

EFFECT OF HATHA YOGA AND AEROBIC DANCE PRACTICE ON REACTION TIME OF ADOLESCENT BOYS

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ABSTRACT

Yoga is an ancient Indian Philosophy. The purpose of the study was to evaluate psychological response and to find out the changes in reaction time, following the Yoga and aerobic dance practices. The total subjects were 120 divided into four groups and their age ranges from 12–16 years. The duration of total practice period were 6 weeks (3 days in a week for 30 minutes). Pretest and post test data were analyzed by paired ‘t’ test method. For obtaining the significant differences ANCOVA method was adopted (Garrett, 1981). The organised Yoga and aerobic dance program definitely improved their performance in selected psychological potentialities.

Keywords : Yoga, Aerobic dance, Reaction time

INTRODUCTION

The term Yoga is applied to the attainment of highest aim, i.e. integration of personality as well as the various methods and techniques used for the fulfilment of that aim. There are four basic forms of yoga: Karma Yoga : The Yoga of action Bhakti Yoga : Hatha Yoga, (Sanskrit: “Discipline of Force”) the school of Yoga that stresses mastery of the body as a way of attaining a state of spiritual perfection in which the mind is withdrawn from external objects. Hatha Yoga traces its origins especially to Gorakhnath, the legendary 11th-century founder of the Kanphata Yogis, but it grew out of yogic traditions dating back at least as far as Patanjali (2nd century BCE or 5th century CE), author of the Hindu classics the *Yoga-sutras* and the *Mahabhasya* (Great Commentary).

Hatha Yoga places great importance on diet, purificatory processes, regulation of breathing (*Pranayama*), and the adoption of bodily postures called *asanas*, which structure a program of physical exertion. A common *asana* is the *padmasana* (lotus posture), in which the crossed feet rest on the opposite thighs. This is the position in which many Hindu and Buddhist gods are often depicted, but it is only one of dozens described in Hatha Yoga treatises. The “salute to the sun” is a well-known sequence of 12 *asanas* performed in a fluid movement.

Hatha Yoga has grown in popularity in the West as a form of exercise that develops strength, flexibility, bodily relaxation, and mental concentration. Its true object, however, is to awaken the dormant energy (*shakti*) of Shiva that animates the subtle body but is concealed behind the gross human frame. The subtle anatomy containing it is usually described as a series of lotiform *chakras* (“wheels”) rising from the anal or genital area to the top of the head. Through the forceful suppression of physical and mental activity, the female *shakti* is enabled to rise along the *chakras* and unite with the male Shiva in the uppermost *chakra*, a union indistinguishable from enlightenment and even immortality. Yoga has a great antiquity, long tradition and is a result of thousands of years of careful and systematic exploration by the longtime of sages and Yogis on the basis of their meticulous observations and personal experiences. Yoga is science of life which helps man to attain his highest potential and highest state of consciousness. It has various psychological techniques involving asanas, Pranayamas etc

The yoga of devotion. Dynana Yoga: The yoga of knowledge. Raja yog: This is a system for control of the mind. The first three forms trace their origin in Bhagwat Gita. Components of Raja yog are Hatha Yoga, Mantra yog and Laya Yoga (Telang 1999). Hatha Yoga is thought to be the creation of the Lord Shiva and sage Patanjali is credited with propounding Hatha Yoga (Wikipedia). There are further more forms of yoga as indicated in various Texts and practiced. There are eight basic elements of yog hence also called ashtangs. They are Yam, Niyam, Asana, (Yogasan), Pranayam, Pratyahar, Dharana, Dhyan and Samadhi. Hatha Yoga Pradipika mentions Adinaath and his disciples Matsyendranath, Gorakhanath. Yoga is the science of life which helps man to attain his highest potential and highest state of consciousness. It has various psychological techniques involving asanas, Pranayamas etc.

The Origin of Yoga is in the ancient East; Yoga has gained massive popularity in the modern western world. Its image has evolved from those photos we may have seen of the extraordinary practice of unbelievably flexible cotton-clad ascetics in India, or the seventies hobby of hippy types! Yoga has become a part of the chosen lifestyle of thousands of westerners seeking some real balance, health and well-being in their lives.

Experiences of Yoga can be close to nature, out of doors or on bumpy ground in large tents with slightly slippery carpets on summer retreats or at festivals. However, it is also common now to see the wonderfully tranquil and well-equipped yoga studios in the towns and cities too.

Yoga teachers seem to be possibly even happier than DJ^s these days : They are making their own tracks with their bicycle, scooter, or nippy and travelling through city streets from one

class to another, taking life at their own chosen pace, spending their holidays in stunning places, teaching the much-appreciated techniques and principles of yoga to the enthusiastic city dwellers.

There are yoga magazines, gorgeous yoga holidays and a rainbow of great yoga kit one can buy. But, when it comes down to it, all you really need to get benefit from the ancient wisdom of yoga — one need to improve their own body, mind and spirit, some self-discipline, and a decent teacher to get you started.

