EFFECT OF YOGA PRACTICE AND PHYSICAL EXERCISES ON MAXIMUM OXYIGEN CONSUMPTION OF MIDDLE AGED MEN

K. Rajendran

Assistant Professor, Department of Physical Education and sports sciences, Annamalai University

ABSTRACT

The purpose of the study was to find out the effect of yoga practice and physical exercises on maximum oxygen consumption of middle aged men. To achieve the purpose of the study the investigator selected forty five middle aged men from the inhabitants of Chidambaram, Cudalore District, Tamilnadu, India as subject in the age group of 18 years to 23 years. They were divided into three equal groups of fifteen each (n=15) at random. Group-I performed yoga practice, group-II performed physical exercises and group-III acted as control. ANCOVA was used to find out the adjusted mean difference between the groups. The result of the study reveals that due to the effect of yoga practices and physical exercises the maximum oxygen consumption of the subjects was significantly improved. It is also concluded that no significant differences existed between yoga practices and physical exercises groups in improving the maximum oxygen consumption of middle aged men.

***Key Words**: Yoga practice and physical exercises, maximum oxygen consumption.*

INTRODUCTION

Good health means that all organs of the body are working efficiently. The important proverb is, 'Health is wealth', 'if health is lost everything is lost', and is realized more in its absence than by its presence. Middle age is not a time of life it is a state of mind. The importance of health is more than education, money and other material comforts. Happiness is intimately concerned more with good physical and mental health than other outside factors. At this stage, we need to know the essential conditions to keep ourselves healthy (Dev, 1999).

Yoga is an ancient science, based on the understanding of nature's laws. It has been practiced for thousands of years. Yoga is one of the most valuable gifts of Indian culture. It is a science and art of pure life style. It increases the intake of oxygen, and enhances the functioning of the respiratory, digestive, circulatory, endocrine, reproductive and excretory systems (Anandapadmanabam, 2005). Yoga is the uniting of individual soul to the universal soul, the union of the personal spirit to God. It is a system of spiritual and physical culture practiced from ancient times in India. It has been applied not only to the central aim of attaining heightened consciousness but also to the development of every human facilities like physical, emotional and ethical which may conduce to that end (Iyengar, 1968).

The main purpose of physical exercise is to increase the circulation of the blood and the intake of oxygen. This can be done by yoga's simple movements of the spine and various joints of the body with deep breathing, but without violent movements and asanas, the various blood vessels are pulled and stretched and blood is equally distributed to every part of the body. The stretched and blood is equally distributed to every part of the body. The stretched muscles and ligaments during yoga practices are immediately relaxed muscles. Fatigue appears after doing physical exercises. Physical exercises are repetitive movements whereas yoga exercise involves very little movement and only postures maintained for a period of time. Physical exercises lay emphasis on strong movements of muscles whereas yoga opposes violent movements.

Physical exercise increases the activity of the pulmonary and cardiovascular systems. It requires an increase in oxygen to be used and transported to the muscle. Conversely, anaerobic exercise is physical activity of a short duration and of less intensity than aerobic exercise. It does not require an increase in oxygen to be used and transported to the muscle. Physiological functions of the body may be improved by exercise. In order to assess the training impact on maximum oxygen consumption among middle aged men, the investigator selected yoga practice and physical exercises as the independent variables.

METHODOLOGY

Selection of Subjects and Variables

To achieve the purpose of the study the investigator selected forty five middle aged men from the inhabitants of Chidambaram, Cudalore District, Tamilnadu, India as subject in the age group of 18 years to 23 years. They were divided into three equal groups of fifteen each (n=15) at random. Group-I performed yoga practice, group-II performed physical exercises and group-III acted as control.All the subjects selected for the experimental treatment was subjected to medical evaluation and certification from a doctor ensuring their health capacities to undergo the

training program. The dependent variable selected for this investigation is maximum oxygen consumption and it was assessed by one mile run.

Training Programme

The training program was scheduled for one session a day each session lasted between forty five minutes to one hour approximately. Training programme was administered to the middle aged men for twelve weeks with six training units per week. The experimental group-I performed yoga practice and group-II performed physical exercises.

Collection of the Data

The pretest data was collected prior to the training programme and posttest data was collected immediately after the twelve weeks of yoga practice and physical exercises, from the experimental groups and a control groups.

Statistical Technique

The data collected from the three groups prior to and post experimentation on selected dependent variable was statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA). Since three groups are involved, whenever the obtained 'F' ratio value was found to be significant for adjusted post test means, the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. In all the cases the level of confidence was fixed at 0.05 for significance.

RESULT

The pre and post test data collected from the experimental and control groups on maximum oxygen consumption is statistically analyzed by using analysis of covariance and the results are presented in table–I.

Table – I: **Analysis of Covariance on Maximum Oxygen Consumptionof Experimental and Control Groups**

	Yoga Practices Group	Physical Exercises Group	Control Group	S o V	Sum of Squares	Df	Mean squares	'F' ratio
Pretest Mean SD	2.99	2.98	3.01	B	0.004	2	0.002	0.12
	0.15	0.14	0.14	W	0.857	42	0.020	
Posttest Mean SD	3.17	3.22	2.97	B	0.535	2	0.268	6.09*
	0.18	0.27	0.16	W	1.846	42	0.044	
Adjusted Posttest Mean	3.18	3.23	2.96	B	0.625	2	0.313	11.65*
				W	1.100	41	0.027	

(*Table value required for significance with degrees of freedom 2 & 42, 2 & 41 is 3.23)*

**Significant at 0.05 level of confidence*

Table-I shows that the pre-test means and standard deviation on maximum oxygen consumptionof yoga practices and physical exercises groups and control group are 2.99 ± 0.15, 2.98 ± 0.14 and 3.01 ± 0.14 respectively. The obtained 'F' value 0.12 of maximum oxygen consumptionis lesser than the required table value of 3.23 at 2, 42 df at 0.05 level of confidence, which proved that the random assignment of the subjects were successful and their scores on maximum oxygen consumptionbefore the training were equal and there was no significant differences.

