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Effect of Yogic Practices, Aerobic Exercise and Interval Training on Selected Health Related Physical Fitness Components among School Boys

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Abstract

The purpose of the study was to determine the best training packages among the yogic practices, aerobic exercise and interval training on selected health related physical fitness namely cardio respiratory endurance and flexibility among school boys. To achieve the purpose of the present study, sixty school boys from Dindigul district, Tamilnadu were selected as subjects at random and their ages ranged from 13 to 17 years. The subjects were divided into four equal groups of fifteen school boys each. The study was formulated as a true random group design, consisting of a pre-test and post-test. The subjects (N=60) were randomly assigned to four equal groups of fifteen school boys each. The groups were assigned as yogic practices, aerobic exercises, interval training and control group in an equivalent manner. The group I underwent yogic practices, group II underwent aerobic exercises, group III underwent interval training and group IV acted as a control group. The three experimental groups were participated the training for a period of twelve weeks to find out the outcome of the training packages and the control group did not participated in any training programme. The variable to be used in the present study was collected from all subjects before they have to treat with the respective treatments. It was assumed as pre-test. After completion of treatment they were tested again as it was in the pre-test on all variables used in the present study. This test was assumed as post-test. The following statistical techniques were adopted to treat the collected data in connection with established hypothesis and objectives of this study. Analysis of covariance (ANCOVA) was applied because the subjects were selected random, but the groups were not equated in relation to the factors to be examined. Hence the difference between means of the four groups in the pre-test had to be taken into account during the analysis of the post-test differences between the means. This was achieved by the application of the analysis of covariance, where the final means were adjusted for differences in the initial means, and the adjusted means were tested for significance. Whenever the adjusted post-test means were found significant, the scheffe's post-hoc test was administer to find out the paired means difference. To test the obtained results on variables, level of significance 0.05 was chosen and considered as sufficient for the study. The significant mean difference does not exist among the experimental groups in the pre test on cardio respiratory endurance and flexibility. In testing post test mean difference among the experimental groups statistically significant on variables of cardio respiratory endurance and flexibility. In testing the post adjusted mean among the experimental groups also predicts the above result. In comparing the effect the YPG showed better performance on flexibility. In comparing the effect the AEG and ITG produced similar effect on both the variables.

Keywords: Yogic Practices, Aerobic, Interval Training, School.

Introduction

In recent years, yoga has been steadily gaining popularity as a means to get and stay fit and healthy and achieve more balance and harmony in an often busy world. Originally designed to purify the body and provide the physical strength and stamina required for long periods of meditation, hatha yoga, or the practice of physical postures known as asanas, also opens many channels of the body, especially the spine, so that energy can flow freely. Ultimately, people who practice yoga regularly not only feel better physically but also report an increased sense of happiness and peace within themselves and with the world around them. Yoga shows us all happiness is within ourselves and trying to quench desires is like pouring ghee on fire which only makes it blaze more instead of putting it out. So with desire, it is never satisfied. Yoga shows us that happiness for which we are eternally searching can be obtained through non-desire. To achieve a state of non-desire, the mind must be trained to think clearly. A healthy mind requires a healthy body. This is where Hatha Yoga comes in. Yoga, a Vedic science has been applied in the field of therapeutics in modern times. Yoga has given patients the hope to reduce medication besides slowing the progression of the disease. Yoga employs stable postures or asana and breath control or pranayama. It has already proven its mettle in the improvement of oxidative stress as well as

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in improving the glycaemic status of diabetics through neuroendocrinal mechanism (Eugene, 1997).

Aerobic exercise is a moderate intensity workout that extends over a certain period of time and uses oxygen in this process. Aerobics has become the most happening workout trend among the youth. Not only is performing aerobic exercise interesting, but also is very beneficial for health. There are different types of aerobics like fitness walking, jogging, swimming, kickboxing, inline skating, bicycling etcetera. In line skating or rollerblading is one of the most popular sports that are luring millions of people into trying it. It helps to strengthen lower back and works a great deal in enhancing cardiovascular development (Cooper, 1985). Interval training works both the aerobic and the anaerobic system. During the high intensity efforts, the anaerobic system uses the energy stored in the muscles (glycogen) for short bursts of activity. Anaerobic metabolism works without oxygen, but the by product is lactic acid. As lactic acid builds, the athlete enters oxygen debt, and it is during the recovery phase that the heart and lungs work together to "pay back" this oxygen debt and break down the lactic acid. It is in this phase that the aerobic system is using oxygen to convert stored carbohydrates into energy. It's thought that by performing high intensity intervals that produce lactic acid during practice, the body adapts and burns lactic acid more efficiently during exercise. This means athletes can exercise at a higher intensity for a longer period of time before fatigue or pain slows them down (Elmer et al. 2015).

