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Comparative effect of specific exercises and yogasanas on selected physiological variables of college students

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■ **ABSTRACT**

The main purpose of the study was to find out the effects of Yogasanas and specific exercises on selected physiological variables of college students. For this study, forty five subjects were randomly selected from the Dr. Babasaheb Nandurkar College of Physical Education, Yavatmal, Maharashtra. Ages of the subjects were ranging 18 to 25 years. The selected subjects were further randomly divided into three equal groups namely, Yoga asana group-I, Exercise group-II and control group. Each group consisted of fifteen subjects. The interventional training programmes for this study were eight weeks Yogasana training for experimental group-I and six weeks specific exercise for experimental group-II and the control group was not given any training during the period of six weeks except of their daily routine. Data were collected on the selected physiological variables of the subjects before and after the training period of eight weeks of Yogasanas and specific exercises. The data obtained were statistically analyzed with the help of analysis of co-variance (ANCOVA). The finding of the results concluded that specific exercises and Yogasanas showed significant improvement in breath holding capacity, resting pulse rate and respiratory rate of the selected subjects.

■ ***Key Words*** **:** Yogasana, Exercises, Physiological variables

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Yoga is recognized as one of the most important and valuable heritage of India. Positive changes in the life style of the people can be brought through Yoga. It is a way of life or science of right living and integrated system of education for body mind and soul. It works on all aspects of the person physical, mental, emotional and spiritual. Yoga is part of living and asanas are very effective and useful for both physical and mental health development. It helps to keep the internal and external organs of the body strong. Regular participation of Yoga markedly influences physical, physiological and mental fitness of an individual. Yogasanas is the only exercise which affects the inmost parts of the body. The health of our body and mind depends on the soundness of the health of our internal organs the heart, lungs, digestive system, glands, nervous system etc (Pandit, 1998).

Physical exercises are especially important for individual to develop strong intentions towards living a physically active life style. There are so many exercises which are important and applied for the development of health and physical fitness.

Appropriate form of exercises and Yoga asanas on a regular basis will be helpful for the development of physiological and motor ability components of an individual.

Purpose of the study :

The main purpose of the study was to find out the effects of Yogasanas and specific exercises on selected physiological variables of college students.

■ METHODOLOGY

To achieve the purpose of this study, forty five subjects were randomly selected from Dr. Babasaheb Nandurkar College of Physical Education, Yavatmal, Maharashtra. Ages of the

Table A : Schedule for yogasanas practices			
Day	Asanas	Time	Week
Monday to Saturday	Prescribed asanas	6.30 am to 7.15 am	1to 8 weeks

Table B : Schedule for specific exercises				
Exercise	Week 1st and 2nd	Week 3rd and 4th	Week 5th and 6th	Week 7th and 8th
Bajarang Dand	3 Repetitions	4 Repetitions	5 Repetitions	6 Repetitions
Push-ups	2 Sets (7 repetitions per set)	3 Sets (9 repetitions per set)	4 Sets (11 repetitions per set)	5 Sets (15 repetitions per set)
Sit-ups	2 Sets (10 repetitions per set)	3 Sets (13 repetitions per set)	4 Sets (16 repetitions per set)	5 Sets (20 repetitions per set)
Rope skipping	3 Sets (1 to 30 turn per set)	4 Sets (1 to 40 turn per set)	5 Sets (1 to 50 turn per set)	6 Sets (1 to 60 turn per set)

N.B:- After every set 10 sec. rest.

subjects were ranging 18 to 25 years. The selected subjects were further randomly divided into three equal groups namely, Yoga asana group-I, Exercise group-II and Control group. Each group consisted of fifteen subjects. The interventional training programmes for this study were eight weeks Yogasana training for experimental group-I and six weeks specific exercise for experimental group-II and the control group was not given any training during the period of six weeks except of their daily routine. The following Yogasanas were given to the Yogasana group: Halasana, Pachimottanasana, Dhanurasana, Bhujangasana, Sarbangasana, Chakrasana, Ardha-Matseyendrasana and Ustrasana. Specific exercises like Push ups, Sit ups, Bajarang Dand and Rope Skipping were given to exercise group. The Yogasana group and exercise group were administered on the basis of the following training schedule in Table A and B, respectively and the trainings were given in the morning and evening independently.

Test administration :

Data were collected on the selected physiological variables of the subjects before and after the training period of eight weeks of Yogasanas and specific exercises as per standard procedures.

The subjects were tested on the selected physiological variables as under:

Breath holding capacity :

It was measured in 'seconds' to the feeling of tolerance.

Respiratory rate :

It was counted by visually observing breathing movements of abdomen and chest.

Resting pulse rate:

It was counted the number of beats palpitated on radial artery at wrist and score as the number of beats in a minute.