The post-test means and standard deviation on maximum oxygen consumptionof yoga practices and physical exercises groups and control group are 3.17 ± 0.18, 3.22 ± 0.27 and 2.97± 0.16 respectively. The obtained 'F' value of 6.09 on maximum oxygen consumptionis greater than the required table value of 3.23 at 2, 42 df at 0.05 level of confidence. It implied that significant differences exist between the three groups during the post test on maximum oxygen consumption.

The adjusted post-test means on maximum oxygen consumptionof yoga practices and physical exercises groups and control group are 3.18, 3.23 and 2.96 respectively. The obtained 'F' value of 11.65 on maximum oxygen consumptionis greater than the required table value of 3.23 of 2, 41 df at 0.05 level of confidence. Hence, it is concluded that significant differences exist between the adjusted post test means of yoga practices and physical exercises and control groups on maximum oxygen consumption.

Since, the obtained 'F' value in the adjusted post test means is found to be significant, the Scheffe's test is applied as post hoc test to find out the paired mean difference, and it is presented in table-II.

Table –II:**Scheffe'sPost Hoc Test for the Differences among Paired Means of Experimental and Control Groups on Maximum Oxygen Consumption**

Yoga Practices	Physical Exercises	Control Group	Mean Difference	Confidence Interval
3.18	3.23		0.05	0.15
3.18		2.96	0.22*	0.15
	3.23	2.96	0.27*	0.15

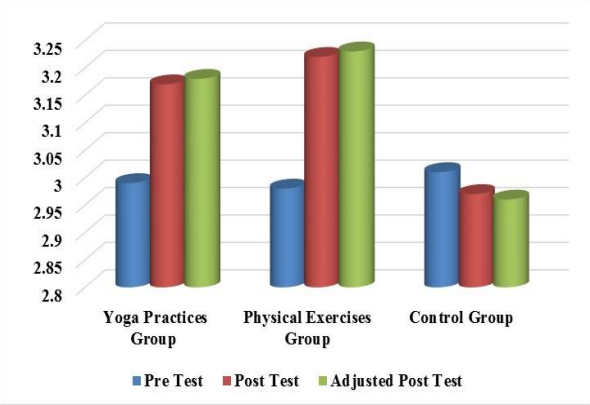
**Significant at 0 .05 level*

As shown in table-II the Scheffe's post hoc analysis proved that significant mean differences existed between yoga practices and control groups, yoga practices and physical exercises and control groups on maximum oxygen consumptionsince, the mean differences 0.22 and 0.27 are higher than the confident interval value of 0.15 at 0.05 level of significance. However the mean differences between yoga practices and physical exercises groups is (0.05) less than the confident interval value of 0.15 at 0.05 level of significance.

Hence, it is concluded that due to the effect of yoga practices and physical exercises the maximum oxygen consumptionof the middle aged men is significantly improved. It is also concluded that no significant differences existed between yoga practices and physical exercises in improving maximum oxygen consumptionof the middle aged men.

The pre, post and adjusted post test mean values of experimental and control groups on maximum oxygen consumption is graphically represented in figure-1

Figure – 1: Diagram Showing the Mean Values on Maximum Oxygen Consumption of Experimental and Control Groups



DISCUSSION

Substantial research has been conducted to look at the health benefits of yoga from the yoga postures (asanas), yoga breathing (pranayama), and meditation. The information on yoga poses and benefits are grouped into three categories such as physiological, psychological, biochemical effects. Furthermore, scientists have laid these results against the benefits of regular exercise. Practicing yogasana, an individual can remain cool, calm quiet interms of physical as well as mental (Jain, 2003).

Yogic practices demonstrated a significant difference in heart rate, with breathing practices and asanas lowering heart rate significantly so yogic practices into a lower-impact workout may be beneficial. Chaya *et al.,* (2008) reported that long-term practice of yogic asanas along with pranayama and meditation causes reduced sympathetic activity resulting in reduced metabolic rate and greater metabolic efficiency in yoga practitioners. Hagins *et al., (2007)* suggested that yoga is a mind-body practice where practice of physical postures is combined with control of breathing, meditation along with stretching exercise, isometric exercise, and dynamic exercises of skeletal muscles. Raub (2002) find that Practice of hatha yoga may help control such physiological variables as blood pressure, respiration, HR and metabolic rate to improve overall exercise capacity

Short-term daily conditioning protocol of aerobic exercise program induces significant improvements in both aerobic capabilities and anaerobic performance (Sartorio et al., 2003). The focus of aerobic training is to progressively overload the cardio respiratory system and not the musculoskeletal system. In response to an aerobic training program, Type I and II muscle fibers have been shown to remain the same (Bell et al., 2000; McCarthy et al., 2002), increase (Nelson, 1990), and decrease in size (Kraemer et al., 1995). More consistent and well documented adaptations to aerobic training include increases in capillary and mitochondrial densities (Crenshaw, 1991) as well as oxidative enzyme activity (Bell, 2000; Nelson, 1990) all of which contribute to the enhanced delivery, extraction, and utilization of oxygen by skeletal muscle.

CONCLUSION

The result of the study reveals that due to the effect of yoga practices and physical exercises the maximum oxygen consumption of the middle aged men was significantly improved. It is also concluded that no significant differences existed between yoga practices and physical exercises groups in improving the maximum oxygen consumption of the middle aged men.

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