



## EFFECTS OF AEROBIC, ANAEROBIC AND COMBINED TRAINING ON SELECTED PHYSICAL AND PHYSIOLOGICAL VARIABLES OF MALE BOXERS

### INTRODUCTION

In the present time, people see the need and are conscious of looking good, feeling good and wanting to live longer. All facts and findings scientifically prove that the best way to achieve this is by regular exercise and fitness regimes. Just like any other activity, getting started is the main issue as today our lives have become so mechanical that there is very little physical exercise in what we do. Not all jobs require physical exertion. Our life has become mechanical, which depend a lot on machines rather than our muscles or body. To add to this we at large have become observers with the old and the young pursuing activities that only take a toll on their lives bringing in issues of high blood pressure, diabetes, cardiac arrest etc. This is on a very high scale. One can curtail this with preventive medicines as per statistics, so it is advisable not to wait till the doctors advise you to. Everyone must get active now and take precautions.

There are many types of training that is given in Boxing for good results. For Boxing anaerobic training is given more and stressed upon. Aerobic training is less on the other hand. Yoga has never been given to Boxers in their training routine. In fact training in Boxing and Yoga have never been given together to a Boxer. It is generally felt that they both have no relation. Boxing is an attacking and physically assaulting activity whereas Yoga is a peaceful and calm activity.

Boxing and Yoga are both two very distinctive and different forms of activity. Boxing demands a lot of physical stress; it is defensive, powerful and rigorous. Yoga on the other hand is less stressful, peaceful and simple to a certain extent. Thus Boxing and Yoga are seen as two very different activities. Yet if we combine the two of them we can create a very effective and result oriented regime or routine for the body. In any activity or game if the mind is under control, at peace and focused, the outcome of the activity or game is result oriented or 100%. By doing Yoga you can gain full control of the mind and body. Thus if Yoga is combined and incorporated in the training of Boxing the result would be good and to the maximum.

During the college education of the researcher, he had the opportunity to take part in both the activities of Yoga, Boxing and gained tremendously from both. Thus for a long time he has thinking of introducing and teaching Yoga during the process of training in Boxing. A Boxer needs to keep his mind at peace. When doing so it is seen that the outcome is always good. For the betterment of the mind and body Yoga is very effective and result oriented.

Thus in the researcher study here in he explored and studied the effects of rhythmic Yoga. He also explored what are the effects of Yoga in Boxing and aerobic training. How aerobic training effects Boxing. How rhythmic Yoga effects Boxing? What are the effects of regularly doing rhythmic yoga with boxing and what are the effects of aerobic training with rhythmic yoga? What are the effects of combining rhythmic Yoga and aerobic training? What would be the most effective and right way for a Boxer to train? To come to a constructive and effective conclusion and also to clear all relevant possibilities and his keen interest in this topic he selected this study.

This kind of research and study is very rare in the field of boxing and never done in Gujarat. Also no research or study has been done on Boxers aerobic and anaerobic exercises with rhythmic yoga. There is no such study or no such training given. That is why he took this topic to study and research. Boxing players with aerobic training, with rhythmic yoga, with anaerobic training and with a mixture of both. He wanted to know and understand the effects of this and have explored that here. He felt that for all the boxers and trainers this study will be very useful, helpful and informative.

### OBJECT OF THE STUDY

The reason and purpose of the study is to find out the effects of aerobic, anaerobic and combined training on selected physical and physiological variables of the male Boxers.

### SELECTION OF SUBJECTS

To technically attain and get full information of the study, 100 male boxers were chosen from Gujarat University and Gujarat Technological University, Gujarat. They were students who participated in the Inter-College level competitions during the year 2015-16. These students were mainly of the age group 17 to 28 years. There was no specific criteria to select these students but were selected at random and were all residents of Gujarat State. They were randomly divided into four groups, each group having 25 subjects. The experiment was done for 12 weeks.

### SHOWING THE VARIABLES, TESTS / TOOLS AND THE UNITS OF MEASUREMENT

TYPE OF VARIABLE	VARIABLE	TESTS/ EQUIPMENTS	UNITS OF MEASUREMENT
Physiological Variables	1. Resting heart rate	Digital heart rate measuring machine	Beats per minute
	2. Breath holding time	Nose clip	Seconds
	3. Vital capacity	Spiro meter	Milliliters
	4. Cardiovascular endurance	Cooper's test	Distance in meters
	5. Systolic Blood Pressure 6. Diastolic Blood Pressure	Digital BP measuring machine	Systolic and Diastolic pressure
Physical Variables	7. Speed	50 Mtrs run	Seconds
	8. Agility	Shuttle run	Seconds
	9. Muscular endurance	Sit ups	Numbers
	10. Arm explosive power	Medicine ball throw	Distance in meters
	11. Leg Explosive Power	Standing	Distance in

		Broad Jump	meters
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## **AEROBIC, ANAEROBIC AND COMBINED TRAINING PROGRAMMES**

A lot of sufficient orientation on aerobic training with rhythmic yoga, anaerobic and combined training was performed. For the individual physical education programme investigators, experts and boxing coaches of each boxer acted as trainers. The training programme for each experimental group was six days in a week – Monday to Saturday and Sunday was given as a rest day and this lasted for 12 weeks.

