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## Effects of yogic practices and in combination with aerobics training on physical fitness and physiological variables among male college students

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### Abstract

The aim of this study was to investigate the effects of yogic practices in combination with aerobics training on physical fitness and physiological variables among male college students. Sixty individuals from Govt. Engineering College, Thrissur, Kerala, aged between 18 to 22 years, were selected for the study. They were divided into three equal groups (n = 20), two experimental and one control group. The training regimen lasted three days a week for twelve weeks. The selected physical and physiological variables such as variables such as speed, agility, muscular strength & endurance, VO<sub>2</sub> max, systolic blood pressure and diastolic blood pressure were tested before and after the training. Analysis of covariance (ANCOVA) was employed to determine any significant differences among the experimental groups and control group, regarding the selected variables. Additionally, the Scheffe's test was utilized as a post-hoc test due to the involvement of three groups in the study. The findings indicated that both yogic practices with and without aerobics training positively influenced the criterion variables of speed, agility, muscular strength & endurance, VO<sub>2</sub> max, systolic blood pressure and diastolic blood pressure among college male students compared to the control group. However, no significant difference was observed between the training groups themselves.

**Keywords:** Yogic practices, aerobics training, speed, agility, muscular strength & endurance, vo<sub>2</sub> max, systolic blood pressure, diastolic blood pressure and college students

### Introduction

In recent years, there has been a growing interest in exploring alternative methods of physical fitness training beyond conventional gym workouts and sports activities. Yoga, an ancient practice originating from India, has gained significant attention worldwide due to its potential benefits for physical, mental, and spiritual well-being. Concurrently, aerobic exercises have long been recognized for their cardiovascular benefits and contribution to overall fitness levels. The amalgamation of yogic practices and aerobic training presents a promising avenue for enhancing physical fitness and physiological parameters among college-aged individuals. The transition from adolescence to adulthood marks a crucial phase in physical development, where lifestyle habits are established and can significantly impact long-term health outcomes. College students, often faced with academic pressures and sedentary lifestyles, are particularly susceptible to the adverse effects of inadequate physical activity. As such, interventions aimed at improving physical fitness and overall health are of paramount importance in this demographic.

This study aims to investigate the effects of yogic practices, both independently and in conjunction with aerobic training, on selected physical fitness and physiological variables among college male students. By examining the synergistic effects of these two modalities, this research seeks to contribute to the growing body of evidence supporting the efficacy of integrative approaches to fitness and health promotion. Understanding the potential benefits of combining yogic practices with aerobic training holds practical implications for fitness professionals, educators, and health practitioners working with college populations. Moreover, elucidating the physiological mechanisms underlying these interventions can inform tailored exercise prescriptions and optimize outcomes in terms of physical fitness, stress management, and overall well-being.

In this introduction, the scholar will provide an overview of yogic practices, aerobic training, and their respective effects on physical fitness and physiological parameters. Additionally outline the rationale, objectives, and significance of the present study, setting the stage for the subsequent investigation into the impacts of these interventions on college male students' health and fitness outcomes.

### Methods

This research investigates the effects of yogic practices alone and in combination with aerobics training on physical fitness and physiological variables among male college students. Sixty individuals from Govt. Engineering College, Trissur, Kerala, aged between 18 to 22 years. Selected sixty (N=60) subjects were randomly allocated into three groups, each comprising twenty participants. Group I (n = 20) engaged in yogic practices, Group II (n = 20) practiced yogic practices with aerobics training, and Group III (n = 20) served as the control group. The training regimen spanned twelve weeks, with sessions conducted three days per week during morning hours (6.30 am to 8 am). The selected physical fitness

variables such as speed was assessed using the 50 mts dash test, agility was measured using a Illinois agility test, muscular strength & endurance was measured modified sit ups and physiological variables such as VO<sub>2</sub> max was assessed using the queens college step test, systolic blood pressure and diastolic blood pressure was measured using spigmomanometer. Prior to commencing the experiment, all subjects in the yogic practices with and without aerobics training and control groups underwent a pre-test one day before training initiation. Data on selected physical fitness and physiological variables were collected during this pre-test. Following the twelve-week training period, a post-test was conducted one day after training completion to assess any changes in the criterion variables. Analysis of covariance (ANCOVA) was utilized to determine significant differences among the experimental and control groups for each criterion variable, with a confidence level of 0.05 considered appropriate. Given the involvement of three groups, the Scheffe's test was employed as a post-hoc test.

