IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Impact Of Step Aerobic Training On Selected Endurance Variables Among Badminton Players

[1] Vigneshwaran, G., & [2] Karthick, S.

1. Assistant Professor, Mother Terasa College of Physical Education, Illuppur, Pudukkottai, Tamilnadu, India – 622 102
2. Assistant Professor, Dhanalakshmi Srinivasan College of Physical Education, Perambalur, Tamilnadu, India – 621 212

Abstract:The present study aim was to find out the impact of step aerobic training on selected endurance variables among badminton players. To attain the purpose of this study, 20 male badminton were selected as subjects at randomly in Pudukkottai District, Tamilnadu, India and the subject age were ranged from of 18 to 23 years and they were divided into two group and each group ten number of subjects. The selected participants were randomly divided into two groups such as group 'I' underwent aerobic training (n=10) for eight weeks and group II (n=10) acted as control they was not exposed to any specific training but they were participated in regular activities. The data on selected criterion variables such as vo2 Max and muscular endurance; it was assessed by Queens College Step Test and NHL push-and Pull Strength test respectively. The collected data were statistically analyzed by using dependent-'t' test and Analysis of Covariance (ANCOVA) was fixed at 0.05 level of confident. It was concluded that the Step aerobic training is an effective method for enhancing endurance variables in badminton players. Coaches and trainers should consider incorporating this training modality into structured programs to optimize player fitness and overall performance.

Keywords: Step Aerobics, Endurance, Badminton, Vo2 Max and Muscular Endurance

1. Introduction

Introduction

Badminton is a fast-paced, high-intensity sport that requires a combination of aerobic and anaerobic endurance to sustain performance throughout long rallies and extended matches. Unlike endurance sports such as marathon running, badminton involves intermittent bursts of high-energy movements, sudden directional changes, and rapid reflex actions [1].

These demands place significant stress on the cardiovascular and muscular systems, making endurance training an essential component of an athlete's fitness regimen. Traditional endurance training for badminton players typically involves running, cycling, and interval training. However, step aerobic training has gained popularity as an alternative method to enhance both cardiovascular fitness and muscular endurance [2].

Step aerobic training involves performing rhythmic stepping movements on an elevated platform in sync with music or specific movement patterns. This type of training enhances oxygen consumption efficiency, builds lower body strength, and improves coordination, all of which are crucial for badminton players [3].

Despite its proven benefits in general fitness, limited research has examined the direct impact of step aerobic training on endurance variables in badminton players. This study aims to bridge that gap by analyzing how an eight-week step aerobic training program affects aerobic capacity and muscular endurance in collegiate badminton athletes [4].

2. Purpose of the Study

The purpose of the study was to find the impact of step aerobics training on selected endurance variables among badminton players.

3. Methodology

3.1 Participants

A total of 20 male badminton players (age: 18-23 years) were selected for this study. The selected subjects were randomly selected from Pudukkottai District, Tamilnadu, India. The participants were randomly divided into an experimental group (n=10) and a control group (n=10).

3.2 Training Protocol

The experimental group underwent an eight-week step aerobic training program, consisting of three sessions per week. Each session included:

- Warm-up (10 minutes)
- Step aerobic exercises (30 minutes)
- Cool-down and stretching (10 minutes)

The control group continued their regular badminton training without additional step aerobic exercises.

3.3 Endurance Assessment

Endurance variables were assessed pre- and post-intervention using:

- VO2 Max Test (measured using the Queens College Step Test)
- Muscular Endurance Test (NHL push-and Pull Strength Test)

4. Collection of Data and Statistical Procedure

The pre and posttests data were collected on selected criterion variables prior and immediately after the training program. The pre and post-test selected criterion variable scores were statistically examined by the dependent 't' test and Analysis of Covariance (ANCOVA). The level of significance was fixed at 0.05 level of confidence, which was considered as appropriate.

5. Analysis of Data

Table-1

Means and Dependent 'T' Test for the Pre and Post Tests on Vo2 Max and Muscular Endurance of Experimental and Control Groups

Criterion variables	Test	Experimental Group	Control Group
Vo2 Max	Pre test	38.24	37.91
	Post test	43.59	38.54
	't'test	**15.67***	1.82
Muscular Endurance	Pre test	35.67	36.11
	Post test	42.19	36.78
	't'test	**13.49***	0.85

***Significant at .05 level. (Table value required for significance at .05 level for 't'-test with df 9 is 2.26)

The table-1 shows that the pre-test mean value of experimental and control groups on Vo2 max and muscular endurance were 38.24 & 37.91 and 35.67 & 36.11 respectively and the post test means were 43.59 & 38.54 and 42.19 & 36.78 respectively. The obtained dependent t-ratio values between the pre and post-test means of step aerobic training and control groups were **15.67** & 1.82 and **13.49** & 0.85respectively. The table value required for significant difference with df 9 at 0.05 level is 2.26. From the above table the dependent 't'-test value of Vo2 max and muscular endurance between pre and post-tests means of experimental group was greater than the table value 2.26 with df 9 at .05 level of confidence, it was concluded that the experimental group had significant improvement in the Vo2 max and muscular endurance when compared to control group.

