



Effect of Selected Yogic, Aerobic Exercises and Combined Yogic and Aerobic Practices on Resting Pulse Rate

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ABSTRACT

Physical exercise is an activity in which every human being engages to one degree or another, during the course of his or her life. It is the at most importance to know the physiological and psychological mechanisms that sustain and act as the basis of everyone response to exercise. In the course of physical exertion of coordinated and compensatory adjustments take place throughout the body, which involves the circulatory, respiratory, muscular, nervous and metabolic functions.

Resting pulse rate is a person's pulse rate at rest. The average resting pulse beats per minute. The best time to find out resting pulse rate is in the morning, after a good night's sleep and before get out of bed. It usually rises with age and generally lowers in physically fit people. It is used to determine one's training target pulse rate. The pulse rate adapts to changes in the body's need for oxygen, such as during exercise or sleep.

The purpose of this study is to find out the effect of Yogic, Aerobic exercises and combined yogic and aerobic practices on Resting Pulse Rate of High School Boys. For this randomly 160 School Boys were selected from Govt- High School, S.G.Halli, Bangalore-560079. The test was conducted with the help of Pulse Monitor and Digital watch. Further they were divided in to four groups with 40 subjects in each group, such as yogic group, aerobic group, combined (yogic and aerobic) practice group and control group. Pre-test was conducted before the training. After six weeks of training all the subjects were re-tested to collect post-test data to determine the cause and effect of training. Hence the difference between mean of four groups in the pre-test had to be taken into account during the analysis of the post-test difference between the mean. This was achieved by the application of the analysis of co-variance, where the final mean were adjusted for difference in the initial means and the adjusted means were tested for significance. When the adjusted post-test means were significant at 0.05 levels, the Scheffe's post-hoc test was administered to find out the paired means significant difference. The study proved that resting heart rate was significantly reduced in combined (yogic and aerobic) practice group when compared to other groups.

Keywords :

Introduction:

Lack of physical activity is a major cause for many diseases and disability. Moreover people from all walks of life can understand routine physical activities which protect against a range of diseases caused by sedentary life style. Well designed physical activities can effect on health of the students by decreasing respiratory, digestive, nerves and cardiovascular problems. Hence well organized and properly administered physical education programmes for school children are very essential for physical, physiological and psychological development.

Physical activity engaged in as a child can encourage fitness throughout the lifespan. Educational programmes within the schools should make accessible to all children the opportunity to exercise at a level that is conducive for lifelong health. School counsellors and physical educationists can have an impact on curriculum reforms by collaboratively investing in multi intervention programmes that encompass the psycho physiological spectrum of children within the schools.

Yoga is balanced action of the body, awareness of breath and steadiness of mind. Yoga strengthens the body by toning muscles longer and leaner due to stretching and keeps body stronger and more flexible. Yoga can be practiced vigorously to increase heart rate, it can also be practiced in a way that reduces the heart rate and lowers blood pressure. Bending, stretching and twisting the body massage and soothe the internal organs aiding digestion and elimination. The hormones are brought into greater balance due to the toning of the endocrine system. The respiratory system is strengthened,

nervous system is soothed and stress relieved. In fact, all the systems of the body are affected by practicing yoga. Regular practice of yoga helps to lead active and healthy life. At the end of yoga practice the body is more relaxed and energized.

Aerobic dance can best be defined as continuous movement exercise, locomotor movement and dance steps performed to music. Aerobic dance provides an opportunity for people of widely different levels of physical ability to participate together with musical accompaniment engaging in exercise and skills which have been choreographed according to the needs of the individual. These activities vary from simple movements like free hand exercise to slightly and coordinated movements like twisting, jumping, dancing etc. Aerobics affords each participant the benefits of all components of fitness, including development of circulatory, respiratory, cardiovascular and fat metabolism. A regular aerobic dance programme can lay the foundation for an invigorated, enriched and healthy life.

Aerobic dance work out can be divided into four phases, warm up, skill review, aerobic and cool down. Each phase has its own purpose without which the work out is incomplete. Each phase of programme is necessary if aerobic dance is to provide the desired benefit.