### Results

**Table 1:** Analysis of Covariance on Selected Physical Fitness Variables of Yogic Practices and Yogic Practices with aerobics training and Control Groups

Variable Name	Test	Yoga Practice Group	Yoga Practice with Aerobic Training Group	Control Group	'F' Ratio
Speed	Pre-test Mean $\pm$ S.D	8.32 $\pm$ 0.59	8.28 $\pm$ 0.48	8.33 $\pm$ 0.56	0.07
	Post-test Mean $\pm$ S.D	8.00 $\pm$ 0.50	7.83 $\pm$ 0.43	8.36 $\pm$ 0.63	5.48*
	Adj. Post-test Mean	7.98	7.84	8.33	26.14*
Agility	Pre-test Mean $\pm$ S.D	18.85 $\pm$ 0.62	18.90 $\pm$ 1.05	18.96 $\pm$ 1.21	0.92
	Post-test Mean $\pm$ S.D	18.15 $\pm$ 0.62	17.79 $\pm$ 0.88	18.98 $\pm$ 1.44	10.03*
	Adj. Post-test Mean	18.11	17.69	18.83	50.23*
Muscular Strength & Endurance	Pre-test Mean $\pm$ S.D	29.60 $\pm$ 4.94	28 $\pm$ 4.48	30.45 $\pm$ 5.04	1.55
	Post-test Mean $\pm$ S.D.	34 $\pm$ 3.46	35.30 $\pm$ 4.61	30.40 $\pm$ 3.99	18.10*
	Adj. Post-test Mean	34.11	36.61	29.88	81.81*

\*Significant at 0.05 level of confidence

Table 1 displays the results indicating that pre-test mean 'F' ratio for speed in the yogic practices, yogic practices with aerobics training and control groups was 0.07, which was found to be insignificant at the 0.05 level of confidence. However, the post-test and adjusted post-test mean 'F' ratio value for the experimental groups and the control group was 5.48 and 26.14, respectively, showing significance at the 0.05 level of confidence.

Similarly for agility, pre-test mean 'F' ratio for the yogic practices, yogic practices with aerobics training and control groups was 0.92, which was insignificant at the 0.05 level of confidence. However, the post-test and adjusted post-test

mean 'F' ratio value for the experimental group and the control group was 10.03 and 50.23, respectively, showing significance at the 0.05 level of confidence.

For Muscular Strength & Endurance, pre-test mean 'F' ratio for the yogic practices, yogic practices with aerobics training and control groups was 1.55, which was insignificant at the 0.05 level of confidence. However, the post-test and adjusted post-test mean 'F' ratio value for the experimental groups and the control group was 18.10 and 81.81, respectively, showing significance at the 0.05 level of confidence. To determine which paired means exhibited significant differences among the groups, Scheffé post hoc test was employed.

**Table 2:** Scheffé's Post Hoc Test for the Difference between the Adjusted Post-Test Mean of Speed, Agility and Muscular Strength & Endurance

Adjusted Post-test Mean Difference on Speed				
Yoga Practice Group	Yoga Practice with Aerobic Training Group	Control Group	Mean Difference	CI
7.98		8.33	0.35*	0.06
7.98	7.84		0.14*	
	7.84	8.33	0.49*	
Adjusted Post-test Mean Difference on Agility				
18.11		18.83	0.72*	0.12
18.11	17.69		0.42*	
	17.69	18.83	1.14*	
Adjusted Post-test Mean Difference on Muscular Strength & Endurance				
34.11		29.88	4.23*	0.49
34.11	36.61		2.50*	
	36.61	29.88	6.73*	

