

Effect of Floor Aerobic Exercise and Resistance Training on Heart Rate of School Students

Ishvarbhai Arjunbhai Ganasva

Ph.D. Scholar
Shri Govind Guru University,
Godhra

Email- ishwarganasava@gmail.com

Dr. Ishvarbhai V. Damor

Asst. Professor
Shri P. N. Pandya Arts College,
Lunavada

Abstract: The purpose of this research study was to study the effect of floor aerobic exercise and resistance training on the heart rate of school students. This research study was limited to the students of Godhra Secondary School. A total of 90 students were selected as subjects in this research study. In which 30 students were kept in the floor aerobic exercise group, 30 students in the resistance group and 30 students in the control group. In this research study, 14 to 16 year old brothers were randomly selected. They were divided into three groups and trained for 12 weeks. In the measurement standard, heart rate was measured by Micro Plus Digital Machine and the differences between the means were tested at the 0.05 level by applying the 'F' ratio (ANCOVA) on the data obtained from the two experimental groups and one control group. The results were as follows. A twelve (12) week floor aerobic training and resistance training program of five methods showed significant improvements in the heart rate of selected subjects.

Key Words: Floor Aerobic Exercise and Resistance Training on Heart Rate.

1. INTRODUCTION :

In the modern era, rapid technological advancement, urbanization, and sedentary lifestyles have significantly reduced the level of physical activity among school-going children. Increased screen time, academic pressure, and reduced outdoor play opportunities have contributed to declining physical fitness and rising health concerns such as obesity, cardiovascular disorders, and poor muscular development. Among various physiological parameters, **heart rate** is considered one of the most important indicators of cardiovascular efficiency and overall health status. It reflects the functional capacity of the heart and its ability to respond to physical stress. Therefore, maintaining an optimal heart rate through regular physical activity is essential for school students to ensure proper growth, development, and long-term health.

Physical education programs in schools play a vital role in promoting health-related fitness. Among the different forms of exercise, **floor aerobic exercise** and **resistance training** have gained considerable attention due to their effectiveness in improving cardiovascular fitness and muscular strength. Floor aerobic exercise consists of rhythmic, continuous movements performed to music, involving large muscle groups. It enhances oxygen consumption, increases heart efficiency, and improves endurance. On the other hand, resistance training involves exercises that work against an external force such as body weight, resistance bands, or weights, aiming to improve muscular strength, endurance, and overall physical fitness.

Heart rate is defined as the number of times the heart beats per minute (bpm). It varies depending on factors such as age, fitness level, activity intensity, and emotional state. In children and adolescents, regular physical activity has been shown to positively influence resting heart rate, exercise heart rate, and recovery heart rate. A lower resting heart rate generally indicates better cardiovascular efficiency, as the heart can pump more blood with fewer beats. Studies have demonstrated that aerobic exercise significantly reduces resting heart rate and improves cardiovascular performance by enhancing oxygen delivery and utilization in the body.

Floor aerobic exercise, being a form of cardiovascular training, plays a crucial role in regulating heart rate among school students. During aerobic activity, the heart rate increases to supply more oxygen to the working muscles. Over time, consistent participation in such activities strengthens the heart muscle, allowing it to pump blood more efficiently. Research indicates that structured aerobic programs conducted over several weeks can significantly improve cardiorespiratory fitness and reduce heart rate during rest and submaximal exercise. This adaptation is particularly

beneficial for school students, as it enhances their stamina, reduces fatigue, and improves their overall physical performance.

In addition to aerobic exercise, resistance training also contributes to cardiovascular health, although its primary focus is on muscular strength and endurance. Resistance exercises stimulate muscle fibers, improve neuromuscular coordination, and enhance metabolic efficiency. While traditionally considered less effective for heart rate improvement compared to aerobic exercise, recent studies have shown that resistance training can positively influence heart rate variability and cardiovascular function. Combined aerobic and resistance training programs have been found to produce greater improvements in heart health compared to either form of exercise alone.

For school students, the integration of floor aerobic exercise and resistance training provides a comprehensive approach to physical fitness. Aerobic exercise improves cardiovascular endurance and heart efficiency, while resistance training enhances muscular strength and supports overall physical development. This combination not only improves physical health but also contributes to psychological well-being, including reduced stress, improved mood, and increased self-confidence.

Another important aspect of heart rate in school students is exercise heart rate response and recovery rate. Exercise heart rate refers to the increase in heart rate during physical activity, whereas recovery heart rate indicates how quickly the heart returns to its normal state after exercise. A faster recovery rate is a sign of better cardiovascular fitness. Regular participation in aerobic and resistance exercises has been shown to improve recovery heart rate, indicating enhanced autonomic control and cardiovascular efficiency.

Furthermore, childhood and adolescence are critical periods for developing lifelong health habits. Engaging students in structured physical activities such as floor aerobics and resistance training helps instill discipline, improves physical literacy, and promotes a healthy lifestyle. Studies have also highlighted that exercise interventions in school-aged children lead to improvements in body composition, fitness levels, and cardiovascular health markers. These benefits emphasize the importance of incorporating such exercise programs into school curricula.

