



## Physical Education

## EFFECTS OF PRANAYAMA, SURIYANAMASKAR AND COMBINED PRACTICES ON CARDIORESPIRATORY ENDURANCE OF COLLEGE STUDENTS

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**ABSTRACT** The purpose of the study was to find out the effects of pranayama, suriyanamaskar and combined practices on cardiorespiratory endurance of college students. To achieve the purpose of the study, sixty college women students from Alagappa Arts College, Karaikudi, Tamilnadu were selected as subjects. The age, height and weight of the subjects ranged from 18 to 21 years, 155 to 162 centimeters and 45 to 55 kilograms respectively. The selected subjects were randomly assigned into four equal groups of 15 subjects each. Group I underwent pranayama practice, group II underwent suriyanamaskar practice, group III underwent combined practice of pranayama and suriyanamaskar practice and group – IV acted as control. The collected data analysed by analysis of covariance (ANCOVA). Since three groups were involved, whenever the obtained 'F' ratio for adjusted post test means was found to be significant, the Scheffe's test was applied as post hoc test to determine the paired mean differences. Twelve weeks of combined practice induced to increase on cardiorespiratory endurance of the college women students.

## KEYWORDS :

## INTRODUCTION

Pranayama is the fourth "limb" of the eight limbs of Ashtanga Yoga mentioned in verse 2.29 in the Yoga Sutras of Patanjali. Patanjali, a Hindu Rishi, discusses his specific approach to pranayama in verses 2.49 through 2.51, and devotes verses 2.52 and 2.53 to explaining the benefits of the practice. Patanjali does not fully elucidate the nature of prana, and the theory and practice of pranayama seem to have undergone significant development after him. He presents pranayama as essentially an exercise that is preliminary to concentration, as do the earlier Buddhist texts (Pande, 1990).

Surya Namaskar or Sun Salutation is a Yoga warm up routine based on a sequence of charmingly linked asanas (Carol, 2003). The nomenclature refers to the symbolism of Sun as the soul and the source of all life. It is relatively a modern practice that developed in the 20th century (Mark, 2010). Surya Namaskara may also refer to other styles of "Sun Salutations". A yogi may develop a personalized yoga warm up routine as surya namaskar to pave the way his or her asana practice (Donna, 1990). The Yoga Body, Mark Singleton states Suryanamaskar may have been invented by Patinidhi Pant, the Rajah of Aundh. Raja adds that there is no evidence that the Suryanamaskara sequence was practiced prior to the early 20th century. According to Alter, while Pant Pratinidhi of Aundh called the warm up routine as surya namaskar,

how exactly Surya Namaskara came to be included in the yogic practices of Hatha and Ashtanga Yoga in India remains unclear (Alter, 2000).

## METHODOLOGY

The purpose of the study was to find out the effects of pranayama, suriyanamaskar and combined practices on cardiorespiratory endurance of college students. To achieve the purpose of the study, sixty college women students from Alagappa Arts College, Karaikudi, Tamilnadu were selected as subjects. The age, height and weight of the subjects ranged from 18 to 21 years, 155 to 162 centimeters and 45 to 55 kilograms respectively. The selected subjects were randomly assigned into four equal groups of 15 subjects each. Group I underwent pranayama practice, group II underwent suriyanamaskar practice, group III underwent combined practice of pranayama and suriyanamaskar practice and group – IV acted as control.

Cardiorespiratory endurance was measured by Cooper 9 minutes run / walk test. The collected data analysed by analysis of covariance (ANCOVA). Since three groups were involved, whenever the obtained 'F' ratio for adjusted post test means was found to be significant, the Scheffe's test was applied as post hoc test to determine the paired mean differences

## RESULTS

## ANALYSIS OF COVARIANCE ON CARDIORESPIRATORY ENDURANCE OF EXPERIMENTAL AND CONTROL GROUPS

	Pranayama Practice	Suriyanamaskar Practice	Combined Practice	Control Group	S O V	Sum of Squares	df	Mean squares	'F' ratio
Pre test Mean	1047.93	1057.73	1049.13	1048.93	B	937.20	3	312.40	0.47
SD	32.36	27.34	22.82	17.77	W	36848.53	56	658.01	
Post test Mean	1197.40	1240.86	1280.53	1051.33	B	450618.53	3	150206.17	207.88*
SD	34.01	28.05	14.06	27.35	W	40462.40	56	722.54	
Adjusted Post test Mean	1197.52	1240.57	1280.61	1051.41	B	448928.96	3	149642.98	203.74*
					W	40394.89	55	734.45	