The resting pulse rate is a significant and easy to measure indicator on how fit you are. Athletes and active sportsmen tend to have a lower resting pulse rate than average, because of an increased heart and lung volume. They often have pulse rates of about 32-45 beat per minute, while normal people stay between 60-80 beats per minute.

The easiest way of finding resting pulse rate is using a heart rate monitor. It can also be measured manually by palpating certain points on the body where an artery is close to surface. Most common points are: radial artery (wrist), carotid artery (neck), femoral artery (groin), brachial artery (elbow). To measure the heart rate use index and middle finger of one hand and place it on measuring point and count the heart beats per minute. It can also take shorter time span (from 10 seconds on) and multiply up to one minute.

The best time to measure resting pulse rate is in the morning just before leaving the bed. Several factors can be responsible for a higher resting heart rate, age, sex (men are lower usually), under training (lack of training), overtraining (too much training), some drugs/medication, genetics, stress, anxiety, caffeine, smoking and excitement

Some people simply have a higher/lower resting heart rate that cannot be attributed to any specific cause. Many scientific studies have shown that a resting pulse rate really isn't an effective way of measuring the health of a person although

they say anything above about 84 beats per minute is erring on dangerous.

Methodology:

- For this study 160 subjects were selected randomly and divided in to yogic group, aerobic group, combined (yogic and aerobic) practice group and control group.
- The age of the subjects is between 14 to 15 years.
- Before training pre-test were conducted for all the subjects.
- The experimental group were underwent yogic, aerobic and combined (yogic and aerobic) exercise training every day morning (Except Sunday) for a duration of one hour and a period of six weeks.
- The control group did not undergo any training.
- After completion of six weeks training, all the subjects were tested to collect post-test data to determine the cause and effect of training on resting pulse rate.

The list of exercises and training schedule for yogic, aerobic and combined (yogic and aerobic) practice group are given in details in table A.B.

Table – A

THE TRAINING SCHEDULE FOR SELECTED YOGIC EXERCISES

List of Asanas	week	Training Load	Repetitions
Suryanamaskara: Standing posture: Thadasana, Arda chakrasana, Trikonasana, Vriksasana, Parshava konasana, Uthanasana, Veerabardrasana. Sitting posture: Padmasana, Parvathasana, Ushtrasana, Janusirasana, Vajrasana, Prone Posture: Bhujangasana, Dhanurasana, Shalabhasana, , Ushtrasana Supine Posture: Sarvangasana, Hal asana, Mastyasana, Chakrasana, Jatara pariverthnasana Pranayama: Bramari, Omkar (A.U.M) Relax With Shavasana	1	Medium	1
	2	Considerable	2
	3	Optimum	3
	4	Optimum	3
	5	Considerable	2
	6	Sub maximum	2
	7	Sub maximum	2
	8	Medium	1

Table - B

LIST OF SELECTED AEROBIC EXERCISES AND TRAINING SCHEDULE

WARM UP ROUTINE		
Movement	Repetitions	Counts
ISOLATIONS		
Neck isolation	8	4 each
Shoulder shrugs	8	4 each
Shoulder circle	4	4 each
Reach stretch	8 times alternative right and left	2 each
Active warm up		
March in place	8	1 each
3 walks and a hop	4 times forward 4 backward	1 each
Grapevine and clip jazz square	4 alternative right and left	4 each

STATIC STRETCHES

Lateral stretch	2 alternating left and right	8 each
Across the body stretch	Alternative left and right	8 each
Chest stretch	2times	8 each
Calf stretch	1 right and left	8 each
Hamstring stretch	1 right and left	8 each
Quadriceps stretch	1 right and left	8 each

AEROBIC DANCE ROUTINE

Steps	Repetitions	Counts
Cross over jumping jacks	8 alternative right and left	2 each (16)
Jump and clap	4	2 each (16)

