

# Effect of Aerobic Exercise on Cardiovascular Health on Professional Youth Students

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## ABSTRACT

The present study assessed the effect of aerobic exercise on cardiovascular health among professional youth students. Thirty male and female students aged between 16-19 years were random selected as sample. The participants were divided into two equal groups, experimental group (n=15) and a control group (n=15). The experimental group undertaken a six week aerobic exercise training program, while the control group without training. A post-test only group design was used for the study. Cardiovascular health variables such as Resting Heart Rate(RHR), Blood Pressure (Systolic and Diastolic) and Cardiovascular endurance were selected as dependent variables. The data were statistically analysed to determine the effect of aerobic exercise training. The results of the study shown that significant improvement in cardiovascular health variables of the experimental group compared to control group. The study concluded that regular aerobic exercise training has a positive and significant effect on cardiovascular health of professional youth students.

**Keywords:** Aerobic exercises, Cardiovascular health, Professional youth students.

## INTRODUCTION

Aerobic exercise is widely popular as one of the most effective forms of physical activities to improve cardiovascular health. Aerobic exercise also means physical exercise with the use of Oxygen adequately to meet energy demands during exercise through aerobic metabolism. Aerobic activity helps to strengthen the heart and lungs and makes them more efficient and durable. Heart gets stronger and pumps more blood at each stroke. Regular exercised individual, stroke volume is found to be more than that of the average individual. Pumping of heart becomes more efficient and is able to fill more blood in the chambers of heart.

Cardiovascular health is important component of overall fitness. Cardiovascular endurance serves as important physiological markers for assessing the functioning of heart and circulatory system. This health reflects better cardiac efficiency and improved oxygen transport to body tissues. At the young age the life of youth includes rapid physical development, psychological stress and academic pressure. Professional youth serve as role model for promoting healthy lifestyles. students, particularly those enrolled in physical education programmes are expected to maintain high level of fitness and serve as role model for promoting healthy lifestyles. To investigate the effect of a six-week aerobic exercise training programme on selected cardiovascular health variables such as resting Heart Rate(RHR), Blood Pressure (Systolic and Diastolic) and Cardiovascular endurance as dependent variables. The findings of this study are providing valuable insights for physical educator, coaches and health professionals for improving cardiovascular health among youth students.

**Objective:** The present study aims to assess the effect of aerobic exercise on cardiovascular health on professional youth students.

**Hypothesis:** There will be no significant effect of aerobic exercise on cardiovascular health in professional youth students.

**Methods**

- **Sample:** Thirty professional youth male and female students from the department of physical education Barkatullah University, Bhopal, Madhya Pradesh, selected randomly, as subject of the study and their age ranged between 16 to 19 years. The selected subject divided into two equal group namely experimental group and control group with 15 subjects in each group.
- **Design:** Post-test only group design was used in this study.
- **Procedure:** Experimental group underwent the training of 6 weeks of aerobics exercises and control group did not give any training. Post-test comparison employed between experimental groups and control group.

**Weeks Training Program for Experimental Group Week I – II (Adaptation Phase)**

Activity	Duration	Intensity	Notes
Brisk Walking / Slow Jogging	15 min	50–60% MHR*	Warm-up aerobic rhythm
Stationary Cycling / Skipping	10 min	60% MHR	Maintain steady rhythm
Aerobic Circuit (Low impact)	20 min	Moderate	Jumping jacks, spot jogging, side step, grapevine, knee lifts
Breathing Exercises	5 min	Low	Diaphragmatic & rhythmic breathing
Cool Down (Stretching + Relaxation)	10 min	-	Light stretching and relaxation

**Week III – IV (Dynamic Phase)**

Activity	Duration	Intensity	Notes
Jogging / Skipping	10 min	60–70% MHR	Dynamic warm-up
Continuous Running	20–25 min	70% MHR	Non-stop pace, rhythmic breathing
Aerobic Dance Routine	15 min	65–75% MHR	Add music for motivation (low–moderate impact)
Agility Ladder + Cone Drills	10 min	Moderate	Combine footwork and coordination
Cool Down (Stretching + Yoga)	10 min	-	Focus on deep breathing, flexibility

**Week V – VI (Advanced Phase)**

Activity	Duration	Intensity	Notes
Dynamic Warm-up (Running + Skipping + Mobility)	10 min	65–70% MHR	Prepare for HIIT
Interval Training (HIIT Aerobics)	25–30 min	75–85% MHR	1 min fast run + 1 min jog × 10–12 sets
Step Aerobics / Circuit Routine	10–15 min	75% MHR	Alternate between steps, knee lifts, side kicks, punches