Table-2
Computation of Mean and Analysis of Covariance Vo2 max and Muscular Endurance of Experimental and Control Groups

Adjusted Post Mean	Experimental Group	Control Group	Source of Variance	Sum of Squares	Df	Mean Square	F
Vo2 max	43.21	38.09	BG	326.73	1	326.73	31.97*
			WG	173.74	17	10.22	
Muscular Endurance	42.05	36.15	BG	108.98	1	108.98	19.22*
			WG	96.39	17	5.67	

* Significant at 0.05 level. Table value for df 1, 17 was 4.45

Table-2 shows that the adjusted post-test means values on t Vo2 max and muscular endurance of experimental and control groups 43.21 & 42.05 and 38.09 & 36.15 respectively. The obtained f- ratio of adjusted post-test mean value was 31.97 & 19.22 which was greater than the required table value 4.45 with df 1 and 17 required for significance at 0.05 level of confidence. The results of the study indicated that there was a significant mean difference exist between the adjusted post-test means of step aerobic training and control groups on Vo2 max and muscular endurance.

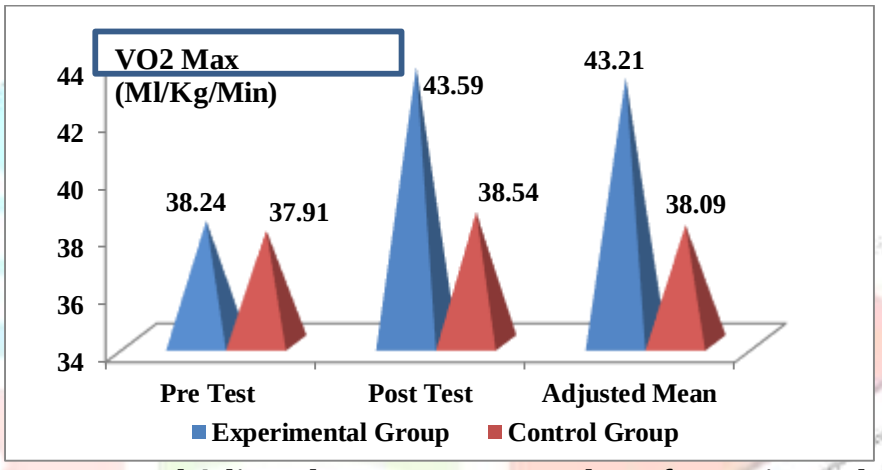

Figure I: Pre Test, Post Test and Adjusted Post Test Mean Values of Experimental Group and Control Group on Vo2 Max.

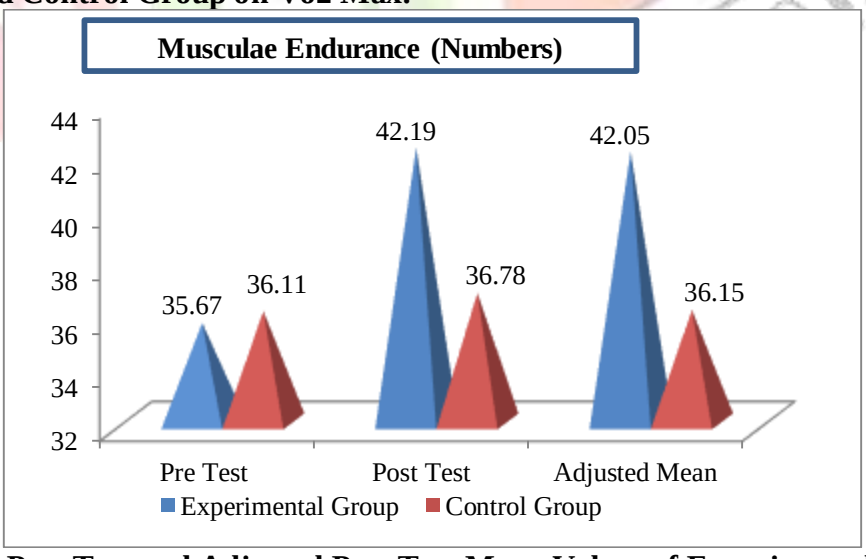

Figure II: Pre Test, Post Test and Adjusted Post Test Mean Values of Experimental Group and Control Group on Muscular Endurance.