Floor aerobic exercise is particularly suitable for school environments due to its simplicity, minimal equipment requirement, and adaptability to different fitness levels. It can be performed in groups, making it enjoyable and motivating for students. The rhythmic nature of aerobics, combined with music, enhances participation and reduces monotony. During aerobic sessions, heart rate typically reaches moderate to vigorous intensity levels, which are essential for improving cardiovascular endurance. Studies measuring heart rate during aerobic classes have shown that participants maintain heart rates within the target training zone, indicating the effectiveness of such exercises in improving heart function.

2. The Purpose of the Study :

This research study examined the effects of floor aerobic exercise and resistance training on the heart rate of school students.

3. Selection of the Subject :

This research study was limited to the students of Godhra Secondary School. In this research study, a total of 90 students were selected as subjects. In which 30 students were placed in the floor aerobic exercise group, 30 students in the resistance group and 30 students in the control group. In this research study, 14 to 16 year old brothers were randomly selected. Who were divided into three groups and trained for 12 weeks.

Criterion Measurement :

Sl.	Variable	Test	Measurement
1	Heart Rate	Micro Plus Digital	Number

Deign of the Study

Three groups were randomly formed from the 90 selected subjects. In which 30 subjects were given floor aerobic training, 30 subjects were given resistance training, 30 subjects were given experimental training. While 30 subjects were kept free from experimental training as a control group. Thus, a total of four groups were formed.

Two experimental groups were assigned to a 12-week floor aerobic and resistance training program, which was performed every morning from 6 to 7 a.m. All three experimental groups were given a day off, Sunday.

Data were collected through pre-test and post-test of selected running parameters of subjects of both groups before the start of the experimental training and after the completion of the 12-week floor aerobic and obstacle running training.

Statistical Procedure :

The significance of the differences between the means was tested at the 0.05 level by applying the 'F' ratio (ANCOVA) on the data obtained from the two experimental groups and one control group.

4. Result of the Study :

Table - 1
Covariance analysis of heart rate test performance of two experimental and one control groups

Test	Group			Covariance analysis				
	Floor Aerobic Training	Resistance Training	Controlled	Sum of squares (SS)		Degree of Freedom (df)	Mean sum of square (MSS)	F
Per test Mean	78.067	78.933	77.433	A	34.022	2	17.011	0.644
				W	2299.100	87	26.426	
Post test Mean	71.833	71.567	76.133	A	394.156	2	197.078	5.540*
				W	3095.000	87	35.575	
Adjusted Mean	71.904	70.853	76.776	A	592.151	2	296.076	20.948*
				W	1215.511	86	14.134	

*Significance Level at 0.05 (2,87) = 3.101 & (2,86) = 3.103.

In the above table - 1, the 'F' ratio of the pre-test medians of the heart rate test performance was found to be 0.644. Comparing it with the table value (3.101) it was not found to be significant at the 0.05 level. The 'F' ratio of the final test medians of the three groups was found to be 5.540. Comparing it with the table value (3.101) it was found to be significant at the 0.05 level. Therefore, the training provided proved to have significantly improved the performance of the subjects. In addition, the 'F' ratio of the improved medians was found to be 20.948. Comparing it with the table value (3.103) it was found to be significant at the 0.05 level.

Table - 2
Table showing the critical difference between the means of two experimental and one control group in heart rate test performance.

Median			Mean Difference	Critical Difference
Floor Aerobic Training	Resistance Training	Controlled		
71.904	70.853		1.050	1.647
71.904		76.776	4.873*	
	70.853	76.776	5.923*	

*Significance level at 0.05 level

As per Table - 2, the improvement was seen at a very significant (5.923) level in the obstacle training group. Then the floor aerobic training group showed an improvement at a level of (4.873). The training given to the obstacle training group was more significant in the experimental fitness of the floor aerobic training group and the obstacle training group. In comparison to the control group, a significant effect of experimental fitness was seen in both the experimental groups, the floor aerobic training group and the obstacle training group. A significant effect of experimental fitness was not seen between the two experimental groups. But the effect of experimental fitness was seen on both the experimental groups compared to the control group.

5. Conclusion

A twelve (12) week floor aerobic training and resistance training program of five methods showed significant improvement in the heart rate of selected subjects.

References :

1. Verma, Prakash J., A Textbook on Sports Statistics, Gwalior: Venus Publication, 2000.
2. Kang, S. J., Kim, E. H., & Ko, K. J. Effects of aerobic exercise on resting heart rate and physical fitness. Journal of Physical Therapy Science, 2016.
3. Masroor, S., et al. Heart rate variability following combined aerobic and resistance training. Indian Heart Journal, 2018.
4. Davis, C. L., et al. Effects of aerobic exercise on cardiovascular health in children. Randomized Controlled Trial, 2019.
5. Santos Villafaina, et al. Exercise and heart-rate variability in children. Sustainability Journal, 2021.