Run and tap	4	4 in combinations (16)
Jump- kick pattern	4 alternative right and left	2 each
Jump lungs sideways with arm punches	4 alternative right and left	2 each
3 runs and pivot	2	4 in combinations
Repeat jump lunge	4 alternative right and left	2 each
Repeat 3 runs and pivot	2	4 in combinations
Scissors jumping jacks	4	2 each
Run and jump-clap forward and backward	1	8 in combinations
Repeat scissors jacks	4	2 each
Turning walk and clap	2 right and left	4 each
Jump and clap	4	2 each
Repeat jump and clap	2 right and left	2 each
Slide forward	4	2 each
Walk forward and backward roll	8	1 each
Slide alternative right and left	4	2 each
Walk backward shoulder roll	8	1 each
Repeat steps 1 to 4	4	1 each

Warming up and cool down: The aerobic training programme was starts with a minimum five minutes of warming up with a variety of exercises and at the end of each day training a systematic cool down exercises was followed.

Administration of Test:

Purpose: To measure the resting pulse rate.

Equipment: Pulse Monitor and Digital watch.

Procedure: The resting pulse rate of the subjects was monitored by the pulse monitor. Before taking pulse rate, the subjects were asked to lay supine position on the floor and relax. The resting pulse was taken in the early morning and recorded in a sitting position. The researcher with the help of physician fixed the pulse monitor on the wrist of the subjects and placed in front of the chest, nearer to the heart after that the start button was put on, the monitor shows the pulse rate for full one minute of the subjects which is recorded by the researcher.

Scoring: The total number of resting pulse per minute was recorded as the score

STILL PICTURES OF MEASURING RESTING PULSE RATE



Analysis of Data and Result:

- Descriptive statistics like mean, F-value were computed.
- Graphical representation of mean in pre-test, post-test and adjusted (for pre-test) were done using multiple bar plots.
- Analysis of Covariance (ANCOVA) statistical technique was used to find out significant difference in mean among four (three experimental and one control) group.
- To tease out the source of significant difference, if any in the previous step, the Scheffe's post-hoc test was carried out.

The difference between mean of four groups in the pre-test had to be taken into account during the analysis of the post-test difference between the mean. The F- ratio obtained by analysis of variance and analysis of co-variance needed 4.41 for significant at 0.05 level. This was achieved by the significant difference between the paired adjusted means were tested by computing the confidence interval value, by utilizing Scheffe's post-hoc test, in which the obtained mean difference value needed to be greater than the Scheffe's confidence interval value for significant.

The following tables and figures illustrate the statistical results.

Table-1
COMPUTATION OF ANALYSIS OF COVARIANCE FOR RESTING PULSE RATE AMONG FOUR GROUPS

(Scores in Seconds)

Groups	Yogic	Aerobic	Combined	Control	Sum of Squares	df	Mean Squares	F-value
Pre-Test Mean	71.93	71.55	72.25	72.60	24.17 511.78	3 156	8.06 3.28	2.46
Post-Test Mean	71.40	71.63	70.90	73.05	102.02 182.48	3 156	34.01 1.17	29.07*
Adjusted Post-Test	71.43	71.72	70.89	72.96	192.93 167.60	3 155	30.97 1.08	28.65*
Mean gain	0.53	0.08	1.35	0.45	-	-	-	-

F (3,155) = 2.66 and F (3,156) = 2.66.*Significant

Table-1 shows the analysed data on Resting Pulse Rate; the pre-test mean of RPR score is 71.93 in yogic group, 71.55 in aerobic group, 72.25 in combined (yogic and aerobic) practice group and 72.60 in control group. As the obtained F-ratio 0.75 was lesser than the table F- ratio 2.66, the pre-test is significant at 0.05 level of confidence for the degree of freedom 3 and 156.

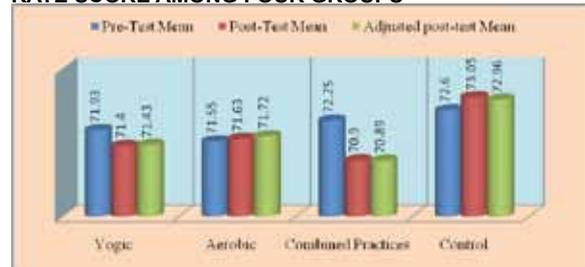
The post-test mean of RPR score is 71.40 in yogic group, 71.63 in aerobic group, 70.90 in combined (yogic and aerobic) practice group and 73.05 in control group. As the obtained F-ratio 8.25 was greater than the table F-ratio 2.66, the post-test is significant at 0.05 level of confidence for the degree of freedom 3 and 156.

