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Effect of asana and meditation on heart rate of the college students

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Abstract
The aim of the study was designed to determine the Impact of Asana and Meditation on Heart Rate of the College Students. To attain the purpose, forty five (N=45) College students studying various colleges in and around Karaikudi, India during the academic year 2021-2022 were selected randomly as subjects. Their age ranged from 18 to 21 years. The subjects were assigned at random into three groups of fifteen each (n=15). Group-I underwent Yogasana Practice (n=15), Group-II underwent Meditation Practice (n=15) and Group-III acted as Control. The dependent variable selected for this study was Heart Rate and it was assessed by Heart Rate Monitor. All the subjects were tested prior to and immediately after the training for the selected variable. Data were collected and statistically analyzed using ANCOVA. Scheffe's post hoc test was applied to determine the significant difference between the paired means. In all the cases 0.05 level of significance was fixed. The results of the study showed that there was a significant difference among all the experimental groups' namely Yogasana Practices and Meditation Practices. Further the results showed Meditation group was found to have greater impact on the group concerned than the Yogasana group and Control group in enhancing the performance of Heart Rate.

Keywords: yogasana practices, meditation practices, heart rate

Introduction
Yoga is the oldest known science of self-development, originated in ancient India. Yogic practices are a physical and mental exercise practiced throughout the world. Many research studies of the past report that yogic training improves the physical & mental fitness level as well as the performance of sports persons in various sports disciplines *(Alva and Gerald, 2017).*
Yoga is an ancient physical and spiritual discipline and branch of philosophy that originated in India reportedly more than 5,000 years ago. The word yoga comes from the Sanskrit word *yuj*, which means to yoke, join, or unite. The Iyengar School of yoga defines yuj as the "joining or integrating of all aspects of the individual-body with mind and mind with soul-to achieve a happy, balanced and useful life." The ultimate aim of yoga, they claim, is to reach kaivalya (emancipation or ultimate freedom) *(Anita Verma et al., 2017).*
Yoga has a hoary past. The importance for the spiritual attainment has been recognized throughout the ages by all the systems of Indian philosophy. There is no doubt that the essence of yoga has been considered in the spiritual upliftment of man. One may question as to how then yoga is related to the physical education and whether yoga will not be pulled down from its highest pedestal in doing this. It is necessary, therefore, to clear the concepts of yoga and physical education first *(Gharote, 1976).*
Meditation follows concentration and concentration merges into meditation. Concentration is holding the mind on to some particular object. A consistent flow of thought or knowledge with regard to the object of concentration. During meditation the fluctuation of mind is converted into focused and one pointed.
Meditation is a natural state of consciousness that is not 'learned' any more than you learn to sleep. When the mind becomes one-pointed and steady, it will naturally go beyond the normal mundane awareness into the state referred to as meditation *(Denniston and Me Williams, 1975).*
Meditation helps us to rid ourselves of emotional conflict, inner discard and psychological tension. It completely purifies the mind and releases it from unconscious obstruction. Meditation enables the inner light to manifest itself. This is responsible for the awakening of self-awareness; hence one may penetrate to the very centre of life's highest values by transcending the external and logical world *(Devananda, 1984).*

Methodology
The study was conducted on forty five (N=45) College students studying various colleges in and around Karaikudi, India during the academic year 2021-2022 were selected randomly as subjects. Their age ranged from 18 to 21 years. The subjects were assigned at random into three groups of fifteen each (n=15). Group-I

underwent Yogasana Practice (n=15), Group-II underwent Meditation Practice (n=15) and Group-III acted as Control. The experimental groups underwent the respective training for a period of 12 weeks (3 days/week), whereas the control remain as normal with the sedentary life. The dependent variable selected for this study was Heart Rate and it was assessed by Heart Rate Monitor. All the three groups were tested on selected Heart Rate was analyzed before and after the training period.