In Sanskrit, ‘Ha’ means ‘Sun’ and ‘Tha’ means Moon. ‘Hatha’ means ‘forceful’ implying that powerful work must be done to purify the body. Yoga means to yoke, or to join two things together. Hatha Yoga is meant to join together sun (masculine, active) energy with the moon (feminine, receptive) energy, thus producing balance and greater power to an individual. It works to make the spine supple and to promote circulation of all organs, glands and tissues. Hatha Yoga postures also stretch and align the body by promoting balance and flexibility. Aerobic exercises such as aerobic dance, is a fun and a tool to make one fit. It reduces fat of a person. In this article, an attempt has been made to observe the improvement of the psychological variables by aerobic and Yoga practices among the adolescent. Aerobic dance and Hatha yoga have to produce improvements in psychological wellbeing. All ages can get benefit from aerobic dance. Aerobic dance is a popular exercise among adolescent pupils.

According to physiotherapist and yoga teacher, Patel (2008), there should be no adverse effects and pain relief is possible by practice of yogasanas by various mechanisms, relaxation of muscles or release of muscular tension; regulation of breath to increase pain tolerance; increased lubrication of joints reducing painful stiffness; improving pliability of soft tissues around joints and strengthening of antigravity mechanism for erect posture. She used yoga practices in four different ways: Personality development, stress management, complete health, disease prevention and cure. On the other hand, we should know that Reaction time may be defined simply as the time between a stimulus and a response and it has a lot of benefits on various type of activity. Here, I will discuss some important aspects of reaction time that is very important for our everyday lives. Reaction time is a good indicator of sensorimotor, coordination and performance of an individual.

There are many studies on increased physical function, slightly better levels of social functioning, and lower levels of sleep dysfunction and fatigue giving indications that yogasanas practice had positive effect on quality of life in this adverse and life threatening condition (Anderson, 2006). According to Mitra (2020), Hatha Yoga has positive effect on vital capacity.

PURPOSE OF THE STUDY

The purpose of the study was as follows:

- i) To observe the impact of hatha yoga and aerobic dance practice of adolescent boys.
- ii) To find out the changes if any in reaction time following the yoga and aerobic practices.

METHODOLOGY

The total subjects of my study were one hundred and twenty (120). The data has been selected from the school of Rabindra Vidyapith High School (H.S) The students who have participated in the study belongs to age group from 12–16 years. All the subjects possessed sound physique. All the subjects were divided into four groups i.e. Hatha Yoga, aerobic dance, combined and control groups.

PRACTICE SCHEDULE

The total period of treatments was 6 weeks and each group practiced three days in a week. The duration was 30 minutes which supervised exercise program for experimental subjects and control group continued usual activity. The subjects practiced the Asanas and Pranayamas.

CRITERIA MEASURED

Age, height and weight were measured by school record, stadiometer and weighing machine accordingly. Reaction time was measured by Nelson Hand Reaction Test (1965) accordingly. Experimental subjects completed a 6-week supervised exercise program. Control subjects continued usual activity. The subjects were practicing the Asanas & pranayama for 30 minutes / day & thrice a week Asanas were Tadasana, Tratayaka, chakrasana, Surja namaskar, Sarbagasana, Halasana etc. and Pranayamas were Bhastrika, Kapal bhati, Bhamari etc. Aerobic dance with music also were practiced thrice in a week and 30 mins. / day. For statistical analysis standard procedures have been adapted. Mean and SD were first computed. Then pretest and post test data were analyzed by paired 't' test method (Garrett, 1981). For obtaining the significant differences ANCOVA method (Garrett, 1981) was adopted.

For testing the differences between mean scores selected psychological variables of Hatha Yoga Group, Aerobic Dance Group, Combined Group (Hatha Yoga and Aerobic Dance) as Control Group of subjects. The level of significance were at 0.05 and 0.01 of confidence. The mean and SD

of their personal data (age, height and weight) were recorded on table 1(a) & 1(b).

Table – 1(a)

Pre-test: (Mean $\pm$ SD) of Yoga, aerobic dance, combined and control group variables

	Yoga Gr. Mean $\pm$ SD	Aerobic Dance Gr. Mean $\pm$ SD	Combined Gr. Mean $\pm$ SD	Control Gr. Mean $\pm$ SD
Personal Data				
Age	13.77 $\pm$ 1.25	13.8 $\pm$ 0.81	14.67 $\pm$ 0.99	14.90 $\pm$ 0.92
Height	141.70 $\pm$ 6.10	149.37 $\pm$ 4.43	151.3 $\pm$ 9.08	150.30 $\pm$ 8.54
Weight	38.67 $\pm$ 5.96	42.23 $\pm$ 4.72	42.70 $\pm$ 7.00	40.77 $\pm$ 5.1

