

A STUDY OF EXERCISES AND CERTAIN YOGIC PRACTICES ON HEALTH RELATED PHYSICAL FITNESS

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ABSTRACT

The purpose of this study was to investigate the response "a study of exercises and certain yogic practices on health related physical fitness, cardio respiratory function. The average ages of subjects were 18-23 years. The subjects were divided into four groups. Experimental groups A, B and C and a control group D, each group of 20 subjects. The subjects were equated before collecting the data. The experiment was conducted for a period of 12 weeks, excluding the period required for measurement in the criterion measures. It was begin and end within the experimental period. The experiment groups A done 12 yogic practices and pranayams. The experimental group B performed exercise program whereas „C“ grouped done combined activities. The control group "D" was consists of daily routine. The performance of all the subjects of AAPHERD health related physical fitness test was recorded prior and after the experimental period. To establish the comparative effect of the yogic practices, exercises and health related physical fitness, the data were examined by applying analysis of co-variance. The level of significance was .05 percent.

Key Words: - *Yogic practices, health related physical fitness. Cardio respiratory function.*

INTRODUCTION

In the contemporary living style, physical fitness, health and nutrition seem to have gained a place of priority. One of the most important goals of physical education program is to develop physical fitness. Physical

fitness is considered as a pre-requisite to healthful and recreational living and is not an end into itself. Physical fitness can be health related in as much as it preserves healthful function of the body over extended periods of time in adults' life. Health related physical fitness components are those developments which are related to certain diseases.

Physical education acts as an intermediary between health and fitness, while the degree of physical fitness depends on the individual's state of health, constitution, present and previous activities.

YOGA

In Patanjali's Yoga-darsan an asana is defined as Sthirasukhamasanam (any posture that can be maintained with comfort is an 'asana'. Prayatnasaithil yanantsamapattibhyam (lack of effort and contemplation as if it is never going to end characterize it). Apart from contraction and relaxation, there is third state of muscle which is known as the 'Catch' state. It is the ligament like contracted state of muscle which has been well studied biologically in the bivalve mollusks. It is characterized by maintenance of high tension without consumption of energy. A catch state could be very useful for a yogi which in to stay in a single posture for prolonged period for other advanced practices.

OBJECTIVE OF THE STUDY

1. To find the yogic and exercise programs would improve the health related physical fitness. cardio respiratory function
2. To find the yogic program would be more effective than exercise program in the health related physical fitness.
3. To find the further a combined exercise yogic program would be more effective in health related physical fitness than the individual programs of yoga and exercise.

STATEMENT OF THE PROBLEM

The purpose of this study was to investigate the response "A STUDY OF EXERCISES AND CERTAIN YOGIC PRACTICES ON HEALTH RELATED PHYSICAL FITNESS". CARDIO RESPIRATORY FUNCTION.

HYPOTHESIS

Keeping in view the objectives of the study following hypotheses were formulated –

1. It is hypothesized that yogic and exercise programs would significantly improve the health related physical fitness.
2. It is hypothesized that yogic program would be more effective than exercise program in the health related physical fitness.
3. It is further hypothesized that a combined exercise yogic program would be more effective in health related physical fitness than the individual programs of yoga and exercise.

DELIMITATIONS

1. The study was delimited to male subject of age group 18 to 23 years.
2. The studies was also delimited by certain yogic practices, which included specific asanas, pranayama and yognidra.
3. The study was further delimited to certain exercise.
4. It was delimited to certain health related physical fitness.

LIMITATIONS

1. Variation in the ability of the individual to perform yogic practices and exercise.
2. Variation in age group.
3. Variation in somato type.

METHODOLOGY

Selection of Subjects

Eighty subjects of Arts and Engineering class students of Andhra University, Visakhapatnam, Andhra Pradesh were selected for the study. The average ages of subjects were 18-23 years. The subjects were divided into four groups. Experimental groups A, B and C and a control group D, each group of 20 subjects. The subjects were equated before collecting the data. The experiment was conducted for a period of 12 weeks, excluding the period required for measurement in the criterion measures. It was begin and end within the experimental period. The experiment groups A done 12 yogic practices and pranayams. The experimental group B performed exercise program whereas „C“ grouped done combined activities. The control group "D" was consists of daily routine. The

performance of all the subjects of AAPHERD health related physical fitness test was recorded prior and after the experimental period.

Criterion Measure

The AAPHERD Health related physical fitness test contains four items intended to assess an individual's status on four components of health related physical fitness, brief statements indicating the reasons for their selection and the test items chosen to represent them.

