific mind-body training programme which helps to improve the coordinative abilities besides keeping the body physically, physiologically and mentally healthy. Yoga practice has been found effective in reduction in visual and auditory Reaction Times (Madanmohan, 1992). Yoga practice also helps to improve memory power (Singh, 1977). Yoga training affects the static and dynamic balance positively (Rasmi Muammer, 2015).

### Concept of yoga

Yoga refers to the union of the individual self with the universal self (Hadi, 2007). The Katha Upanishad is the first Vedic scripture use the word "Yoga" and define it as control of senses to achieve the supreme state. Although Yoga is said to be as old as civilization, there is no physical evidence to support this claim. Earliest archaeological evidence of Yoga's existence could be found in stone seals which depict figures of Yoga Poses. The stone seals place Yoga's existence around 3000 B.C. Scholars, however, have a reason to believe that Yoga existed long before that and traced its beginnings in Stone Age Shamanism. Shamanism contains Yoga elements (George Feuerstein, 2002). Hence Yoga has come from time immemorial. Yoga in India started as a part of living and also as a part of Indian culture. Yoga encompasses various domains, including ethical disciplines, physical postures, breathing techniques, dietary rules, meditations and spiritual practices. All aspects of yoga practice contribute to a state of deep relaxation in which both the body and mind experience calmness (Taso, 2014). Yoga is a science of life. It means union or join together. It is the union of body mind and spirit. Spirit is the animating principle or the consciousness force within us. Practice of yoga will help to keep

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the homeostasis of the body and mind because it works on the holistic principle of harmony and unification.

**Coordinative abilities**

They are complex psychometric qualities which imply the ability to quickly learn new moves, to rapidly and efficiently adapt to different conditions, specific to various types of activities, by restructuring the existing physical fundament (Neluta Smidu, 2014). They include manual dexterity or eye hand coordination, reaction time (audio and visual) and static and dynamic balance abilities etc.

**Eye Hand Coordination**

Ability to use the eyes and hands together in such a fixating, grasping and manipulating object; important in all activities requiring fine accuracy, such as shooting a basketball or hitting a baseball (Baumgartner, 2003).

**Static balance**

Static balance refers to the ability of a stationary object to balance against the centre of gravity in a still position. (Morrow, 2005).

**Dynamic balance**

Dynamic balance, on the other hand, is the ability of an object to balance while in motion or switching between positions (morrow, 2005).

**Reaction Time**

Reaction time is the amount of time it takes to respond to a stimulus

**Methodology**

**Source of data**

The data pertaining to the study was collected from the Gov higher secondary School kezhavoor

**Selection of subject**

40 boys and girls were selected from the Gov higher secondary school kezhavoor. Their age range of (13-15).

**Selection of variables**

Eye and hand co-ordination Static balance Dynamic balance Reaction time

**Collection of data**

The data were collected on coordinative abilities namely eye hand coordination, reaction time, static balance and dynamic balance for Yoga Group and Control Group using standardised tests one day before commencement of the Yoga training programme and recorded them as pre-test data. The

data on the same variables were again collected immediately after completion of the six weeks yoga training programme and recorded them as post test data. The identical conditions were kept by using the same apparatus, testing personnel and testing procedures.

**Experimental design**

The study was formulated as a true random group design, consisting of a pre-test and post-test. The subjects (n=40) were randomly assigned to two equal groups of twenty high school students each namely Yoga Group (YG) Control Group (CG). The Yoga Group were underwent Yogic Sukshma Vyayamas.

**Level of significance**

To test the hypothesis, the level of significance was set at 0.05 level.

**Statistical technique**

Descriptive statistics and Dependent ‘t’ test were applied to test whether there was any significant difference between the mean scores of pre and post-test of the experimental and control groups