Methodology

The purpose of the study was to determine the best training packages among the yogic practices, aerobic exercise and interval training on selected health related physical fitness namely cardio respiratory endurance and flexibility among school boys. To achieve the purpose of the present study, sixty school boys from Dindigul district, Tamilnadu were selected as subjects at random and their ages ranged from 13 to 17 years. The subjects were divided into four equal groups of fifteen school boys each. The study was formulated as a true random group design, consisting of a pre-test and post-test. The subjects (N=60) were randomly assigned to four equal groups of fifteen school boys each. The groups were assigned as yogic practices, aerobic exercises, interval training and control group in an equivalent manner. The group I underwent yogic practices, group II underwent aerobic exercises, group III underwent interval training and group IV acted as a control group. The three experimental groups were participated the training for a period of twelve weeks to find out the outcome of the training packages and the control group did not participated in any training programme. The variable to be used in the present study was collected from all subjects before they have to treat with the respective treatments. It was assumed as pre-test. After completion of treatment they were tested again as it was in the pre-test on all variables used in the present study. This test was assumed as post-test. The following statistical techniques were adopted to treat the collected data in connection with established hypothesis and objectives of this study. Analysis of covariance (ANCOVA) was applied because the subjects were selected random, but the groups were not equated in relation to the factors to be examined. Hence the difference between means of the four groups in the pre-test had to be taken into account during the analysis of the post-test differences between the means. This was achieved by the application of the analysis of covariance, where the final means were adjusted for differences in the initial means, and the adjusted means were tested for significance. Whenever the adjusted post-test means were found significant, the scheffe's post-hoc test was administer to find out the paired means difference. To test the obtained results on variables, level of significance 0.05 was chosen and considered as sufficient for the study.

Results

Table I. Computation of Analysis of Covariance of Yogic Practices, Aerobic Exercises, Interval Training and Control Groups on Cardio respiratory endurance (YPG, AEG, ITG & CG)

	YPG	AEG	ITG	CG	Source of Variance	Sum of Squares	df	Means Squares	F-ratio
Pre-Test Means	2051.66	2057.00	2045.33	2046.93	**BG**	1241.13	3	413.71	0.46
					WG	49371.60	56	881.63	
Post-Test Means	2364.33	2477.33	2469.33	2049.66	**BG**	1807095.00	3	602365.00	458.61*
					WG	73553.33	56	1313.45	
Adjusted Post-Test Means	2364.22	2476.83	2469.69	2049.91	**BG**	1796925.56	3	598975.18	449.54*
					WG	73282.06	55	1332.40	

Table – I reveals that the indicated that the obtained 'F'-ratio for the pre-test means among the groups on cardio respiratory endurance were 2051.66 for experimental group – I, 2057.00 for experimental group - II, 2045.33 for experimental group - III and 2046.93 for control group. The obtained 'F'-ratio 0.46 was lesser than the table 'F'-ratio 2.76. Hence the pre-test mean 'F'-ratio was insignificant at 0.05 level of confidence for the degree of freedom 3 and 56. The post-test means were 2364.33 for experimental group – I, 2477.33 for experimental group – II, 2469.33 for experimental group - III and 2049.66 for control group. The obtained 'F'-ratio 458.61 was higher than the table 'F'-ratio 2.76. Hence the post-test mean 'F'-ratio was significant at 0.05 level of confidence for the degree of freedom 3 and 56. The adjusted post-test means were 2364.22 for experimental group – I, 2476.83 for experimental group – II, 2469.69 for experimental group - III and 2049.91 for control group. The obtained 'F'-ratio 449.54 was higher than the table 'F'-ratio 2.77. Hence the adjusted post-test mean 'F'-ratio was significant at 0.05 level of confidence for the degree of freedom 3 and 55. It was concluded that there was a significant mean difference among yogic practices group, aerobic exercises group, interval training group and control group, in improving cardio respiratory endurance of the school boys.