AAPHER Health Related Physical Fitness Test: In 1980, the concept of fitness testing was modified due to the inclusion of additional emphasis on health related physical fitness test items. Subsequently AAPHER, 1976 fitness test, which was developed to measure the general motor ability of young boys, was again revised in 1980 and was converted to AAPHER Health Related Physical Fitness Test. It intends to assess an individual's four components of health related physical fitness namely cardio respiratory function, This test included the following four test items -Cardio respiratory function test - 9 minute run walk.

Cardio respiratory function Test-9 minute run- walk

Equipment: Track or marked area and stopwatch.

Test administration: The subject is asked to take a standing start, to be ready, and Go. The subject covers as much distance as possible in nine minutes. If the track and running area is marked at every 200 yards, the tester can count the number of laps completed and additional incomplete lap distance covered in 9 minutes respectively. Although the tester has to encourage all the subjects to run the entire period of 9 minutes but interspersed walking is allowed and total distance covered exactly in 9 minutes is recorded and connected up to one yard.

Scoring: The interval between the starting signal and the instant subject crosses the finish line is the score of the test. The time is recorded correctly up to tenth of a second.

PROCEDURE OF EXPERIMENT

The experiment was conducted for a period of twelve weeks excluding the period required for the measurement, in the criterion measure at the beginning and the end of the experimental period.

The experimental group "A" did 12 yogic practices program as given below:

1. Srishasana
2. Sarvangasana
3. Matsyasana
4. Halasana
5. Bhujangasana
6. Salbhasana
7. Dhanurasana
8. Aradhamatsyandrasana
9. Pachimotana
10. Mayrasana/shavasana
11. Kapal Bhati
12. Anlom vilom

The experimental group "B" did 10 exercises program as given below:

1. Spinal rock
2. Back over
3. Side stretcher
4. Alternative prone lift
5. One leg jumping
6. Line walking after front roll
7. 5 meters dash
8. Raising the hands with folded hands
9. Walking on hands with partner
10. Stride stretcher

The experimental group "C" did exercise and yogic practices program combined. The experimental groups practiced 6 days in a week.

TRAINING PROGRAM

The whole training program for the experimental group "A", "B" and "C" was carefully and systematically planned. The experimental groups "A", "B" and "C" underwent the training program on yogic practices, exercises and the combined respectively under the guidance of three assistance at same place and time under careful supervision of the research scholar for a period of twelve weeks in the 6 day week. The objective reflected exactly what was expected of the subjects after going through the training program.

The control group "D" was not allowed to undergo the training program.

EXPERIMENTAL DESIGN

The subjects were assigned to four groups by random sampling procedure as suggested by Robert and James (1969). Training program for experimental groups 'A', 'B' and 'C' consisted of yogic practices, exercises and combined program. The controlled group 'D' consisted of daily routine. The performance of subjects in AAPHERD health related physical fitness test was recorded prior and after the experimental period.

STATISTICAL PROCEDURES

To establish the comparative effect of the yogic practices, exercises and health related physical fitness, the data were examined by applying analysis of co-variance. The level of significance was .05 percent.

ANALYSIS OF DATA AND RESULT OF THE STUDY

RESULT OF THE STUDY

The statistical analysis of data (Cardio respiratory endurance test collected on 80 male subjects belonging to three experimental groups and one control group, each comprising twenty subjects, is presented. Group 'A' B and C were trained by yogic practices, Exercise and combined Exercise respectively and group D' served as control.

The data was examined in applying analysis of co-variances (ANCOVA Test) with regard to three experimental groups and one control group to find out the inter group variability to allow for the comparison between initial and final scores and to effect adjustments in final on terminal scores which allowed for difference in some initial variables.

The subject of three experimental groups and control group was selected at randomly and was not equated with reference to the factor examined. Hence the differences between the initial means of the groups at pre-test had to be taken into account during analysis of the post test differences between the means by process of application of analysis of covariance where the final means was adjusted for differences in the initial mean and the adjusted means were tested for significance.

RELIABILITY OF DATA

The reliability of data of the subjects was computed by correlating the scores of first day with next day score of cardio respiratory endurance test at the beginning of experiment and reliability co-efficient was .80, and 84,. respectively.

LEVEL OF SIGNIFICANCE

To find out the differential effect of the treatment using the analysis of co-variance, the level of significance was set at .05 level of confidence which was considered adequate and appropriate for the purpose of the study.

FINDINGS

The significant difference between pre and post experimental of means of the three experimental groups and one control group, the data was subjected to t-test. The analyses of data through t-test for each of the chosen variables are presented below in table no.1, 2 and 3.