\*Significant at 0.05 level of confidence

Table 2 indicates the results of the Scheffé’s test for the difference between adjusted post-test mean values on speed. The comparison between the yoga practice group and the control group yielded a difference of (0.35), yoga practice group and yoga practice with aerobic training group (0.14) and while the yoga practice with aerobic training group versus the control group exhibited a difference of (0.49). These differences were found to be significant at the 0.05 level of confidence. Moreover, significant differences were observed in agility between the yoga practice group and the control

group (0.72), yoga practice group and yoga practice with aerobic training group (0.42), and yoga practice with aerobic training group and control group (1.14). Additionally, significant differences were found in muscular strength & endurance between the yoga practice group and the control group (4.23), the yoga practice group and yoga practice with aerobic training group (2.50), and the yoga practice with aerobic training group and the control group (6.73), all significant at the 0.05 level of confidence following the respective training programs.

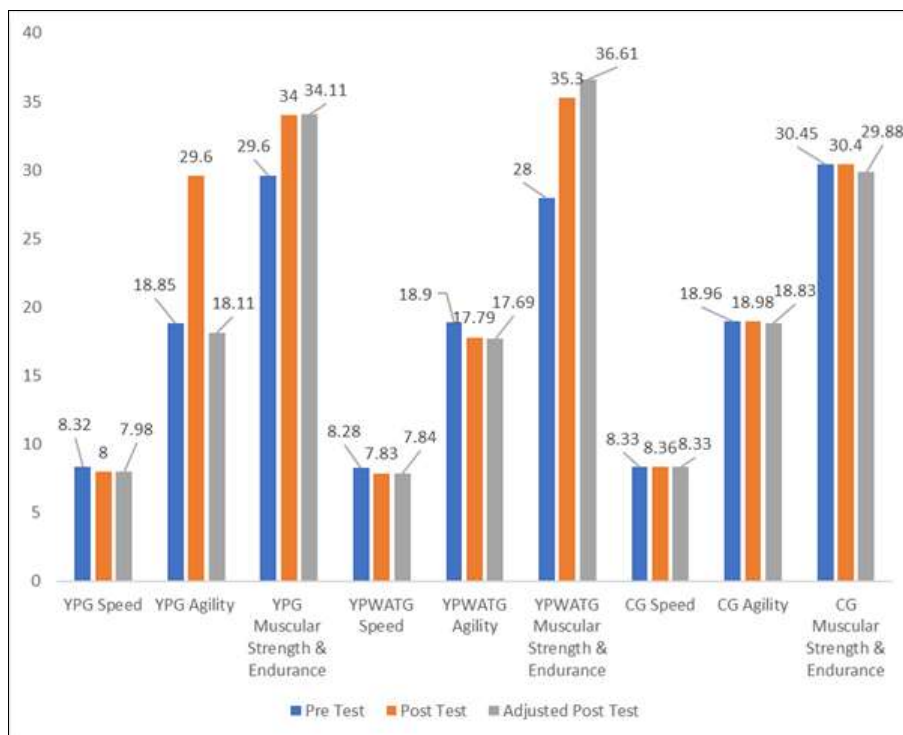


Fig 1: Furthermore, the study's results indicated no significant difference between the training groups on the selected criterion variables

Table 3: Analysis of Covariance on Selected Physiological Variables of Yogic Practices and Yogic Practices with aerobics training and Control Groups

Variable Name	Test	Yoga Practice Group	Yoga Practice with Aerobic Training Group	Control Group	'F' Ratio
VO <sub>2</sub> max	Pre-test Mean ± S.D	53.10±3.52	54.02±2.41	53.90±3.39	0.39
	Post-test Mean ± S.D	55.86±2.98	58.78±1.76	53.82±3.41	17.91*
	Adj. Post-test Mean	56.35	58.56	53.69	90.26*
Systolic Blood Pressure	Pre-test Mean ± S.D	129.90±10.17	128.95±6.50	129.70±5.44	0.18
	Post-test Mean ± S.D	123.70±5.05	115.28±14.71	130.20±4.63	34.01*
	Adj. Post-test Mean	123.57	118.51	130.11	36.28*
Diastolic Blood Pressure	Pre-test Mean ± S.D	86.20±5.87	87±4.92	82.9±7.35	1.83
	Post-test Mean ± S.D	81.60±4.67	79.80±2.89	85.10±6.58	6.10*
	Adj. Post-test Mean	81.27	79.20	85.91	9.61*