Figure I. Adjusted Post Test Mean Values of the Yogic practices, Aerobic exercises, Interval training and Control Groups on Cardio respiratory endurance (YPG, AEG, ITG & CG)

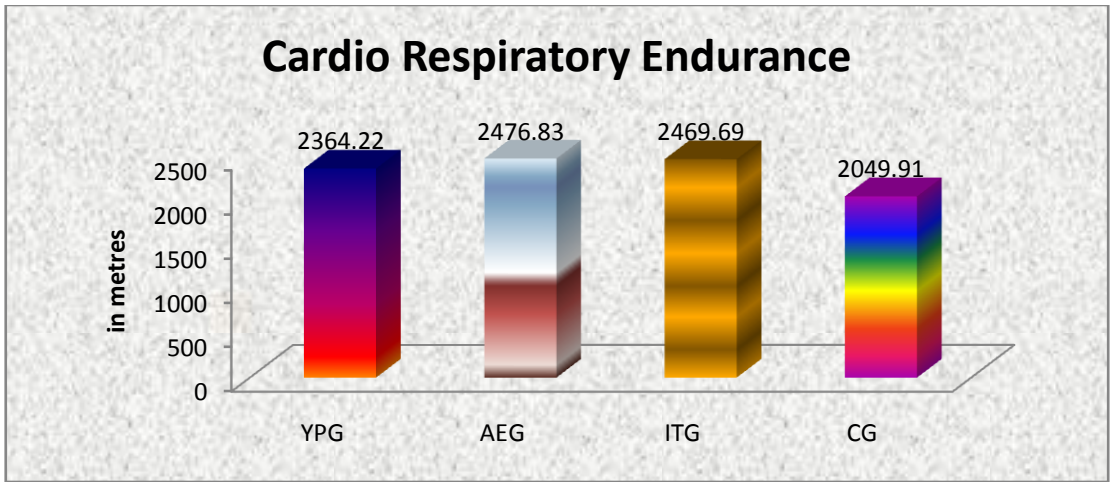

Table II. The Scheffe's Test for the Differences between the Adjusted Post Test Means on Cardio Respiratory Endurance

Adjusted Post-Test Means				Mean Difference	Confidence Interval
YPG	AEG	ITG	CG		
2364.64	2476.83	---	---	112.61*	38.35
2364.64	---	2469.69	---	105.47*	
2364.64	---	---	2049.91	314.31*	
---	2476.83	2469.69	---	7.14	
---	2476.83	---	2049.91	426.92*	
---	---	2469.69	2049.91	419.78*	

**** Significant at 0.05 level of confidence***

Table II shows the post hoc analysis obtained on adjusted post test means. The mean difference required for the confidential interval to be significant was 38.35. It was observed that the aerobic exercises group significantly increased cardio respiratory endurance better than the yogic practices group and control group. The interval training group significantly increased cardio respiratory endurance better than the yogic practices group and control group. The yogic practices group significantly increased cardio respiratory endurance better than the control group. Hence the aerobic exercises group and interval group produced similar effect on cardio respiratory endurance.

Table III. Computation of Analysis of Covariance of Yogic Practices, Aerobic Exercises, Interval Training and Control Groups on Flexibility (YPG, AEG, ITG & CG)

	YPG	AEG	ITG	CG	Source of Variance	Sum of Squares	df	Means Squares	F-ratio
Pre-Test Means	37.42	36.12	37.43	36.83	**BG**	17.09	3	5.69	0.95
					WG	332.67	56	5.94	
Post-Test Means	51.24	43.24	43.81	37.05	**BG**	1517.69	3	505.89	137.00*
					WG	206.78	56	3.69	
Adjusted Post-Test Means	51.22	43.26	43.80	37.05	**BG**	1499.13	3	499.71	133.07*
					WG	206.53	55	3.75	

