



INFLUENCE OF SPECIFIC YOGIC PRACTICES ON CARDIOVASCULAR ENDURANCE OF COLLEGE STUDENTS

Physical Education & Sports Science

Dr.N Selva Kumar Assistant Director of Sports, AMET University, Chennai.

Dr.N.R.Ramkumar Director of Sports, AMET University, Chennai.

ABSTRACT

The ability to sustain prolonged physical activity is a crucial indicator of cardiovascular health. In recent years, college students have exhibited a decline in cardiovascular endurance due to increasingly sedentary lifestyles and academic demands. Yogic practices, which include physical postures (asanas), controlled breathing techniques (pranayama), and relaxation methods, offer a holistic and non-pharmacological approach to improving cardiovascular function. The present study aimed to examine the influence of selected yogic practices on the cardiovascular endurance of college students. A total of thirty students aged 18 to 25 years were selected and randomly assigned to an experimental group and a control group. The experimental group participated in a structured yoga programme for 60 minutes per session, five days per week, over a period of twelve weeks, while the control group continued their routine daily activities without any intervention. Cardiovascular endurance was assessed using the Cooper 12-minute run test before and after the intervention. The collected data were analysed using descriptive statistics and t-tests at a 0.05 level of significance. The findings revealed a statistically significant improvement in cardiovascular endurance among students who underwent the yoga intervention compared to those in the control group. These results suggest that regular practice of selected yogic techniques effectively enhances cardiovascular endurance and can be beneficially integrated into college health and physical activity programmes.

KEYWORDS

Cardiorespiratory Efficiency, College Students, Structured Yoga Intervention, Cardiovascular Endurance, and Experimental Design.

INTRODUCTION

The heart, lungs, and circulatory system function in coordination to deliver oxygen to the body during sustained physical activity, and their efficient operation is vital for maintaining overall health. When these systems perform optimally, the body is able to meet increased oxygen demands during prolonged exertion, a capability known as cardiovascular endurance. Adequate levels of cardiovascular endurance play a significant role in disease prevention, enhance physical efficiency, and contribute to improved performance in daily activities and academic pursuits.

In recent years, however, college students have demonstrated a noticeable decline in cardiovascular endurance, largely due to increasingly sedentary lifestyles. Extended periods of computer and mobile phone usage, television viewing, and intensive academic workloads have limited opportunities for regular physical activity and participation in sports. Within this context, yogic practices-comprising physical postures (asanas), regulated breathing techniques (pranayama), and relaxation methods-have gained recognition as a holistic, economical, and non-invasive approach to enhancing cardiovascular health. Yoga has been shown to improve respiratory efficiency, regulate autonomic nervous system activity, and optimize oxygen utilization, thereby positively contributing to cardiovascular endurance.

RESEARCH OBJECTIVES:

- To determine the effect of selected yoga techniques on cardiovascular endurance among college students.
- To assess and compare cardiovascular endurance levels of college students before and after the yoga intervention.
- To compare the improvement in cardiovascular endurance between the experimental group and the control group.

RESEARCH HYPOTHESES:

- Selected yoga practices will lead to a statistically significant improvement in cardiovascular endurance among undergraduate students.
- There will be a significant difference in cardiovascular endurance scores of undergraduate students between the pretest and post-test following participation in the yoga practice program.

METHODS

Research Design

The present study employed a quasi-experimental pre-test-post-test control group design to examine the effects of specific yogic practices on cardiovascular endurance among college students. Two groups were assessed before and after the intervention: an experimental group, which participated in a structured yoga program, and a control group, which continued their usual daily routines without any organized physical training

Participants

A total of 30 college students aged 18–25 years were selected from affiliated colleges using a random sampling technique. The participants were randomly assigned to either the experimental group (n = 15) or the control group (n = 15).

Inclusion Criteria

- Students aged between 18 and 25 years
- Apparently healthy individuals
- Not engaged in any structured physical training or yoga program during the previous six months
- Willing to participate and provide informed consent

Intervention Protocol

The experimental group participated in a 12-week structured yogic practice program, while the control group did not receive any intervention. The program was conducted five days per week, with each session lasting 45–60 minutes. To ensure safety, uniformity, and proper supervision, all sessions were conducted in the morning under the guidance of a certified yoga instructor.

