International Journal of Physical Education and Sports
www.phyedusports.in
Volume: 8, Issue: 08, Pages: 05-08, Year: 2023
Impact Factor: 3.125 (RIF)3.61 (IJI)
ISSN- 2456-2963

Comparative Effect of Flexible Physical Fitness Exercises on Resting Heart Rate of Different Age Groups

Dr. Rajesh Kumar[1]

[1]Assistant Professor, Rajiv Gandhi Govt. College for Women, Bhiwani, Haryana, India.

Received Jul 10, 2023; Accepted Jul 17, 2023; Published Aug 01, 2023

Abstract

The purpose of the study was to investigate which type of training intensity (Low, Medium, & High) was most effective for improving resting heart rate of 12 weeks physical fitness exercises programme for female children age groups of 10-12years and 13-15years. Sixty subjects were randomly selected for this research work from Govt. schools of Chandigarh,U.T. In both the age group of 10-12 years and 13-15 years, four groups A, B, C and D was made of 15 subjects each. Group A (Low Intensity), Group B (Medium Intensity) & Group C (High intensity) acted as Experimental groups, who had participated in 12 weeks physical fitness exercise programme. Whereas other fifteen subjects followed their usual programme and acted as Control Group D. To determine the characteristics of Resting Heart Rate before and after 12 weeks of training at different intensity, mean and standard deviation was used. To compare adjusted post test means of experimental groups and control group in relation to Resting Heart Rate of 10-12 years &13-15years female subjects, ANCOVA was used. The level of significance was set at 0.05. There was significance difference found in Resting Heart Rate in both the age groups. So, It was concluded that if exercises proposed in the present study performed at medium intensity i.e. 60-65% would be most suitable for improving Resting Heart Rate of 10-12 & 13-15 years of female.

Key Words: Physical Fitness, Resting Heart Rate, Intensity.

1. Introduction:

Physical activity levels are decreasing among young people in countries around the world. This decline is largely due to increasingly common sedentary ways of life. For example fewer children walk or cycle to school and excessive time is devoted to watching television, playing computer games and other sedentary activities. Physical inactivity may lead to coronary heart disease via increased adiposity, reduced lean body mass, reduced cardiovascular fitness, raised blood pressure, reduced glucose tolerance, lowered insulin sensitivity, and adverse lipid profile. Especially Girls' physical education activity participation is generally less frequent and of a lower intensity than that of boys (McKenzie *et al*, 2000). There is need to encourage girls to get involved in sports and physical activity at early age. Health benefits can be derived simply from becoming more physically active, but the greatest benefits come from engaging in planned and structured exercise. Exercise has a number of effects that benefit the heart and circulation Regular exercise (walking, running, cycling, etc.) stimulates changes in the cardiovascular system, lungs, and muscle cells which improve work capacity. Added health benefits include a decrease in resting heart rate and a lowering of maximal blood pressure with submaximal exercise.

Sallis et al (1986) found that resting heart rate correlated well with vigorous exercise level and, in a longitudinal study, that resting heart rate was the only physiological variable that changed significantly in subjects who gave up vigorous exercise compared with those who maintained it. It's actually one of the most important indicators of overall wellness. And it's one of the most effective elements of any fitness program. The heart rate not only controls our body but also the efficiency of exercise. By monitoring heart rate more benefits can be gain from any physical activity.

2. Materials and Method:

Sixty subjects were randomly selected for this research work from Govt. schools of Chandigarh,U.T. In both the age group of 10-12 years and 13-15 years, four groups A, B, C and D was made of 15 subjects each. Group A (Low Intensity), Group B (Medium Intensity) & Group C (High intensity) acted as Experimental groups, who had participated in 12 weeks physical fitness exercise programme. Whereas other fifteen subjects followed their usual programme and acted as Control Group D. Automatic Digital Blood Pressure Monitor was used to measure Resting Heart Rate. Score were recorded number of beats per minute.

A pilot study was conducted with 30 students for four weeks time duration to set the intensity and physical fitness exercise programme for both age groups (10-12 years & 13-15 years).

2.1 Exercises Intensity –Different level of Intensity was set by the target heart rate zone and was calculated by the **Karvonen** method.

LOW INTENSITY	• 55-60% of max. Heart rate • Repetition of exercises - 8-10 (main part)
MEDIUM INTENSITY	• 60-65% of max. Heart rate • Repetition of exercises– 12-15 (main part)
HIGH INTENSITY	• 65-70% of max. Heart rate • Repetition of exercises– 15-20 (main part)

2.2 Statistical Procedure:

To investigate the effect of eight weeks yogic training on resting pulse rate. Analysis of Co Variance was used at. 05 level of significance. For the purpose of the analysis of data Software SPSS for Windows (11.5 Version) and Microsoft Excel was used.