\*Significant at 0.05 level of confidence. (The table value required for significance at 0.05 level of confidence with df 2 and 57, 2 and 56 were 3.15 respectively)

Table 3 displays the results indicating that pre-test mean 'F' ratio for VO<sub>2</sub> max in the yogic practices, yogic practices with aerobics training and control groups was 0.39, which was found to be insignificant at the 0.05 level of confidence. However, the post-test and adjusted post-test mean 'F' ratio value for the experimental groups and the control group was 17.91 and 90.26, respectively, showing significance at the 0.05 level of confidence.

Similarly for systolic blood pressure, the pre-test mean 'F' ratio for the yogic practices, yogic practices with aerobics training and control groups was 0.18, which was insignificant at the 0.05 level of confidence. However, post-test and

adjusted post-test mean 'F' ratio value for the experimental group and control group was 34.01 and 36.28, respectively, showing significance at the 0.05 level of confidence.

For diastolic blood pressure, the pre-test mean 'F' ratio for the yogic practices, yogic practices with aerobics training and control groups was 1.83, which was insignificant at the 0.05 level of confidence. However, post-test and adjusted post-test mean 'F' ratio value for the experimental groups and the control group was 6.10 and 9.61, respectively, showing significance at the 0.05 level of confidence. To determine which paired means exhibited significant differences among the groups, the Scheffé’s test was employed.

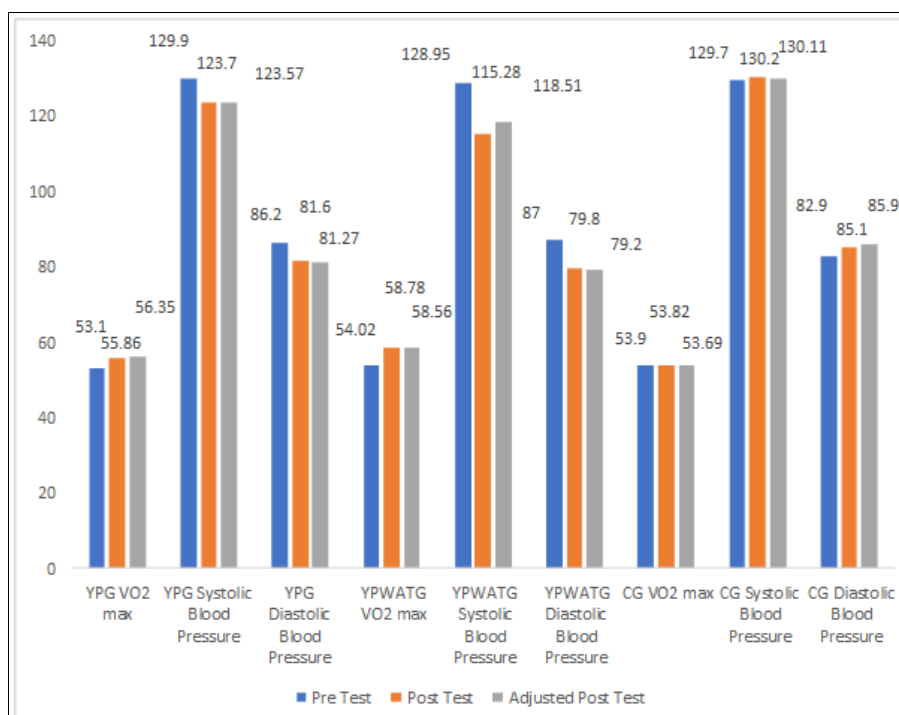
**Table 4:** Scheffe’s Post Hoc Test for the Difference between the Adjusted Post-Test Mean of VO<sub>2</sub> max, Systolic Blood Pressure and Diastolic Blood Pressure