Analysis of the Data

The data collected from the experimental groups and control group on prior and after experimentation on selected variables were statistically examined by analysis of covariance (ANCOVA) was used to determine differences, if any among the adjusted posttest means on selected criterion variables separately. Whenever they obtained f-ratio value was significant the Scheffe's test was applied as post hoc test to determine the paired mean differences, if any. In all the cases 0.05 level of significance was fixed.

The results of the dependent 't'-test on the data obtained for Heart Rate of the subjects in the pre-test and post-test of the Experimental groups and control group have been analyzed and presented in Table-1.

Table 1: Summary of mean standard deviation and dependent 't' test for the pre and post tests on heart rate of experimental groups and control group (Heart Rate is expressed in Beats per Minute)

Test	Descriptive Statistics	Yogasana Practices Group-I	Meditation Practices Group-II	Control Group-III
Pre Test	Mean	74.73	74.40	74.07
	SD (±)	0.68	0.49	1.18
Post Test	Mean	72.27	72.33	74.20
	SD (±)	0.44	0.47	1.17
"t" Test		11.78*	11.77*	0.31

***** *Significant at 0.05 level.*

The table value required for 0.05 level of significance with df 14 is 2.15.

Table-1 shows that the pre-test mean and standard deviation of Heart Rate values of Yogasana Practices group, Meditation Practices group and Control group are 74.73±0.68, 74.40±0.49 and74.07±1.18 respectively. The post-test mean and standard deviation are 72.27±0.44, 72.33±0.47 and 74.20±1.17 respectively.

The obtained dependent t-ratio values between the pre and post test means on Heart Rate of Yogasana Practices group, Meditation Practices group and Control group are 4.29, 8.46, and 0.03 respectively. The table value required for significant difference with df 14 at 0.05 level is 2.15. It was concluded that Yogasana Practices group, Meditation Practices group had registered significant decrease in Heart Rate performance.

The analysis of covariance on Heart Rate of the pre, post, and adjusted test scores of Yogasana Practices group, Meditation Practices group and Control group have been analyzed and presented in Table – 2.

Table 2: Computation of Analysis of covariance of Pre Test, Post Test and Adjusted Post Test on Heart Rate of Experimental Groups and Control Group

Test	Yogasana Practices Group-I	Meditation Practices Group-II	Control Group-III	Source of Variance	Sum of Squares	df	Mean Squares	F-ratio
Pre-Test Mean	74.73	74.40	74.07	Between groups	3.33	2	1.67	2.22
				Within Groups	31.47	42	0.75	
Post-Test Mean	72.27	72.33	74.20	Between groups	36.11	2	18.07	28.45*
				Within groups	26.67	42	0.63	
Adjusted Post-Test Mean	72.02	72.33	74.44	Between sets	47.74	2	23.87	97.39*
				Within Sets	10.05	41	0.25	

* Significant at 0.05 level of confidence

Table value for df (2, 42) at 0.05 level = 3.22 Table value for df (2, 41) at 0.05 level = 3.23

(Heart Rate scores are in Beats per Minute)

Table-2 shows that the obtained F-ratio value 2.22 for pretest mean of Yogasana Practices group, Meditation Practices group and Control group on Heart Rate is less than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of confidence.

The obtained F-ratio value of 28.45 for posttest mean of Yogasana Practices group, Meditation Practices group and Control group on Heart Rate is more than the required table value of 3.22 for significance with df 2 and 42 at 0.05 level of confidence.
The obtained F-ratio value of 97.39 for adjusted posttest mean of Yogasana Practices group, Meditation Practices group and Control group on Heart Rate is higher than the required table value of 3.23 for significance with df 2 and 41 at 0.05 level of confidence.
The results of the study indicated that there is a significant difference between the adjusted post-test means of Yogasana Practices group, Meditation Practices group and Control group on Heart Rate.
Since, three groups are compared and whenever the obtained 'F' ratio for adjusted posttest is found to be significant, Scheffe's test is used to find out the paired mean difference and it is presented in Table-3.