3. Results and Discussion:

The findings pertaining to three experimental groups and control group mean and standard deviations were computed and data pertaining to that have been presented in this table.

Mean and Standard Deviation of different Intensities (Low, Medium, High and Control) in relation to Resting Heart Rate (*beat/minute*)

Age (years)	Test	Low Intensity		Medium Intensity		High Intensity		Control Group	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
10-12	Pre	81.06	6.08	80.73	3.19	80.60	2.66	82.26	4.80
	Post	78.33	4.67	76.33	3.46	78.06	2.71	82.26	5.01
13-15	Pre	80.33	5.55	80.93	3.01	80.60	2.66	82.26	4.80
	Post	77.93	5.29	76.53	3.42	77.93	2.82	82.26	5.01

The above table reveals that in case of 10-12 years girls, the mean Resting Heart Rate of pre test was more or less similar in all the three intensities but during post test, Resting Heart Rate increases in the entire intensities group. Low intensity and High intensity were almost similarly down by 78.33 beat/minute and 78.06 beat/minute respectively. However, in case of medium intensity there was decrease of Resting Heart Rate 76.33 beat/minute. Control group showed no effect from pre to post test

Similarly in case of 13-15 years the mean Resting Heart Rate of pre test was more or less similar in all the three intensities but during post test of Resting Heart Rate increases in all the intensities group. Low intensity and High intensity were similarly down by77.93 beat/minute. Conversely, in case of medium intensity there was decrease of Resting Heart Rate 76.53 beat/minute. Control group showed no effect from pre to post test.

The table no-1 also reveals that the mean Resting Heart Rate of 10-12 years was better in comparison to 13-15 years in all the three intensities.

To observe the difference among experimental groups and control group the analysis of variance and co-variance was adopted and data pertaining to these have been presented in this table

Analysis of Co-Variance of the Means of Three Experimental Groups and the Control Group - Resting Heart Rate *(b/min)*

	Groups								
	Exp. I	**Exp. II**	**Exp. III**	**Control Group**		**Sum of Squares**	**Df**	**Means sum of square**	**F-ratio**
Pre-test Means	81.06	80.73	80.60	82.26	**A**	25.93	3	8.64	0.446
					W	1084.40	56	19.36	
Post-test Means	78.33	76.33	78.06	82.26	**A**	282.71	3	94.23	5.696*
					W	926.53	56	16.54	
Adjusted post test means	78.42	76.69	78.54	81.35	**A**	164.48	3	54.82	16.690*
					W	180.68	55	3.28	

* Significant at 0.05 level of significance

N	=	60
Exp. I	=	Low Intensity Group
Exp. II	=	Medium Intensity Group
Exp. III	=	High Intensity Group
A	=	Among Means variance
W	=	With in Group variance
F	=	Ratio needed for significance at 0.05 level of significance = df (3, 56)= 2.76, df (3, 55) = 2.78

The analysis of co-variance was insignificant in case of pre-test means from which it is clear that the pre-test mean does not differ significantly and that the random assignment of subjects to all the groups was quite successful. The post-test means of all the four groups yielded a F-ratio of 5.696 which was found significant at 0.05 level of confidence. The difference between the adjusted post test means was found insignificant as the obtained F-ratio was 16.690 The F-ratio needed for significance at 0.05 level of confidence was 2.78.

Post Hoc Comparison of Adjusted Means Scores of Resting Heart Rate *(ml/kg/min)* in Different Groups

Low Intensity	Medium Intensity	High Intensity	Control Group	Mean Difference	Critical Difference
78.42	76.69			1.73*	
78.42		78.54		0.12	
78.42			81.35	2.93*	
	76.69	78.54		1.84*	
	76.69		81.35	4.66*	1.323
		78.54	81.35	2.81*	

* Significant at 0.05 level of significance

The above table shows that significant difference was found between Low Intensity and Medium intensity, Low Intensity and Control Group, Medium Intensity and High Intensity, Medium Intensity and Control Group, and High Intensity and Control Group as the obtained Mean Difference was greater than the C.D. at 0.05 level of significance.

Whereas no significance was found Low Intensity and High Intensity as the obtained M.D. was less than C.D.

Finally, as the Adjusted mean of Medium Intensity was greater than the other Intensities, it may useful for improve Resting Heart Rate.