TABLE-1
SIGNIFICANCE OF DIFFERENCE BETWEEN PRE-TEST AND POST TEST MEANS OF EXPERIMENTAL GROUPS AND THE CONTROL GROUPS IN CARDIORESPIRATORY ENDURANCES TEST

Group	Pre-Test	Post-test	Mean difference	DM	't' ratio
Asanas	1.42	1.59	0.18	0.017	10.57*
Exercise	1.62	1.77	0.16	0.014	11.6*
Combined	1.66	1.82	0.157	0.011	15.7*
Control	1.43	1.40	-0.033	0.011	-3.3

*Significant difference at .05 level

TABLE-2
ANALYSIS OF COVARIANCE OF THE MEANS OF THREE EXPERIMENTAL GROUPS AND THE CONTROL GROUP IN CARDIORESPIRATORY ENDURANCE TEST

	GROUP				Source of Variance	Sum of Squares	Df	Mean Squares	Obtained F
	Asanas	Exercise	Combined	Control					
Pre-Test Mean	1.409	1.611	1.650	1.425	Between	0.932	3	0.32	1.82
					Within	13.65	76	0.78	
Post-Test Mean	1.579	1.77	1.806	1.393	Between	2.14	3	0.72	18.69*
					Within	0.039	76	0.039	
Adjusted Post -Test Mean	1.554	1.742	1.779	-1.413	Between	1.579	3	0.527	17.54
					Within	2.321	76	0.031	

*Significant at 0.05 level N=20

B: Between group variance , W: Within group variance, F ratio needed for significance at 0.05 level of confidence 2.74.

The Analysis of co-variance for Cardio respiratory indicated that the resultant F ratio of 1.82 was not significant in case of pre-test .Means indicating that initial means differences among the group was not significant. The post test means of all the four group yielded an F ratio of 18.69 which was significant. The differences between the adjusted final means for four groups were found significant as the obtained F ratio was 17.54, Tabulated F ratio being 2.74.

As the difference between the post-test means and the adjusted final means for four groups were found significant, the critical difference for adjusted mean was applied to find out which of the differences between the post test mean were most significant. Differences between the paired adjusted final means are shown in table-.3

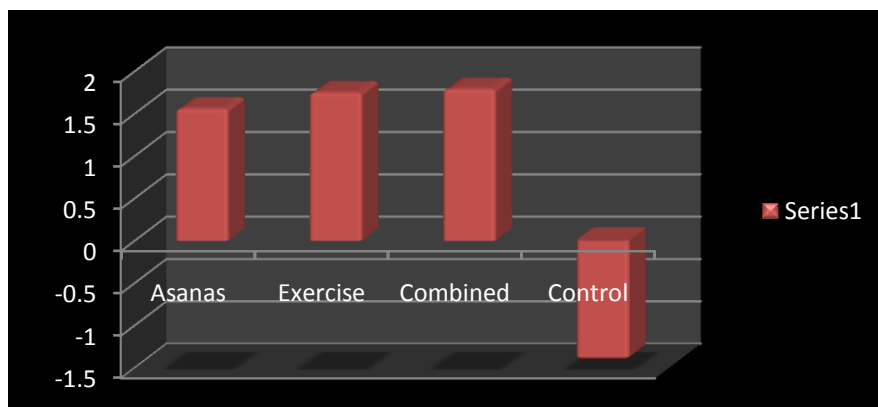
TABLE - 3
PAIRED ADJUSTED FINAL MEANS AND DIFFERENCES BETWEEN MEANS FOR THE THREE EXPERIMENTAL GROUPS AND THE CONTROL GROUP IN CARDIORESPIRATORY ENDURANCE TEST

Mean				Difference between means	Critical difference for adjusted mean
Asanas	Exercise	Combined	Control		
1.56	1.75			0.189*	0.10
1.56		1.79		-0.038	0.10
1.56			-1.42	0.329*	0.10
	1.75	1.79		-0.226*	0.10
	1.75		-1.42	0.142*	0.10
		1.79	-1.42	0.337*	0.10

*Significant at 0.05 level

The analysis of data in the table had revealed that combined, exercise and yogic practices program is more effective in enhancing the cardiorespiratory endurance performance than individual programs of yoga and exercise. However yoga program proved to be least effective in improving the cardio respiratory endurance performance.

Figure - 1
PAIRED ADJUSTED FINAL MEANS AND DIFFERENCES BETWEEN MEANS FOR THE THREE EXPERIMENTAL GROUPS AND THE CONTROL GROUP IN CARDIORESPIRATORY ENDURANCE TEST



DISCUSSION OF FINDINGS

The analysis of data revealed that the three experimental groups trained by exercises, yogic practices, and combined exercises and yogic practices, showed significant gain in performance of health related physical fitness

(cardiorespiratory endurance,). The mean gain achieved by combined exercise and yogic practices groups was higher in cardiorespiratory. The control group did not show any significant increase in the performance of health related physical fitness.

The result of the study confirm the notion that exercise and yogic practices improves health related physical fitness, when administered according to the set principles of training in a progressive manner and perform in proper way.