Table 3: Scheffe's Test for the Difference between Paired Means on Heart Rate

Yogasana Practices Group-I	Meditation Practices Group-II	Control Group	Mean Difference	Confident Interval Value
72.02	72.33	---	0.31	0.46
72.02	---	74.44	2.42*	
---	72.33	74.44	2.11*	

**Significant at 0.05 level of confidence.*

Table-3 shows that the mean difference values of Yogasana Practices group and Control group, Meditation Practices group and Control group are 2.42, and 2.11 respectively, which are greater than the confidence interval value of 0.46 on Heart Rate at 0.05 level of confidence. Further the table shows that the mean difference values of Yogasana Practices group and Meditation Practices group is 0.31 respectively, which is lesser than the confidence interval value of 0.46 on Heart Rate at 0.05 level of confidence.
The results of the study showed that there was a significant difference between Yogasana Practices group and Control group, Meditation Practices group and Control group. Further the results of the study showed that there is no significant difference between Yogasana Practices group and Meditation Practices group.
The above data also reveal that Meditation Practices group had shown better performance than Yogasana Practices group and Control in Heart Rate.
The pre and posttest mean values of Yogasana Practices group, Meditation Practices group and Control group on Heart Rate are graphically represented in the Figure -1.
The adjusted post mean values of Yogasana Practices group, Meditation Practices group and Control group on Heart Rate are graphically represented in the Figure -2.

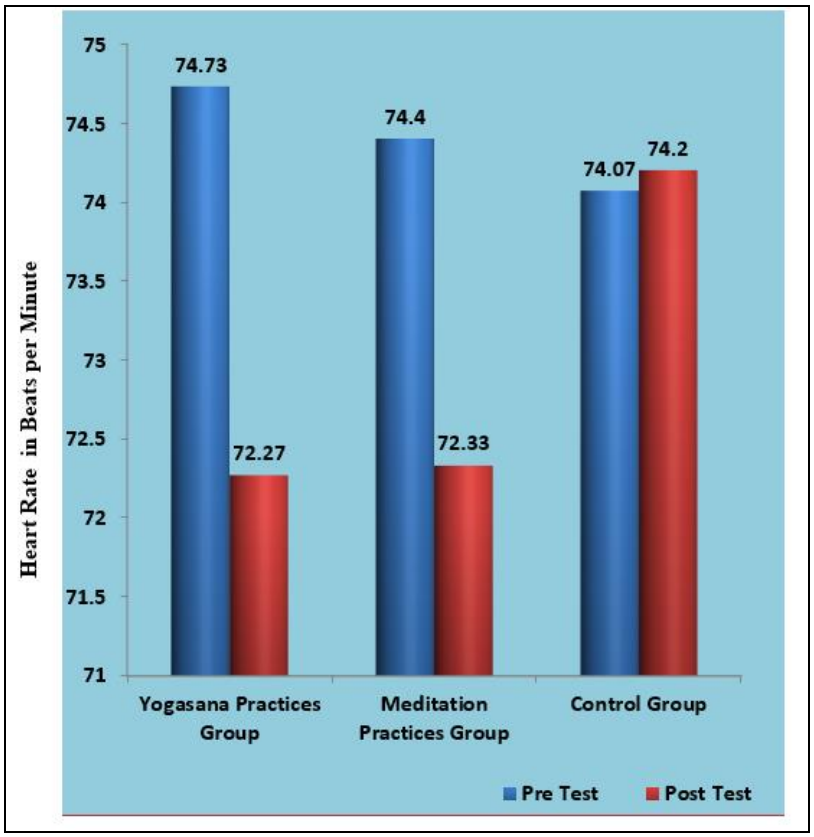

Fig 1: The Pre and Posttest Mean Values of Yogasana Practices group, Meditation Practices group and Control group on Heart Rate