- Group-1 This group did only aerobic training along with rhythmic yoga
- Group-2 This group did only anaerobic training,
- Group-3 This group did aerobic and anaerobic combined training
- Group-4 Control group.

A schedule was created under the supervision of the investigator and the subjects were made to undergo their respective programmers. The group consisted of 25 boxers each. A workout session for 45 to 60 minutes approximately for each experiment group which included warming up and warming down exercises were done during the training period. Calisthenics and stretching for ten minutes of warm up and warm down for each group during the training sessions is given. A training regimen of aerobic and anaerobic sessions is given to the boxer's.

## **STATISTICAL TECHNIQUE**

Analysis of covariance (ANCOVA) will be computed to find out the important and main effects of aerobic, anaerobic and combined training on the selected physical and physiological variables. (Clarke and Clarke, 1972) will be used for the data collection of aerobic, anaerobic and combined training. Control groups will be set up during the pre-tests and post-tests separately for each variable. It will also define, as four groups were used, which of the paired men differed at the 0.5 levels of significance. LSD post hock test will be used to understand and determine this whenever the F ratio will be significant.

## **RESULTS OF THE STUDY**

Obtained 'F' ratio of Pre-test mean for Resting Heart Rate test of all groups is 0.977 is not significant at 0.05 levels (2.680). The obtained 'F' ratio of post-test means of all groups is 6.371 which is significant at 0.05 level and is greater than the required 'F' value of 2.680 and F ratio of adjusted post-test mean of all groups is 54.14 which is greater than the required F-value of 2.680 and hence it is accepted. This shows the difference between adjusted means of three experimental and one control group, Combined group has improved by 2.844, Aerobic group by 1.938 and anaerobic group by 0.98. 12 week of compensation Training given to all three groups out which training given to combined group shows much improvement.

Obtained 'F' ratio of Pre-test mean for Breath holding time test of all groups is 0.449 is not significant at 0.05 levels (2.680). The obtained 'F' ratio of post-test means of all groups is 9.847 which is significant at 0.05 level and is greater than the required 'F' value of 2.680 and F ratio of adjusted post-test mean of all groups is 96.76 which is greater than the required F-value of 2.680 and hence it is accepted. This shows the difference between adjusted means of three experimental and one control group, Combined group has improved by 6.0207, Aerobic group by 3.5724 and anaerobic group by 3.2285. 12 week of compensation Training given to all three groups out which training given to combined group shows much improvement.

Obtained 'F' ratio of Pre-test mean for Vital capacity test of all groups is 1.733 is not significant at 0.05 levels (2.680). The obtained 'F' ratio of post-test means of all groups is 13.43 which is significant at 0.05 level and is greater than the required 'F' value of 2.680 and F ratio of adjusted post-test mean of all groups is 59.65 which is greater than the required F-value of 2.680 and hence it is accepted. This shows the

difference between adjusted means of three experimental and one control group, Combined group has improved by 116.24, anaerobic group by 48.588 and Aerobic group by 37.882. 12 week of compensation Training given to all three groups out which training given to combined group shows much improvement.

Obtained 'F' ratio of Pre-test mean for Cardiovascular endurance test of all groups is 2.595 is not significant at 0.05 levels (2.680). The obtained 'F' ratio of post-test means of all groups is 39.95 which is significant at 0.05 level and is greater than the required 'F' value of 2.680 and F ratio of adjusted post-test mean of all groups is 339.4 which is greater than the required F-value of 2.680 and hence it is accepted. This shows the difference between adjusted means of three experimental and one control group, Combined group has improved by 531.01, Aerobic group by 483.08 and Anaerobic group by 66.485. 12 week of compensation Training given to all three groups out which training given to combined group shows much improvement.

Obtained 'F' ratio of Pre-test mean for Diastolic Blood Pressure test of all groups is 2.55 is not significant at 0.05 levels (2.680). The obtained 'F' ratio of post-test means of all groups is 0.9 which is not significant at 0.05 levels and is lesser than the required 'F' value of 2.680 and F ratio of adjusted post-test mean of all groups is 0.845 which is lesser than the required F-value of 2.680 and hence it is not accepted and no significant improvement.

Obtained 'F' ratio of Pre-test mean for Systolic Blood Pressure test of all groups is 0.558 is not significant at 0.05 levels (2.680). The obtained 'F' ratio of post-test means of all groups is 0.501 which is not significant at 0.05 levels and is lesser than the required 'F' value of 2.680 and F ratio of adjusted post-test mean of all groups is 0.479 which is lesser than the required F-value of 2.680 and hence it is not accepted and no significant improvement.

Obtained 'F' ratio of Pre-test mean for Speed test of all groups is 2.391 is not significant at 0.05 levels (2.680). The obtained 'F' ratio of post-test means of all groups is 9.79 which is significant at 0.05 level and is greater than the required 'F' value of 2.680 and F ratio of adjusted post-test mean of all groups is 70.22 which is greater than the required F-value of 2.680 and hence it is accepted. This shows the difference between adjusted means of three experimental and one control group, Combined group has improved by 0.420, anaerobic group by 0.412 and Aerobic group by 0.106. 12 week of compensation Training given to all three groups out which training given to combined group shows much improvement.