**Discussion of findings**

All the subjects of the experimental groups underwent 6 weeks of yoga training for forty five minutes for a day. The result of the study indicates that the selected yoga programme had brought significant improvement on selected coordinative abilities of high school students. However control group did not show any improvement on selected variables as they were not involved in any type of training programme except their daily routine. The result of the study in a nutshell shows significant change in Eye Hand coordination, Static Balance, Dynamic Balance, and Reaction Time of the high school students. The synchronised movement with breath in asanas and pranayamas possibly made the smooth function of central nervous system and helped to improve the muscle tone thereby improving the neuromuscular coordination, which resulted in improving the eye hand coordination, reaction time. The results of the study are in conformity with the findings of Telles (2006), Sunita & Jay (2014), Sunita & Jay (2014), Madanmohan (1992) and Bhavanani (2003) who concluded that Yoga training had positively influenced the scores of eye hand coordination and reaction time. The balancing asanas especially Gaurdasana possibly influenced the vestibular system which is responsible to keep physical balance and might have increased the sense of both static and dynamic balance. The result of the study support the studies conducted by Ali *et al.* (2014), Hart (2008) who concluded that daily Yoga is effective in improving balance in those who practices yoga regularly.

**Table 1:** Mean Comparison of Experimental and Control group on Eye Hand Coordination

Control factors	Pre Test			Post Test			t-ratio
	N	Mean	SD	N	Mean	SD	
Experimental	20	16.15	4.02	20	17.15	3.84	4.156 *
Control	20	15.45	2.87	20	15.35	3.08	.698

t 0.05(1,19) = 2.093 \*significant at t.05 level

Table 4 above indicates that, there was significant difference between the pre and post test scores on experimental group’s eye hand coordination. The calculated ‘t’ value 4.156 is greater than tabulated ‘t’ value 2.09at 0.05 level of

significance with 19 degrees of freedom. In the case of control group there was no significant difference in eye hand coordination was found.

**Table 2:** Mean Comparison of Experimental and Control group on Static Balance

Control factors	Pre Test			Post Test			t-ratio
	N	Mean	SD	N	Mean	SD	
Experimental	20	3.65	2.03	20	4.95	2.14	5.940*
Control	20	5.65	3.07	20	5.7	2.92	.326

t 0.05(1,19) = 2.093 \*significant at t.05 level

Table 5 above indicates that, there was significant difference between the pre and post test scores on experimental group's static balance. The calculated 't' value 5.940 was greater than

tabulated 't' value 2.09 at 0.05 level of significance with 19 degrees of freedom. In the case of control group there was no significant difference in static balance.

**Table 3:** Mean Comparison of Experimental and Control group on Dynamic Balance

Control factors	Pre Test			Post Test			t-ratio
	N	Mean	SD	N	Mean	SD	
Experimental	20	74.85	6.26	20	76.7	5.89	4.883*
Control	20	71.5	7.52	20	71.35	7.48	.645

t 0.05(1,19) = 2.093 \*significant at t.05 level

Table 6 above indicates that, there was significant difference between the pre and post test scores on experimental group's dynamic balance. The calculated 't' value 4.883 was greater

than tabulated 't' value 2.09 at 0.05 level of significance with 19 degrees of freedom. In the case of control group there was no significant difference in dynamic balance.

**Table 4:** Mean Comparison of Experimental and Control group on Reaction Time

Control factors	Pre Test			Post Test			t-ratio
	N	Mean	SD	N	Mean	SD	
Experimental	20	20.75	3.78	20	18.85	2.89	6.190*
Control	20	19.75	3.24	20	19.65	3.20	.623

t 0.05(1,19) = 2.093 \*significant at t.05 level

Table 7 above indicates that, there was significant difference between the pre and post test scores on experimental group's reaction time. The calculated 't' value 6.190 was greater than tabulated 't' value 2.09 at 0.05 level of significance with 19 degrees of freedom. In the case of control group there was no significant difference in reaction time

### Conclusion

On the basis of the findings and within limitations of the present study the following conclusions were drawn.

1. The Yoga training group was better in improving the coordinative abilities namely Eye Hand Coordination, Static Balance, Dynamic Balance and Reaction Time as compared to Control Group (CG).
2. The present study revealed that regular practice of Yoga would help the students to improve coordinative abilities.
3. An integrated yoga training programme may be incorporated as a supplementary exercises with the conventional physical exercises to achieve overall fitness.

### Recommendation

In the light of conclusion drawn, the following recommendations are made

1. Yoga may be included in the school curriculum.
2. Similar study may be undertaken with female high school students.
3. Similar study may conduct taking larger samples than those used in the present study.
4. Similar study may be undertaken with all age groups.

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