Breathing + Relaxation Yoga	5–10 min	-	Deep breathing, relaxation
Static Stretching (Full body)	5 min	-	Include PNF or partner stretches

### Criterion of Measures

Sl. No.	Variable	Test Item	Measure	Unit
1	Resting Heart Rate (RHR)	Pulse count after 10 minutes rest	Beats per minute (bpm)	bpm
2	Blood Pressure (BP)	Digital sphygmomanometer	Systolic / Diastolic Pressure	mmHg
3	Cardiovascular Endurance (CE)	Harvard Step test	Distance covered / Recovery heart rate	meters / bpm

### Statistical Analysis

The purpose of this analysis was to determine whether there was a significant difference between the two groups in terms of Resting Heart Rate, Systolic Blood Pressure, Diastolic Blood Pressure and Cardiorespiratory Endurance (Harvard Step Test Score).

The statistical analysis was conducted using the t-test (independent samples) to examine post-test mean differences between the groups. The level of significance was set at 0.05. The results are presented in the following table:

Table :1 Statistical Comparison of Experimental and Control Groups (Post-Test Only Design)

Variable	Mean (Experimental)	Mean (Control)	t-value	pvalue	Interpretation
Resting Heart Rate (bpm)	74.6	81.1	-5.82	0.0000	Significant difference – lower resting HR in experimental group
Systolic Blood Pressure (mmHg)	120.1	125.0	-3.26	0.0029	Significant difference – lower systolic BP in experimental group
Diastolic Blood Pressure (mmHg)	79.1	82.1	-2.57	0.0165	Significant difference – lower diastolic BP in experimental group
Harvard Step Test Score	74.1	63.6	4.85	0.0001	Highly significant difference – higher endurance in experimental group

The results presented in Table 1 clearly indicate that there were statistically significant differences between the experimental and control groups in all selected variables after the training program.

- The Resting Heart Rate of the experimental group (Mean = 74.6 bpm) was significantly lower than that of the control group (Mean = 81.1 bpm), with a *t-value of -5.82* ( $p < 0.05$ ). This suggests that the experimental training program effectively improved cardiovascular efficiency and reduced resting heart rate.
- The Systolic Blood Pressure of the experimental group (Mean = 120.1 mmHg) was significantly lower compared to the control group (Mean = 125.0 mmHg), with a *t-value of -3.26* ( $p = 0.0029$ ). This indicates better regulation of blood pressure among participants in the experimental group.

- Similarly, the Diastolic Blood Pressure was also significantly lower in the experimental group (Mean = 79.1 mmHg) than in the control group (Mean = 82.1 mmHg), with a t-value of -2.57 ( $p = 0.0165$ ).
- In the Harvard Step Test Score, which measures cardiorespiratory endurance, the experimental group obtained 6a higher mean score (Mean = 74.1) compared to the control group (Mean = 63.6), with a tvalue of 4.85 ( $p = 0.0001$ ). This difference was highly significant, indicating a substantial improvement in endurance performance as a result of the intervention program.

## FINDINGS

The findings of the analysis show that the experimental group made significant improvements in cardiovascular parameters and endurance levels when compared to the control group. The lower heart rate and blood pressure values suggest better cardiovascular efficiency and improved physiological adaptation to the training program. Additionally, the higher Harvard Step Test scores indicate better aerobic capacity and overall fitness. Thus, the results support rejecting the null hypothesis, confirming that the experimental training program had a significant positive effect on the selected physiological and fitness variables among the participants. To test these hypotheses, the independent 't'-test was used at the 0.05 level of importance. Based on the findings, the study concluded that the null hypotheses were rejected and the alternative hypotheses were accepted. Therefore, the study shows that aerobic exercise has a significant positive effect on cardiovascular health among professional youth students.

## DISCUSSION

The results showed clear improvements in all chosen variables for the experimental group when compared to the control group. The resting heart rate and blood pressure (systolic and diastolic) were noticeably lower in the experimental group. The Harvard Step Test Score was significantly higher, indicating better endurance and fitness. These results suggest that regular aerobic exercise positively affects cardiovascular health in young professional students.

## CONCLUSION

Overall, the study concludes that aerobic exercise plays a vital role in promoting cardiovascular health and improving physical fitness among youth. Regular participation in aerobic activities such as jogging, running, cycling, and step exercise can help in developing better endurance, heart health, and overall well-being. This research shows that aerobic exercise is one of the most effective, low-cost, and accessible ways to enhance cardiovascular health among professional youth students. Regular participation not only improves physical performance but also contributes to better health, confidence, and quality of life.