Structure of the Yoga Sessions

Each session was designed to be replicable and standardized, comprising three phases:

1. Warm-Up (10 minutes)

- Loosening exercises
- Joint mobilization techniques
- Stretching exercises

2. Core Yogic Practices (30–35 minutes)

Asanas

- Surya Namaskar – enhances aerobic capacity and cardiovascular efficiency
- Tadasana – improves posture and breathing coordination
- Vrikshasana – develops balance and neuromuscular control
- Bhujangasana – promotes thoracic expansion and respiratory efficiency
- Pranayama
- Kapalbhati – stimulates respiratory muscles and optimizes oxygen utilization
- Anulom Vilom – regulates autonomic balance and heart rate
- Bhastrika – enhances lung capacity and cardiovascular response

3. Relaxation Phase (5–10 minutes)

- Shavasana – facilitates mental and physical relaxation, promoting recovery and cardiovascular stabilization

Justification of Yogic Practices

The selected yoga techniques were chosen based on their documented effects on cardiorespiratory efficiency, aerobic endurance, and

autonomic regulation. By integrating dynamic asanas, controlled breathing exercises, and relaxation practices, the intervention aimed to achieve holistic improvement in cardiovascular endurance among college students.

DATA COLLECTION PROCEDURE

The study employed a pre-test intervention post-test design. Baseline measurements of cardiovascular endurance were recorded for both the experimental and control groups prior to the intervention. Following the completion of the 12-week yogic program, post-intervention measurements were collected to assess changes in cardiovascular endurance. All procedures were conducted in accordance with ethical guidelines to ensure participant safety, confidentiality, and voluntary participation. Written informed consent was obtained from all participants before their inclusion in the study.

Cardiovascular endurance - Paired Samples Statistics on Control and Experimental Group					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Control group pre test	1699.3333	15	57.37927	14.81526
	Control group post test	1698.0000	15	57.34607	14.80669
Pair 2	Experimental pre test	1699.3333	15	60.29294	15.56757
	Experimental post test	1770.0000	15	70.50836	18.20518

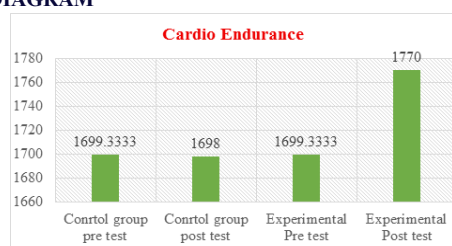
The control group showed a negligible change in cardiovascular endurance, with mean scores of 1699.33 (pre-test) and 1698.00 (post-test) and similar standard deviations (57.38 vs. 57.35), indicating no significant improvement without intervention. In contrast, the experimental group exhibited a marked increase in mean cardiovascular endurance from 1699.33 (pre-test) to 1770.00 (post-test), despite some variability among participants (SD = 60.29 pre-test, 70.51 post-test). These findings suggest that the yogic intervention significantly enhanced cardiovascular endurance, whereas the control group remained largely unchanged.

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Control group pretest - Control group post test	1.3333	12.74288	3.29020	-5.72344	8.39010	.405	14	.691
Pair 2	Experimental pretest - Experimental post test	-70.6667	43.17186	11.14693	-94.57445	-46.75889	-6.340	14	.000

Interpretation of the Results:

Control Group: The mean difference between pre-test and post-test scores was 1.33, with a 95% confidence interval of -5.72 to 8.39. The t-test revealed no statistical significance ($t=0.405$, $df=14$, $p=0.691$), indicating that the control group's cardiovascular endurance did not change significantly. Experimental Group: The mean difference between pre-test and post-test scores was -70.67, with a 95% confidence interval of -94.57 to -46.76. The t-test showed a statistically significant improvement ($t=-6.34$, $df=14$, $p<0.001$), demonstrating that the yoga intervention effectively enhanced cardiovascular endurance. These results indicate that the yoga program led to a significant increase in cardiovascular endurance for the experimental group, while the control group, which did not receive the intervention, showed no significant change.