(The required table value for significance at 0.05 level of confidence with degrees of freedom 3 and 55 is 2.77 and degree of freedom 3 and 56 is 2.77)\*Significant at .05 level of confidence

The adjusted post test means on cardiorespiratory endurance of pranayama practice, suriyanamaskar practice, combined pranayama and suriyanamaskar practice groups and control groups are 1197.52, 1240.57, 1280.61 and 1051.41 respectively. The obtained 'F' ratio value of 203.74 on cardiorespiratory endurance were greater than the

required table value of 2.77 for the degrees of freedom 3 and 55 at 0.05 level of confidence. It is observed from this finding that significant differences exist among the adjusted post test means of experimental and control groups on cardiorespiratory endurance.

Since, the adjusted post test 'F' ratio value is found to be significant the Scheffe's test is applied as post hoc test to determine the paired mean differences, and it is presented in table-II.

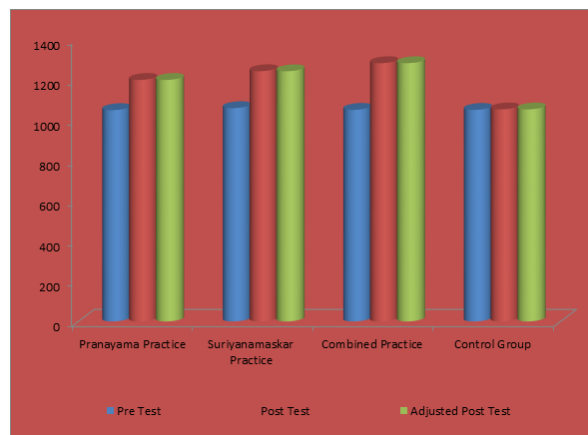
**Table-II SCHEFFE'S TEST FOR THE DIFFERENCE BETWEEN THE ADJUSTED POST TEST PAIRED MEANS OF CARDIORESPIRATORY ENDURANCE**

Adjusted Post Test Means				DM	CI
Pranayama Practice	Suriyanamaskar Practice	Combined Practice	Control Group		
1197.52	1240.57			43.05*	20.17
1197.52		1280.61		83.09*	20.17
1197.52			1051.41	146.11*	20.17
	1240.57	1280.61		40.04*	20.17
	1240.57		1051.41	189.16*	20.17
		1280.61	1051.41	229.20*	20.17

\*significant

Table-II shows the Scheffe's test results that there are significant differences between the adjusted post tests means of pranayama practice and suriyanamaskar practice groups; pranayama practice and combined pranayama and suriyanamaskar practice groups; pranayama practice and control groups. suriyanamaskar practice and combined pranayama and suriyanamaskar practice groups; suriyanamaskar practice and control groups. combined pranayama and suriyanamaskar practice and control groups on cardiorespiratory endurance. More over the combined pranayama and suriyanamaskar practice had high impact to improve the cardiorespiratory endurance of the subjects.

**Figure – I  
CYLINDER DIAGRAM SHOWING THE MEAN VALUE ON CARDIORESPIRATORY ENDURANCE OF EXPERIMENTAL AND CONTROL GROUPS**



### Discussion and Conclusion

The result of the study explore that the significant differences exist among the experimental and control groups on cardiorespiratory endurance. More over the result showed that combined pranayama and suriyanamaskar practice groups had better influence to increase cardiorespiratory endurance of the college students when compared to pranayama practice, suriyanamaskar practice groups. The following studies are supporting my finding of the study.

Kunwar, *et. al.*, (2017) found out the impact of bhrumari pranayama on cardio respiratory endurance of the cricket players with special reference to prakriti. They concluded that practice of bhrumari pranayama is effective for improving cardio respiratory endurance of cricket players.

Juliana and others (2017) evaluated the effects of a 12-week systematized yoga intervention on health-related physical fitness components. Researchers found that a 12-week yoga program increased cardiorespiratory fitness.

Santosh (2016) investigated the effect of Pranayama on cardio-vascular Endurance. Six week yoga training programme shows positive effects on cardio-vascular endurance.

Yuvaraj (2016) found out the effect of asana and pranayama practices on selected physical and physiological variables of college men. He was concluded that the asana and pranayama practices help to significantly improved on cardio respiratory endurance.

### Conclusion

The conclusion of the study explore that the significant differences exist among the experimental and control groups on cardiorespiratory endurance.

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