Our findings tend to support the findings of Hular E. (1995), Robin (1986). This finding calls for a changed exercises and yogic practices program (combined) for better result in muscular endurance. The improvement in muscular endurance was due to the fact that physical exercise, yogic practices and combined practice optimize the active body mass greater the active body mass, greater the maximal or absolute strength. The myosin and Actine filament increase.

Exercise and yogic practices are performed to increase the size of the muscle cross-section intra and inter muscular coordination, anatomical structure, as well as the elasticity of muscles and they make the muscles' hypertrophied and they increase their strength by increasing muscle mass (therefore total body mass). Regular exercise develops muscles fiber and they can improve the muscular strength. Our findings are supported by Satti, B, Gollinick P.P. (1983), Ganguly S.K. and Gharote M.C. (1989) who all had emphasized the importance of exercise and yogic practices for improving performance in health related physical fitness.

Cardiorespiratory endurance could be improved by the practice of exercise. It was also founded that for some health related variables yogic practices are more effective in comparison to exercise but when these both groups are compared with the combined of exercise and yogic program, a significant improvement in health related fitness variables of the study was seen.

Earlier researcher revealed that both short term and long term yoga practices help in improving cardiorespiratory endurance (Ganguly and Gharote, 1989, Ganguly, et al., 1998, Maily and Samahta, 2004). Due to fact that combined practices, physical exercise and yogic practices had caused and increased the size of lungs, stretch of the alveoli and improvement upon the efficiency in intercostals muscles. Hence an increased efficiency in lungs, which now bears less strain, increases the cardiorespiratory endurance.

The first effect of yogic training program on the cardiorespiratory endurance initiates changes in the heart. Training has been shown to increase the size of the heart. The increase in heart size may arise due to an increase

in the size of the heart cavities (ventricles and atria) as well as an increase in the thickness of the walls of the heart. The benefits to the cardiovascular system realized by an increase in the heart size include the larger atria and ventricles which allow a greater volume of the blood to be pumped each time, the heart beats and the increased thickness on the walls of heart also increases in the stroke volume.

Increased capillarization (number of capillaries in a given space) is another benefit that may rise as a result of cardiorespiratory endurance training. An increased capillarization allows a greater surface area and reduces distance between the blood and the surrounding tissues, thus increasing diffusion capacity of oxygen and carbon dioxide as well as increase in the transport of nutrients to cells.

The present findings suggested that exercise with the yogic practices together can be best method for improving the cardiorespiratory endurance. Our findings are also supported by the findings of Nandi and Adhikari (1999), Khodeskar (1988), Robson (1973).

Combined exercise yogic program was also more effective than asanas program in reduction of triceps and subscapular skin fold thickness.

The present findings suggest that exercises with the yogic practices together can be best method of decreasing the body composition. Our findings are supported by the findings of Ulter et al. (1998), American Heart Association (2006), Miller et al. (1997), Verketreddy (1990).

According to different studies, with yogic practices and pranayama one can expect an additional loss amounting to between 0.2 lbs depending on the frequency and duration on the yogic practices, pranayama performed.

Although this might not seem like a great deal, it is important to remember that moderate breathing exercise is a key factor in preventing weight regain following a restricted calorie diet. Yogic practices and exercise practices help counteract the lenient environment that, often time's influences reduced obese subjects to regain weight.

We know that any energy providing source like carbohydrates, protein and fat can provide energy only in the presence of oxygen. Doing yogic practices, pranayama enhances the oxygen level of the body which initiates greater utilization of fat as metabolic fuel.

Athlete's physical education teacher, coaches, and sports scientists always researches ways to improve performance through efficient, effective procedures. Not only does this study reinforce the effectiveness of exercises and yogic practices techniques for increasing the health related physical fitness but may also provide information on ways in which the time can be saved and at the same time the health related physical fitness can be improved effectively.

CONCLUSIONS

Based on the understanding after deliberate discussion with experts and the supervisor and also in light of the above understanding following conclusions were finally drawn:-

1. There is significant difference in pre and post test mean values of Cardio-respiratory Endurance for yogic practices, combined group as the obtain t-values are 10.56, 11.5, 15.6 respectively at .05 level of significance.
4. The post test means of the entire four groups for cardio-respiratory endurance yielded an F ratio of 18.68 which was significant. The differences between the adjusted final means for four groups were found significant as the obtained F ratio was 17.53, Tabulated F ratio being 2.74.
6. It is concluded that yogic and exercise programs significantly improve the health related physical fitness.
7. The yogic program is more effective than exercise program in the health related physical fitness.
8. A combined exercise yogic program is more effective in health related physical fitness than the individual programs of yoga and exercise.

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