BAR DIAGRAM



The following bar diagram shows that the experimental group exhibited a statistically significant improvement in endurance after the intervention, highlighting the positive effect of the yoga program, whereas the control group showed no significant change in cardiovascular endurance between the pre-test and post-test.

DISCUSS ON FINDINGS

The combined effects of yoga poses, breathing exercises, and relaxation techniques—all of which are known to enhance oxygen use, cardiorespiratory efficiency, and autonomic regulation—may be responsible for the notable improvements seen in the experimental group. Frequent practice probably improved total endurance capacity, decreased resting heart rate, and increased stroke volume, which resulted in better post-test performance. Overall, the results provide compelling evidence for the research hypothesis that some yoga techniques greatly increase university students' cardiovascular endurance. The study's internal validity is strengthened by the control group's lack of change, which also verifies that the yoga intervention rather than other factors was the cause of the experimental group's observed benefits. These results emphasize the value of incorporating structured yoga programs into physical education and health promotion initiatives for improving cardiovascular fitness in young adults.

CONSULTATION AND FUTURE STUDIES:

The present study revealed that selected yoga practices significantly enhanced cardiovascular endurance among university students. The experimental group demonstrated a statistically significant improvement following the intervention, while the control group showed no noticeable change. These findings support the research hypothesis and confirm the effectiveness of yoga in improving cardiorespiratory efficiency. Yoga appears to be a cost-effective, non-invasive, and practical approach to promoting cardiovascular health among young adults. Future research should incorporate larger and more diverse samples, comparative analyses, and long-term follow-up studies.

REFERENCE:

- Lau, C., Yu, R., & Woo, J. (2015). Effects of a 12-Week Hatha Yoga Intervention on Cardiorespiratory Endurance, Muscular Strength and Endurance, and Flexibility in Hong Kong Chinese Adults: A Controlled Clinical Trial. *Evidence-based complementary and alternative medicine: eCAM*, 2015, 958727.
- Karmur, K. A., Jani, H. A., Vala, N. H., & Bhandari, P. C. (2017). Effect of Yoga on pulmonary function tests. *International Journal of Research in Medical Sciences*, 3(9), 2357–2361.
- Desai N, Somani M, Patel A, Thumar S, Joshi C. (2023). *Secondary Effects of Yoga and Pranayama in Dentistry: A Narrative Review*. J Clin of Diagn Res. 17(8), ZE16-ZE20.
- Rice, V. J. B. (2024). Introduction to the special section on complimentary medicine for work, function and health. *WORK: A Journal of Prevention, Assessment & Rehabilitation*, 78(4), 1157-1159. <https://doi.org/10.3233/WOR-246015> (Original work published 2024)
- Sharma, H., Swetanshu, & Singh, P. (2024). Role of Yoga in Cardiovascular Diseases. *Current problems in cardiology*, 49(1 PtA), 102032. <https://doi.org/10.1016/j.cpcardiol.2023.102032>.
- Manchanda, S. C., & Madan, K. (2014). Yoga and meditation in cardiovascular disease. *Clinical research in cardiology : official journal of the German Cardiac Society*, 103(9), 675–680. <https://doi.org/10.1007/s00392-014-0663-9>.
- Nivethitha, L., Moovenanth, A., & Manjunath, N. K. (2016). Effects of Various Prāṇāyāma on Cardiovascular and Autonomic Variables. *Ancient science of life*, 36(2), 72–77. https://doi.org/10.4103/asl.178_16.
- Verma, S., Hatwal, J., & Batta, A. (2024). Impact of Yoga beyond Physical Training on the Cardiovascular System: An Updated Review. *The journal of Tehran Heart Center*, 19(2), 79–88. <https://doi.org/10.18502/jthc.v19i2.16195>.
- Natarajan D. (2015). Yoga: from cardiovascular benefit to the gates of God. *Indian heart journal*, 67(1), 83–84. <https://doi.org/10.1016/j.ihj.2015.02.018>.
- Prabhakaran, D., & Chandrasekaran, A. M. (2020). Yoga for the prevention of cardiovascular disease. *Nature reviews. Cardiology*, 17(9), 536–537. <https://doi.org/10.1038/s41569-020-0412-x>.