



## COMPARATIVE STUDY OF EFFECT OF THREE DIFFERENT REGIMES OF AEROBIC EXERCISE ON RESTING HEART RATE

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### ABSTRACT:

**Purpose of Research:** A strong and healthy heart built by the regular exercises. But as we all know people have less time to do all the exercises to because of their busy life style. The specificity of exercises at times help us train in the activity in such a way that all the benefits of training comes specifically during similar exercises only and not in other exercises which are dependent upon the same system. So this is an effort to found which exercise is best one in the gaining a lower resting heart rate. Result: In the comparative analysis between three groups using ANOVA, it shows that all the regimes are almost equally effective in improving resting heart rate by pulse measuring. Conclusion: Aerobic exercise is an important factor to reduce the indexes of cardiovascular and all causes morbid-mortality. Aerobic exercise improves the physical and mental well-being of people, increase venous return and systolic volume. It improves the oxygen consumption in body and decrease waist hip ratio and body fat percentage of human being.

### KEYWORDS:

**AEROBIC EXERCISE, REGIME, RESTING HEART RATE.**

Health is a word often associated with good fitness<sup>1</sup>. A sedentary lifestyle poses a threat to individuals' health because it can lead to an increase or progression in the risk of hypertension, obesity, muscle weakness, postural defect, diabetes and coronary heart disease (CHD) in middle-aged people<sup>2</sup>. To decrease this risk some form of physical exercise is very important. Regular physical activity is one of the best ways of reducing illness and increasing wellness in the society (Akdur et al., 2007)<sup>4</sup>. One form of physical exercise is aerobic exercise. Aerobic exercise is any physical exercise that intends to improve the efficacy of the cardiovascular system in absorbing and transporting oxygen<sup>1</sup>. Aerobic exercise includes jogging, cycling and stepping. A regular participation in aerobic exercise program, as in other endurance exercise increases the capacity of cardiovascular system<sup>6</sup>. Cardio-respiratory fitness is increased by exercise training, regardless of age, gender, race, and initial fitness level<sup>8</sup>. These cardiovascular changes are produced by a complex set of central and peripheral mechanisms operating at multiple levels--e.g., structural, metabolic, and regulatory<sup>9</sup>. Aerobic exercise has its positive effect in decrease in hypertension (Hagberg, Montain, Martin, et al.1989) and health improvement in the case of other illness<sup>11</sup>. One of the most frequently and extensively analyzed functional parameter of cardiovascular system is the heart rate.

The execution of regular exercise in daily life plays a role for maintaining health and fitness and becomes the prevention and treatment geriatric diseases<sup>12</sup>. Exercise, in itself, tones muscle and further, the energy associated with exercise also help promote weight loss<sup>13</sup>. Heart rate is a unit of measurement for the number of heart beats per minute. For a normal adult, the resting heart rate ranges from 60-100 BPM, while an experienced athlete has a

resting heart rate close to 40 BPM (University of Florida, Recreational Sports, 2012)<sup>19</sup>. During exercise, the heart works harder by pumping more blood to deliver more oxygen to the rest of the body's muscles. Exercise-conditioned heart rates generally range from 60% to 85% of maximum<sup>22</sup>.

The current recommendation for all healthy adults aged 18 to 65 years old is to engage in moderate-intensity exercise for a minimum of 30 min on five days each week, or vigorous-intensity exercise for a minimum of 20 min on three days each week<sup>35</sup>.

So the Need of the study is to found which exercise is best one in the gaining a lower resting heart rate.

### METHODOLOGY

It was a comparative study. Individuals with less parasympathetic modulation of the heart i.e. there with higher resting heart rate and need to be higher from increasing cardiovascular reserve were the targeted population. A total of 60 were taken through random sampling using lottery method. Normal Females of 18-26 years with 70bpm & above were included in the study.

A total of 60 subjects were divided into three groups (n=20). Group A: stepping group, Group B: cycling group and Group C: running group. For taking pre exercise reading resting heart rate was measured with the help of stop watch after rest of 15 minutes by the subject. By two methods:

- 1) Manually by palpating radial pulse for 60 seconds.
- 2) Mechanically by Pulse-oxymeter for 60 seconds.

After completing the pre reading of subjects, aerobic exercises was performed by subjects for 2 weeks on

alternate days. Exercise prescription is based upon the frequency, intensity, and duration of training, the mode of activity, and the initial level of fitness. Within this framework, the total volume of training becomes an important reference for improving fitness. After completion of protocol resting heart rate of all subjects were recorded again and data is analyzed.