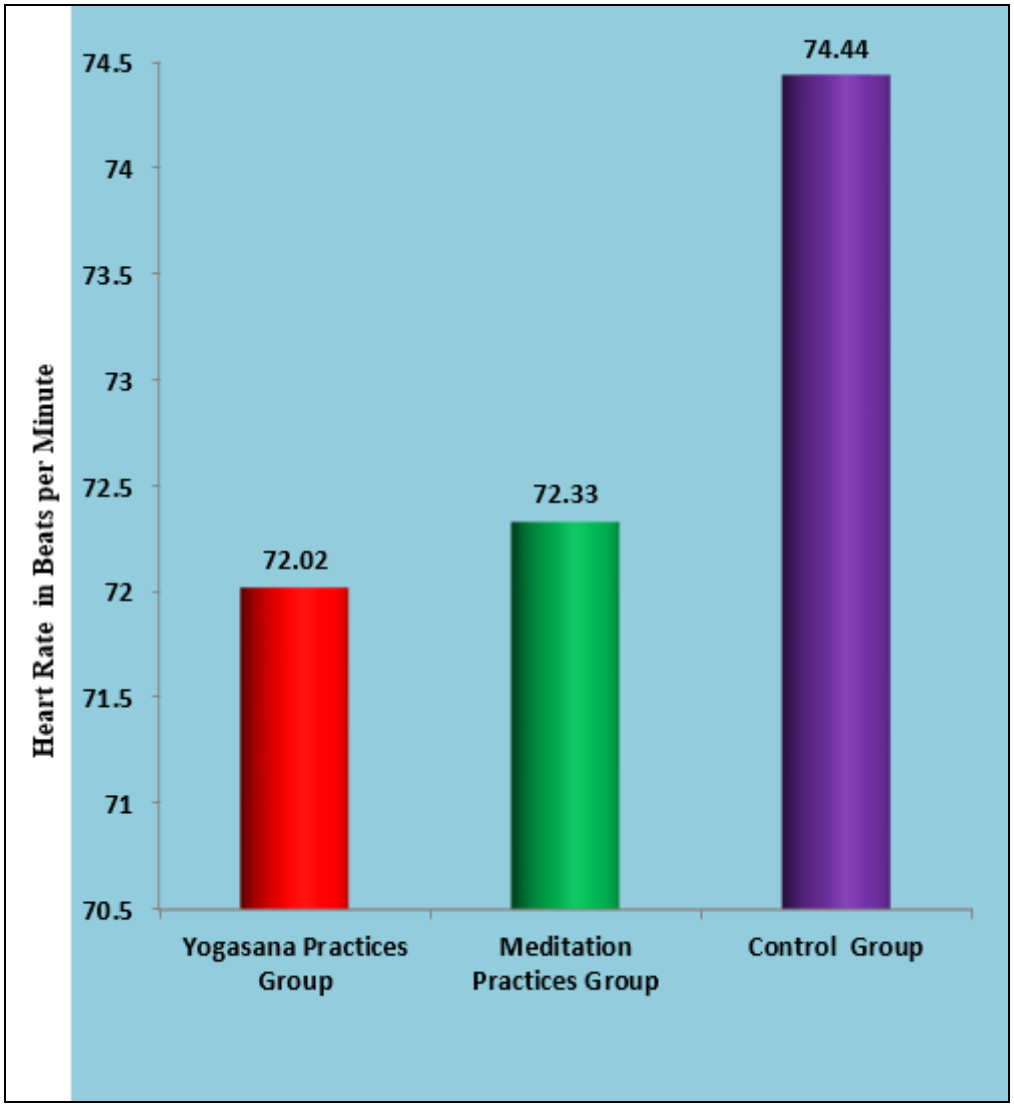

Fig 2: The Adjusted Post Test Mean Values of Yogasana Practices group, Meditation Practices group and Control group on Heart Rate

Conclusion

From the analysis of the data, the following conclusions were drawn.

Significant differences in achievement were found between Yogasana Practices group, Meditation Practices group, and Control group in the selected criterion variable on Heart Rate.

The experimental groups namely, Yogasana Practices group, Meditation Practices group, had significantly increased in Heart Rate.

The Meditation Practices group was found to be better than the Yogasana Practices group and Control group in decreasing Heart Rate performance.

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