Adjusted Post-test Mean Difference on VO <sub>2</sub> max				
Yoga Practice Group	Yoga Practice with Aerobic Training Group	Control Group	Mean Difference	CI
56.35		53.69	2.66*	0.32
56.35	58.56		2.21*	
	58.56	53.69	4.87*	
Adjusted Post-test Mean Difference on Systolic Blood Pressure				
123.57		130.11	6.54*	0.54
123.57	118.51		5.06*	
	118.51	130.11	11.60*	
Adjusted Post-test Mean Difference on Diastolic Blood Pressure				
81.27		85.91	4.64*	0.61
81.27	79.20		2.07*	
	79.20	85.91	6.71*	

\*Significant at 0.05 level of confidence

Table 4 indicates the results of the Scheffe’s Test for the difference between adjusted post-test mean values on VO<sub>2</sub> max. The comparison between the yoga practice group and the control group yielded a difference of (2.66), yoga practice group and yoga practice with aerobic training group (2.21) and while yoga practice with aerobic training group versus control group exhibited a difference of (4.87). These differences were found to be significant at the 0.05 level of confidence. Moreover, significant differences were observed in systolic

blood pressure between yoga practice group and control group (6.54), yoga practice group and yoga practice with aerobic training group (5.06), and yoga practice with aerobic training group and control group (11.60). Additionally, significant differences were found in diastolic blood pressure between yoga practice group and control group (4.64), the yoga practice group and yoga practice with aerobic training group (2.07), and yoga practice with aerobic training group and control group (6.71), all significant at the 0.05 level of confidence following the respective training programs.



**Fig 2:** Furthermore, the study's results indicated no significant difference between the training groups on the selected criterion variables

**Discussion on Findings**

In this study, the Analysis of Covariance (ANCOVA) of physical fitness and physiological variables was carried in two different experimental groups with the inclusion of yogic practices and yogic practices with aerobics training programme. The same analysis was carried out in control group without inclusion of training programme. From these analyses, it was found that the results obtained from experimental groups had significant improvement on the physical fitness and physiological variables when compared with control group. This was due to influence of yogic practices and yogic practices with aerobics training

programme with in the analysis of experimental groups. It was interesting to note that the result of physical fitness and physiological variables such as speed, agility, muscular strength & endurance, vo<sub>2</sub> max, systolic blood pressure and diastolic blood pressure concluded that the yogic practices with aerobics training group was better than yogic practices group and control group. This in turns helps to develop to the male college students. The findings of the study had close relationship with the results of the previous study conducted by (Yokesh and Chandrasekaran., 2011) [1], (Singh., 2019) [2], (Doijad *et al.*, 2013) [3] and (Arasi and Maniazhagu., 2014) [5].

## Conclusion

Illustration upon the study's findings and considering its essential limitations, it becomes evident that the integration of yogic practices and yogic practices with aerobics training has a noticeable positive influence on improving physical fitness and physiological variables among male college students. Furthermore, significant progress was observed within the selected variables of the yogic practices and yogic practices with aerobics training group, evident after a twelve-week period of specialized training. This solidifies the notion that this training regimen is effective in enhancing both speed, agility, muscular strength & endurance,  $VO_2$  max, systolic blood pressure and diastolic blood pressure.

1. It can be inferred that the personalized implementation of yogic practices demonstrated statistically significant and positive effects throughout the intervention period, contributing to the improvement of physical fitness and physiological variables among male college students.
2. It can be conditional that the improved application of yogic practices with aerobics training demonstrated statistically significant and positive effects throughout the intervention period, contributing to the improvement of physical fitness and physiological variables among male college students.
3. It is apparent that the individualized interventions applied by control group, while showing a positive trend did not yield statistically significant results within the given timeframe. This applies to physical fitness and physiological variables among male college students.
4. Upon comparison, the comparative outcomes lead to the conclusion that yogic practices with aerobics training group exhibited significantly more pronounced advancements in physical fitness and physiological variables when contrasted with the performance of yogic practices and control groups. This discrepancy underscores the superior impact of specialized training on speed, agility, muscular strength & endurance,  $VO_2$  max, systolic blood pressure and diastolic blood pressure in male college students.

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