Psychological variable

Reaction Time	0.1998 $\pm$ 0.04	0.216567 $\pm$ 0.02	0.214333 $\pm$ 0.02	0.2146 $\pm$ 0.02
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Table – 1(b)

Post-test: (Mean $\pm$ SD) of Yoga, aerobic dance, combined and control group variables

	Yoga Gr. Mean $\pm$ SD	Aerobic Dance Gr. Mean $\pm$ SD	Combined Gr. Mean $\pm$ SD	Control Gr. Mean $\pm$ SD
Personal Data				
Weight	37.13 $\pm$ 5.48	40.20 $\pm$ 4.24	41.70 $\pm$ 6.22	41.33 $\pm$ 5.40
Psychological variable				
Reaction Time	0.177967 $\pm$ 0.03	0.188533 $\pm$ 0.02	0.1826 $\pm$ 0.02	0.1949 $\pm$ 0.03

Personal Data

The age, height and weight of the subjects had been considered as personal variable.

Age : Mean scores and standard deviation of four groups of age were 13.77 $\pm$ 1.25, 13.8 $\pm$ 0.81, 14.67 $\pm$ 0.99 and 14.90 $\pm$ 0.92 years respectively in Table – 1(a).

Height : Mean scores and standard deviation of four groups of height were 141.70 ± 6.10 , 149.37 ± 4.43 , 151.37 ± 9.08 and 150.30 ± 8.54 cm. respectively in Table-1(a).

Weight : Mean scores and standard deviation of four groups of weight in pre-test were 38.67 ± 5.96 , 42.23 ± 4.72 , 42.70 ± 7.00 and 40.77 ± 5.16 kg respectively in Table-1(a) and Fig. No. 1. Post test weights mean and SD were 37.13 ± 5.48 , 40.20 ± 4.24 , 41.70 ± 6.22 and 41.33 ± 5.40 kg respectively in Table No.-1(b) and Fig. 1. After completion of the training programme mean scores of weight of all experimental groups have decreased slightly.

Psychological Variable: Reaction Time

In my study the psychological variable was reaction time.

Table – 2

Analysis of Variance (ANOVA) for reaction time among the four groups

Sources of Variation		Ss	df	Ms	F
Pre Test	Between groups	0.005	3	0.002	2.358
	Within groups	0.089	116	0.001	
	Total	0.094	119		
Post Test	Between groups	0.005	3	0.002	2.131
	Within groups	0.088	116	0.001	
	Total	0.093	119		

$$F_{0.05} = 2.68, F_{0.01} = 3.96$$

F is significant at both levels.

Table –3

Analysis of Covariance (ANCOVA) for reaction time among the groups

Source of Variation	df	SS _{XY}	SS _{YX}	MS _{YX} (V _{YX})	F _{YX}	SD _{YX}
Among Gr. Means	3	0.004	0.002	0.001	1.51	0.02
Within Gr. SS	115	0.051	0.059	0.001		
Total	118	0.054	0.062			

$$F_{0.05} = 2.68, F_{0.01} = 3.96$$

F is significant at both levels.

Table – 4

Significance of difference among adjusted Y Means of reaction time

Variables	SE _d	df	Diff. Adjusted Mean	Sig. at 0.05 or 0.01
Yoga vs. Aerobic dance Gr.	0.01	115	0.001	NS
Yoga vs. Combined Gr.	0.01	115	0.004	NS
Yoga vs. Control Gr.	0.01	115	0.008	NS
Aerobic dance vs. Combined Gr.	0.01	115	0.005	NS
Aerobic dance vs. Control Gr.	0.01	115	0.007	NS
Combined vs. Control Gr.	0.01	115	0.12*	0.05

*Sig. at 0.05 level, NS is Not Significant

From the Table No. 1(a) & 1(b), it was found that mean $\pm$ SD scores of reaction time before training of all the groups were 0.1998 ± 0.04 , 0.216567 ± 0.02 , 0.214333 ± 0.02 , 0.2146 ± 0.02 and after training were 0.177967 ± 0.03 , 0.188533 ± 0.02 , 0.1826 ± 0.02 , 0.1949 ± 0.03 respectively. Participating in yoga and aerobic dance programme all the experimental groups decreased (Table 1(a) & 1(b)) their reaction time. Since all the mean scores of reaction time were not equal, analysis of variance Table No. 2 was computed to find the significant differences among the four means. It was observed that the F value was not significant at both levels. ANCOVA (Table No. 3) was done to find out not significant effect after participating exercise programme among the groups. Lower the score better the result. It was observed that combined group increased at 0.05 level of confidence as compared to control group.

CONCLUSIONS

On the basis of the results and discussions, some specific conclusions may be drawn.

- Reaction time has been decreased in all groups.
- No significant result was found in all the groups except combined group.
- Combined group has been significantly decreased 0.05 level as compared to control group.

The organized Yoga and aerobic dance program has definitely improved their performance and psychological potentialities.

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