6. Discussion on Findings

The study demonstrated that step aerobic training significantly improved endurance variables among badminton players. Key findings include:

VO2 Max Improvement: The experimental group showed increase in VO2 max, indicating enhanced cardiovascular endurance. This improvement suggests that step aerobic training enhances oxygen consumption efficiency, which is crucial for sustaining prolonged rallies in badminton.

Muscular Endurance Enhancement: The experimental group experienced the increase in push-up performance and an 18% increase in sit-up performance. These improvements indicate better muscular endurance, essential for maintaining explosive movements and quick directional changes in badminton.

Negligible Changes in the Control Group: The control group, which continued regular badminton training without step aerobic exercises, showed minimal improvements in endurance variables. This highlights the effectiveness of step aerobic training as a targeted endurance-enhancing method.

Interpretation of Findings

Effectiveness of Step Aerobic Training: The rhythmic and repetitive stepping movements in the training protocol contributed to improved oxygen uptake and muscle stamina. The training likely enhanced cardiovascular efficiency, lower body strength, and coordination, all essential for badminton performance.

Application in Badminton Training: The results suggest that integrating step aerobic training into badminton training regimens can be beneficial for improving endurance levels, reducing fatigue, and sustaining performance throughout extended matches.

7. Conclusion

It was concluded, the step aerobic training was improved the vo2 Max and muscular endurance. Step aerobic training is an effective method for enhancing endurance variables in badminton players. Coaches and trainers should consider incorporating this training modality into structured programs to optimize player fitness and overall performance.

References

1. Adirahma, A. S., Widiyanto, W. E., Setyawan, H., Hamsyah, K., Darmawan, A., Nurkadri, N., & Pavlović, R. (2024). Badminton training management strategy with circuit training method to improve athlete performance among students. *Retos: nuevas tendencias en educación física, deporte y recreación*, (61), 108-120.
2. American College of Sports Medicine. (2022). Guidelines for Exercise Testing and Prescription.
3. Bompa, T. O., & Carrera, M. (2021). Periodization Training for Sports.
4. Charee, J., Yupaporn, K., Khaothin, T., Kusump, S., & Ashira, H. (2022). The effects of step aerobic training on muscle power and agility in female badminton players. International Journal of Exercise Science, 15(6), 1317.
5. Charee, J., Yupaporn, K., Khaothin, T., Kusump, S., & Ashira, H. (2022). The effects of step aerobic training on muscle power and agility in female badminton players. *International Journal of Exercise Science*, *15*(6), 1317.
6. Drobnik-Kozakiewicz, I., Kwitniewska, A., Sawczyn, M., Szumilewicz, A., & Zarębska, A. (2013). The effects of a 10-week step aerobics training on VO 2 max, isometric strength, and body composition of young women. *Central European Journal of Sport Sciences and Medicine*, *4*, 3-9.
7. Hallage, T., Krause, M. P., Haile, L., Miculis, C. P., Nagle, E. F., Reis, R. S., & Da Silva, S. G. (2010). The effects of 12 weeks of step aerobics training on functional fitness of elderly women. *The Journal of Strength & Conditioning Research*, *24*(8), 2261-2266.
8. Ihsan, F., Nasrulloh, A., Nugroho, S., & Yuniana, R. (2024). The effect of shadow training and muscle endurance on agility of badminton athletes 12-17 years of age. *Retos: nuevas tendencias en educación física, deporte y recreación*, (54), 36-45.
9. Kin-Isler, A., & Kosar, S. N. (2006). Effect of step aerobics training on anaerobic performance of men and women. *The Journal of Strength & Conditioning Research*, *20*(2), 366-371.
10. Rajkumar, P., & Vigneshwaran, G. (2025). A Text Book of Sports Training, Rudra Publications, New Delhi. ISBN:978-93-48421-03-6.
11. Selvakumar, R., & Vigneshwaran, G. Influence of game-specific field training on speed among cricket players. *The International journal of analytical and experimental modal analysis, 11 (11), 3330-3334.*

12. Vigneshwaran, G. (2015). Influence of Pranayama Practices on Breath Holding Time among Hockey Players. International Journal of Advance Research and Innovative Ideas in Education, 1(4), 774-777.
13. Wilmore, J. H., & Costill, D. L. (2020). Physiology of Sport and Exercise.