The adjusted post-test mean of RPR score is 71.43 in yogic group, 71.72 in aerobic exercise group, 70.89 in combined (yogic and aerobic) practice group and 72.96 in control group. As the obtained F-ratio 28.63 was greater than the table F-ratio 2.66, the post-test is significant at 0.05 level of confidence

for the degree of freedom 3 and 156.

Figure – 1

MULTIPLE BAR PLOT FOR MEANS OF RESTING PULSE RATE SCORE AMONG FOUR GROUPS



The mean scores in the table -2 are represented graphically in the multiple bar plot figure -1. The multiple bar plot denotes

that there is a decrease in adjusted (for pre-test) post-test mean of Resting pulse Rate in combined (yogic and aerobic) practice group when compared with yogic, aerobic and control group. It also denotes a slender increase in the mean of Resting pulse Rate in control group.

The mean gain of yogic, aerobic, combined (yogic and aerobic) practice group and control group is 0.53, 0.08, 1.35 and 0.45 respectively. Scheffe's post hoc test is resorted to find out the significance of adjusted final mean difference among the four groups. The results are as shown in the table - 2.

Table-2

POST HOC TEST ADJUSTED FINAL MEAN DIFFERENCE ON RESTING PULSE RATE BETWEEN FOUR GROUPS

Yogic Group	Aerobic Group	Combined Group	Control Group	M.D	C.I
71.43	71.73	-	-	0.30	0.66
71.43	-	70.87	-	0.56	0.66*
71.43	-	-	72.96	1.53	0.66*
-	71.73	70.87	-	0.86	0.66*
-	71.73	-	72.96	1.23	0.66*
-	-	70.87	72.96	2.09	0.66*

* indicates Significant

The mean difference between experimental group yogic and aerobic, yogic and combined (yogic and aerobic) practice group, yogic and control group, aerobic and combined (yogic and aerobic) practice group, aerobic and control group, combined (yogic and aerobic) practice group and control group is 0.30, 0.56, 1.53, 0.86, 1.23, and 2.09 respectively. The mean difference 0.30, 0.56, is less than the confident interval value

of 0.66 in yogic and aerobic group, yogic and combined (yogic and aerobic) practice group is not significant.

The mean difference 1.53, 0.86, 1.23 and 2.09 is higher than the confident interval value of 0.66 in yogic and combined (yogic and aerobic) practice group, aerobic and combined (yogic and aerobic) practice group, aerobic and control group, combined (yogic and aerobic) practice and control group is significant. Hence the paired mean difference is not significant at 0.05 level of confidence with degree of freedom 3 and 155.

Discussion of findings

The results are clearly indicated that, after the six weeks of yogic and aerobic training, the level of resting pulse rate is decreased by combined (yogic and aerobic) practice group than the yogic, aerobic and control group. Yogic activities help to develop harmony between mind, body and the spirit. And also helps in exercising the tendons and **ligaments**, this improves the rigidity in our body and makes more flexible. Yoga also helps in maintaining blood pressure and ensuring optimum supply of blood to various parts of the body. It helps to enhance the cardiovascular efficiency of our body and also helps in improving neuromuscular coordination. After a yogic activities session the subjects feel rejuvenated and they look at the world in a completely different perspective. Yogasan and pranayama practices are slow and rhythmic activity that relaxes the whole body and more utilization of oxygen during the practice will certainly effect on cardio-respiratory system. Aerobic is a continuous physical exercise activity with sufficient intake of oxygen by working group of muscles which balances usage of energy during the workout. It also strengthens and enlarges the heart muscle to improve its pumping efficiency. Hence there is a significant decrease in resting pulse rate of combined (yogic and aerobic) practice group.

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