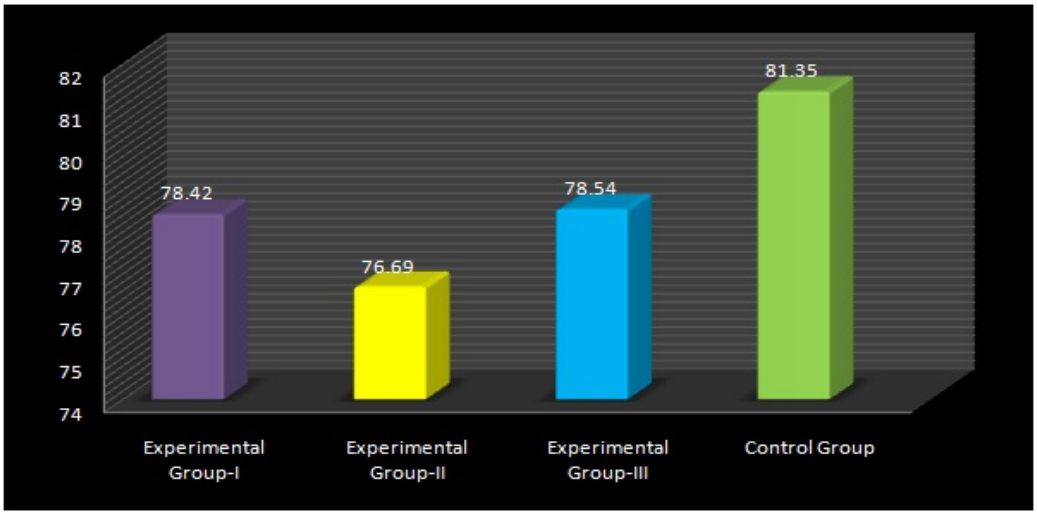

Figure: 1 Graphical representation of Adjusted mean of Resting Heart Rate

4. Discussion:

All the experimental treatments found to be effective in bring out change in Resting Heart Rate of 10-12 years female subjects. Lower Intensity group found to be superior then High Intensity group and Control group in relation to Resting Heart Rate of 10-12 years female subjects. Medium Intensity group found to be superior then Low Intensity, High Intensity group and Control group in relation to Resting Heart Rate of 10-12 years female subjects. High Intensity group found to be superior then Control group in relation to Resting Heart Rate of 10-12 years female subjects.All the experimental treatment found to be effective in bring out change in Resting Heart Rate of 13-15 years female subjects. Lower Intensity group found to be superior then High Intensity group and Control group in relation to Resting Heart Rate of 13-15 years female subjects. Medium Intensity group found to be superior then Low Intensity, High Intensity group and Control group in relation to Resting Heart Rate of 13-15 years female subjects. High Intensity group found to be superior then Control group in relation to Resting Heart Rate of 13-15 years female subjects.

5. Conclusion:

It was concluded that if exercises proposed in the present study performed at medium intensity i.e. 60-65% would be most suitable for improving Resting Heart Rate of 10-12 & 13-15 years of female.

6. References:

[1]. Jishu Chakaborthy, Abstracts from International Conference on Health, Sport and Physical Fitness, Need for an Integrated Approach, (New York January 16-18, 1995).

[2]. Edline. Gorden, and Golanty. Eric, (2009) Physical Activity for Health and Well Being. *Health and Wellness*. 10th ed. p.163.

[3]. *McKenzie, T. L., Marshall, S. J., Sallis, J. F. and Conway, T. L. (*2000*) Student activity levels, lesson context, and teacher behavior during middle school physical education. Research Quarterly for Exercise and Sport,* 71*,* P.249–*259.*

[4]. Thomos. J.K. and Nelson. J.K., Research *Method in Physical Activity*, 4th Ed. Human Kinetics, p.321.

[5]. Sallis, J. F., Haskell, W. L., Wood, P. W., Fortmann, S. P. and Vranizan, K. M.,1986 "Vigorous physical activity and cardiovascular risk factors in young adults". *Journal of Chronical Disease. 39: 115-120.*

[6]. Uppal, A.K., (1990), *Physical Fitness – How to Develop*. India.,p.4.

[7]. Wilmore, J. H, & Costill, D. L. (2004). *Physiology of Sport and Exercise*. 3rd. ed. Champaign, Illinois: Human Kinetics. p. 522-521.

[8]. World Health Organization. "*Obesity and physical activity, technical report series"*. WHO. 2009.

Dr. Rajesh Kumar, Assistant Professor, Rajiv Gandhi Govt. College for Women, Bhiwani, Haryana, India.