Table – III reveals that the indicated that the obtained 'F'-ratio for the pre-test means among the groups on flexibility were 37.42 for experimental group – I, 36.12 for experimental group - II, 37.43 for experimental group - III and 36.83 for control group. The obtained 'F'-ratio 0.95 was lesser than the table 'F'-ratio 2.76. Hence the pre-test mean 'F'-ratio was insignificant at 0.05 level of confidence for the degree of freedom 3 and 56. The post-test means were 51.24 for experimental group – I, 43.24 for experimental group – II, 43.81 for experimental group - III and 37.05 for control group. The obtained 'F'-ratio 137.00 was higher than the table 'F'-ratio 2.76. Hence the post-test mean 'F'-ratio was significant at 0.05 level of confidence for the degree of freedom 3 and 56. The adjusted post-test means were 51.22 for experimental group – I, 43.26 for experimental group – II, 43.80 for experimental group - III and 37.05 for control group. The obtained 'F'-ratio 133.07 was higher than the table 'F'-ratio 2.77. Hence the adjusted post-test mean 'F'-ratio was significant at 0.05 level of confidence for the degree of freedom 3 and 55. It was concluded that there was a significant mean difference among yogic practices group, aerobic exercises group, interval training group and control group, in improving flexibility of the school boys.

Figure II. Adjusted Post Test Mean Values of the Yogic practices, Aerobic exercises, Interval training and Control Groups on Flexibility (YPG, AEG, ITG & CG)

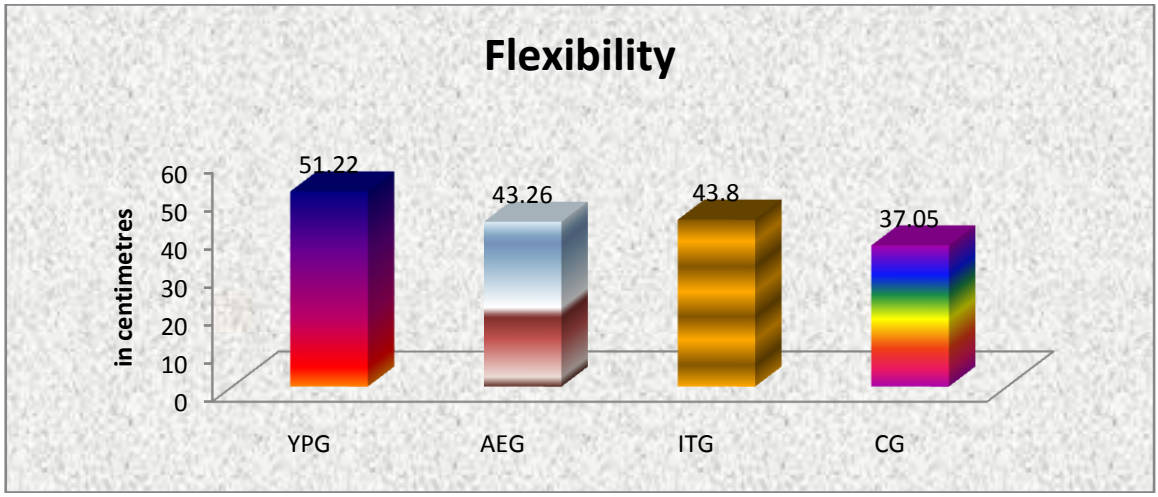

Table IV. The Scheffe's Test for the Differences between the Adjusted Post Test Means on Flexibility

Adjusted Post-Test Means				Mean Difference	Confidence Interval
YPG	AEG	ITG	CG		
51.22	43.26	---	---	7.96*	2.03
51.22	---	43.80	---	7.42*	
51.22	---	---	37.05	14.17*	
---	43.26	43.80	---	0.54	
---	43.26	---	37.05	6.21*	
---	---	43.80	37.05	6.75*	

**** Significant at 0.05 level of confidence***

Table IV shows the post hoc analysis obtained on adjusted post test means. The mean difference required for the confidential interval to be significant was 2.03. It was observed that the yogic practices group significantly increased flexibility better than the aerobic exercises, interval training and control group. The aerobic exercises group significantly increased flexibility better than the control group. The interval training group significantly increased flexibility better than the control group. Hence the aerobic exercises group and interval group produced similar effect on flexibility.

Conclusion

1. The significant mean difference does not exist among the experimental groups in the pre test on cardio respiratory endurance and flexibility.
2. In testing post test mean difference among the experimental groups statistically significant on variables of cardio respiratory endurance and flexibility. In testing the post adjusted mean among the experimental groups also predicts the above result.
3. In comparing the effect the YPG showed better performance on flexibility.
4. In comparing the effect the AEG and ITG produced similar effect on both the variables.

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