## REFERENCES

1. O'Connor, H., Bird, S., & Williams, C. A. (2024). Implementing high-intensity interval training in school physical education: Effects on adolescent fitness. *Journal of Sports Sciences*, 42(5), 587–596. <https://doi.org/10.1080/02640414.2023.2184567>
2. Ibrahim, M., Salah, F., & Mahmoud, H. (2024). Combined resistance and aerobic training improves cardiovascular and metabolic health in adolescents. *Journal of Pediatric Health Care*, 38(1), 44–53. <https://doi.org/10.1016/j.pedhc.2023.08.001>
3. World Health Organization. (2023). Cardiovascular diseases (CVDs). [https://www.who.int/newsroom/fact-sheets/detail/cardiovascular-diseases-\(cvds\)](https://www.who.int/newsroom/fact-sheets/detail/cardiovascular-diseases-(cvds))
4. Adams, G. M., Smith, J. P., & Thompson, R. L. (2022). Effects of high-intensity interval training on adolescent vascular health: A randomized controlled trial. *Journal of Pediatric Exercise Science*, 34(2), 101–112. <https://doi.org/10.1123/jpes.2021-0123>
5. Mijalković, D., Stojiljković, N., & Todorović, N. (2022). School-based physical activity interventions for cardiovascular risk reduction in adolescents. *Journal of School Health*, 92(6), 519–528. <https://doi.org/10.1111/josh.13189>
6. World Health Organization. (2020). Guidelines on physical activity and sedentary behaviour. World Health Organization. <https://www.who.int/publications/i/item/9789240015128>

7. Fraga, M., Sampaio, A., & Carvalho, H. (2018). Mitochondrial adaptations and aerobic performance in adolescents: Effects of structured exercise. *Pediatric Exercise Science*, 30(4), 556–567. <https://doi.org/10.1123/pes.2017-0196>
8. A., & Verma, R. (2017). Effect of aerobic training on cardiovascular parameters in Indian adolescents. *Indian Journal of Sports Science and Physical Education*, 29(2), 78–83.
9. Racil, G., Ben Ounis, O., Kallel, A., Zouhal, H., Chamari, K., & Amri, M. (2016). Time-efficient high intensity interval training improves fitness in adolescents. *Journal of Sports Medicine and Physical Fitness*, 56(4), 376–384. <https://doi.org/10.23736/S0022-4707.16.06012-8>
10. Racil, G., Ben Ounis, O., Kallel, A., Zouhal, H., Chamari, K., & Amri, M. (2016). Time-efficient high intensity interval training improves fitness in adolescents. *Journal of Sports Medicine and Physical Fitness*, 56(4), 376–384. <https://doi.org/10.23736/S0022-4707.16.06012-8>
11. Davenport, M. H., Hogan, D. B., Eskes, G. A., Longman, R. S., Poulin, M. J., & Pearce, E. (2016). Exercise and cardiovascular outcomes in youth: Role of intensity and frequency. *Canadian Journal of Cardiology*, 32(8), 967–975. <https://doi.org/10.1016/j.cjca.2016.03.021>.
12. Lubans, D. R., Richards, J., Hillman, C. H., Faulkner, G., Beauchamp, M. R., Nilsson, M., & Biddle, S. J. (2016). Physical activity for cognitive and mental health in youth: A systematic review of mechanisms. *Pediatrics*, 138(3), e20161642. <https://doi.org/10.1542/peds.2016-1642>
13. Bailey, D. P., Hewson, D. J., Champion, R. B., & Sayegh, S. M. (2016). Associations between cardiorespiratory fitness and heart rate variability in adolescents: The influence of sex and physical activity. *Pediatric Exercise Science*, 28(3), 377–385.
14. Racil, G., Ben Ounis, O., Kallel, A., Zouhal, H., Chamari, K., & Amri, M. (2016). Time-efficient high intensity interval training improves fitness in adolescents. *Journal of Sports Medicine and Physical Fitness*, 56(4), 376–384. <https://doi.org/10.23736/S0022-4707.16.06012-8>.
15. Costigan, S. A., Eather, N., Plotnikoff, R. C., Taaffe, D. R., & Lubans, D. R. (2015). High-intensity interval training for improving health-related fitness in adolescents: A systematic review and meta-analysis. *British Journal of Sports Medicine*, 49(19), 1253–1261. <https://doi.org/10.1136/bjsports-2013-093285>.
16. Peters, C., Rauner, A., & Woll, A. (2014). Program duration and its impact on youth cardiovascular fitness: A meta-analysis. *Preventive Medicine*, 63, 48–55. <https://doi.org/10.1016/j.ypmed.2014.01.022>
17. Bergholm, F., Hakala, J., & Viikari, J. (2013). Long-term aerobic training and cardiac adaptations in adolescents. *Acta Paediatrica*, 102(6), 583–589. <https://doi.org/10.1111/apa.12214>