Obtained 'F' ratio of Pre-test mean for Agility test of all groups is 1.163 is not significant at 0.05 levels (2.680). The obtained 'F' ratio of post-test means of all groups is 3.014 which is significant at 0.05 level and is greater than the required 'F' value of 2.680 and F ratio of adjusted post-test mean of all groups is 102.1 which is greater than the required F-value of 2.680 and hence it is accepted. This shows the difference between adjusted means of three experimental and one control group, Anaerobic group has improved by 0.454, Combined group by 0.331 and Aerobic group by 0.09. 12 week of compensation Training given to all three groups out which training given to Anaerobic group shows much improvement.

Obtained 'F' ratio of Pre-test mean for Muscular Endurance test of all groups is 2.349 is not significant at 0.05 levels (2.680). The obtained 'F' ratio of post-test means of all groups is 20.808 which is significant at 0.05 level and is greater than the required 'F' value of 2.680 and F ratio of adjusted post-test mean of all groups is 163.3 which is greater than the required F-value of 2.680 and hence it is accepted. This shows the difference between adjusted means of three experimental and one control group, Combined group has improved by 8.154, Anaerobic group by 7.7787 and Aerobic group by 6.8377. 12 week of compensation Training given to all three groups out which training given to combined group shows much improvement.

Obtained 'F' ratio of Pre-test mean for Arm Explosive Power test of all groups is 1.189 is not significant at 0.05 levels (2.680). The obtained 'F' ratio of post-test means of all groups is 15.809 which is significant at 0.05 level and is greater than the required 'F' value of 2.680 and F ratio of adjusted post-test mean of all groups is 22.623 which is greater than the required F-value of 2.680 and hence it is accepted. This shows the difference between adjusted means of three experimental and one control group, Anaerobic group has improved by 0.7831, Aerobic group by 0.7578 and Combined group by 0.4936. 12 week of compensation Training given to all three groups out of which training given to Anaerobic group shows much improvement.

Obtained 'F' ratio of Pre-test mean for Leg Explosive Power test of all groups is 0.663 is not significant at 0.05 levels (2.680). The obtained 'F' ratio of post-test means of all groups is 5.067 which is significant at 0.05 level and is greater than the required 'F' value of 2.680 and F ratio of adjusted post-test mean of all groups is 17.95 which is greater than the required F-value of 2.680 and hence it is accepted. This shows the difference between adjusted means of three experimental and one control group, Combined group has improved by 0.2526, Anaerobic group by 0.1353 and Aerobic group by 0.076. 12 week of compensation Training given to all three groups out of which training given to combined group shows much improvement.

## CONCLUSIONS

Within the limitations and delimitations of this study, the following conclusions were drawn from this study:

- I. In comparison to control group all experimental group (Aerobic, Anaerobic and combined Group) of Resting Heart Rate shows significant difference out of which combined group shows more improvement of the Boxing Player.
- II. In comparison to control group all experimental group (Aerobic, Anaerobic and combined Group) of Breath Holding Time shows significant difference out of which combined group shows more improvement of the Boxing Player.
- III. In comparison to control group all experimental group (Aerobic, Anaerobic and combined Group) of Vital Capacity shows significant difference out of which combined group shows more improvement of the Boxing Player.
- IV. In comparison to control group all experimental group (Aerobic, Anaerobic and combined Group) of Cardiovascular Endurance shows significant difference out of which combined group shows more improvement of the Boxing Player.
- V. In comparison to control group all experimental group (Aerobic, Anaerobic and combined Group) of Diastolic Blood Pressure shows no significant difference out of which combined group shows more improvement of the Boxing Player.
- VI. In comparison to control group all experimental group (Aerobic, Anaerobic and combined Group) of Systolic Blood Pressure shows no significant difference out of which combined group shows more improvement of the Boxing Player.
- VII. In comparison to control group all experimental group (Aerobic, Anaerobic and combined Group) of Speed shows significant difference out of which combined group shows more improvement of the Boxing Player.

- VIII.** In comparison to control group all experimental group (Aerobic, Anaerobic and combined Group) of Agility shows significant difference out which Anaerobic group shows more improvement of the Boxing Player.
- IX.** In comparison to control group all experimental group (Aerobic, Anaerobic and combined Group) of Muscular Endurance shows significant difference out which combined group shows more improvement of the Boxing Player.
- X.** In comparison to control group all experimental group (Aerobic, Anaerobic and combined Group) of Arm Explosive Power shows significant difference out which Anaerobic group shows more improvement of the Boxing Player.
- XI.** In comparison to control group all experimental group (Aerobic, Anaerobic and combined Group) of Leg Explosive Power shows significant difference out which combined group shows more improvement of the Boxing Player.

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**Dr. Chetan B. Shiyaniya**  
 Director Sports and Physical Education  
 JG College of Commerce  
 Ahmedabad

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