**RESULT**

**BASIC CHARACTERISTICS OF GROUPS (TABLE 4.1, 4.2 & 4.3)**

	MEAN ± SD	T- VALUE	P VALUE
PRE RESTING HEART RATE GROUP A	77.15± 2.518	5.934	0.000
POST RESTING HEART RATE GROUP A	73.40± 2.817		
PRE RESTING HEART RATE GROUP B	76.15± 3.265	7.080	0.000
POST RESTING HEART RATE GROUP B	72.00± 2.361		
PRE RESTING HEART RATE GROUP C	76.95± 3.316	4.702	0.00
POST RESTING HEART RATE GROUP C	73.80± 2.802		

**TABLE 4.1- PAIRED T- TEST WITHIN THE THREE GROUPS A, B & C**

P> 0.05 (Non- Significant)

P< 0.05 (Significant)

Comparison of Pre & Post values done within the group (A, B & C) by applying paired t test

The t value for group A was 5.934 (P<0.05). The result for the group A was significant.

The t value for group B was 7.080 (P<0.05) show significant result. The t value for Group C was 4.702 (P<0.05) also show significant result.

So comparison of pre & post values within the groups (A, B & C) shows significant result.

	F VALUE	P VALUE
PRE BETWEEN GROUPS WITHIN GROUPS TOTAL	0.006	0.552
POST BETWEEN GROUPS WITHIN GROUPS TOTAL	2.508	0.090

**TABLE 4.2: ONE WAY ANOVA OF THE PRE & POST VALUES OF VARIABLES BETWEEN THE GROUPS A,**

**B & C**

P>0.05 Non- Significant

P<0.05 Significant

One way ANOVA was done between pre & post values for the variables within the group A, B & C for the change within the variables.

The F value pre for three groups was 0.006 (P>0.05) & F value post for three groups was 2.508 (P>0.05).

It shows no significance in any of the variables.

DEPENDENT VARIABLE	GROUP	MEAN DIFF	SEM	P VALUE
PRE	GROUP A VS GROUP B	1.000	0.966	0.558
	GROUP B VS GROUP C	-0.800	0.966	0.687
	GROUP C VS GROUP A	-0.200	0.966	0.997
POST	GROUP A VS GROUP B	1.400	0.843	0.230
	GROUP B VS GROUP C	-1.800	0.843	0.092
	GROUP C VS GROUP A	0.400	0.843	0.884

**TABLE: 4.3. POST HOC ANALYSIS BETWEEN THE GROUPS**

Post HOC analysis was done within the variables to check the mean difference between pre & post readings.

The mean difference in all variables was non- significant which shows that there was no significant difference within the variables.

Result on the basis of description of tables given above showing result of paired t test to determine the significant difference within the Groups (A, B & C).

One way ANOVA of mean scores of the pre & post values of variables & Post HOC analysis of within groups (A, B & C) show no significant difference within the variables.

The result of study demonstrates that all the regimes are almost equally effective in improving Resting Heart Rate.

**DISSCUSSION**

Regular physical activity leads to significant changes in terms of increased health-related fitness, and can reduce

risk factors for developing a range of disabling medical condition which occur in inactive people<sup>3</sup>. In general, exercise is beneficial for health and physical fitness, while a sedentary lifestyle has a negative effect on a person's well-being<sup>2</sup>. The essence of physiological adaptation of organism is acquisition of such functionality of organism, which distinguished for increased tolerance to physical load, bigger quantity of power and improved regulative mechanisms. The morphological and functional changes, occurring during the adaptation to physical load, greatly depend on the character of exercise. Regular participation in aerobic exercise as well as in other exercises developing endurance improves the cardiovascular system capacity. The cardiovascular system supply inside the system plays a major role and under-standing of its processes is important analysis of organism adaptation.

One of the most frequently and extensively analyzed functional parameters of cardiovascular system is the Heart Rate. The heart rate is increasing from the beginning of physical load. Increasing the intensity of exercise the heart rate is growing upright till reaches its maximal meaning<sup>6</sup>.

The magnitude of improvement varied based on training volume, type of training program, mode of activity, and baseline fitness level<sup>7</sup>.

In the comparative analysis between three groups using ANOVA, it shows that all the regimes are almost equally effective in improving resting heart rate by pulse measuring.

As the post HOC analysis showed no significant difference in the three.

## CONCLUSION

The result of study concluded that there is temporary change in resting heart rate after two weeks training of three different regimes of aerobic exercise i.e. stepping, cycling and running exercises, but none of the three regimes i.e. stepping, cycling and running exercises was significantly better than the other two in the effect on resting heart rate.

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