Statistical analysis :

The collected data were analyzed by using of analysis of co-variance (ANCOVA) to see whether any significant difference on selected physiological variables exists between the pre - and post-test of the two experimental groups and control group (Verma, 2000).

■ OBSERVATIONS AND DISCUSSION

Table 1 shows that the analysis of co-variance for breath holding capacity indicated that the obtained F-ratio of 0.46 was insignificant in case of pre -test means. It is clear that the pre- test means did not differ significantly. The post-test means of all the three groups yielded on F-ratio of 4.86 which was significant at 0.05 level of confidence.

Table 1 : Analysis of co-variance of means of the three groups of breath holding capacity								
Test	Yoga asana group (n= 15)	Exercise group (n = 15)	Control group (n= 15)	Source of variance	Sum of square	df	Means square	F-ratio
Pre- test mean	44.68	44.72	43.25	B	14.02	2	7.01	0.46
				W	627.04	42	14.92	
Post -test mean	46.81	48.81	43.55	B	198.92	2	99.46	4.86*
				W	857.05	42	20.40	
Adjusted post -test mean	46.95	48.91	43.34	B	138.24	2	69.12	29.79*
				W	95.32	41	2.32	

B= Between the group, W= Within the group * indicate significance of value at p=0.5, respectively
Table F-ratio 2 and 42 (df) = 3.22, 2 and 41(df) = 3.22 at 0.05 level of confidence

The differences between the adjusted post- means were found significant as the obtained F-ratio was 29.79 which is grater than the tabulated F-ratio. Since, significant differences exist between the three groups in relation to breath holding capacity. Further, in order to determine which group differs significantly, Post hoc test was applied as shown in Table 4.

Data of Table 2 reveal that there was a significant difference between the control and Yogasana groups, control and exercise groups and Yoga asana and exercise groups as the means differences of 3.31, 5.57 and 2.26, respectively were greater than the critical difference of 1.58. Hence, all the three comparisons were significant. Thus, it was found that there was significant effect of Yogasanas and specific exercises on breath holding capacity of college students. It was also found that specific exercises were significantly better in improving the breath holding capacity of the subjects than the Yoga asanas.

Table 3 shows that the analysis of co-variance for resting pulse rate indicated that the obtained F-ratio of 0.06 was insignificant in case of pre -test means. It is clear that the pre-test means did not differ significantly. The post- test means of all the three groups yielded on F-ratio of 4.37 which was significant at 0.05 level of confidence.

The differences between the adjusted post -means were found significant as the obtained F-ratio was 23.13 which is grater than the tabulated F-ratio. Significant differences exised between the three groups in relation to resting pulse rate. Further, in order to determine which group differs significantly, post hoc test was applied as shown in Table 4.

Table 4 reveals that there was a significant difference between the control and Yogasana groups, control and exercise groups and Yogasana and exercise groups as the means differences of 3.18, 5.98 and 2.8, respectively were greater than the critical difference of 1.65. Hence, all the three comparisons were significant. Thus, it was found that there was significant effect of Yogasanas and specific exercises on resting pulse rate of college students. It was also found that Yogasanas were significantly better in improving resting pulse rate of the subjects than the specific exercises.

Table 5 shows that the analysis of co-variance for respiratory rate indicated that the obtained F-ratio of 0.95 was

Table 2 : Post hoc mean comparison of three groups

Yoga asana group	Exercise group	Control group	Mean difference	C.I value
46.65	--	43.34	3.31*	1.58
	48.91	43.34	5.57*	1.58
46.65	48.91		2.26*	1.58

Table 3 : Analysis of co-variance of means of the three groups of resting pulse rate

Test	Yoga asana group (n= 15)	Exercise group (n= 15)	Control group (n= 15)	Source of variance	Sum of square	df	Means square	F-ratio
Pre-test mean	76.2	75	76.1	B	0.26	2	0.13	0.06
				W	81.72	42	1.94	
Post-test mean	72	69.4	75.2	B	118.64	2	59.32	4.37*
				W	569.94	42	14.57	
Adjusted post-test mean	72	69.2	75.18	B	109.19	2	54.59	23.13*
				W	96.85	41	2.36	

Table 4 : Post hoc mean comparisons of three groups

Yoga asana group	Exercise group	Control group	Mean difference	C.I value
72	--	75.18	3.18*	1.65
--	69.2	75.18	5.98*	1.65
72	69.2	--	2.8*	1.65

Table 5 : Analysis of co-variance of means of the three groups of respiratory rate

Test	Yoga asana group (n= 15)	Exercise group (n= 15)	Control group (n= 15)	Source of variance	Sum of square	df	Means square	F-ratio
Pre -test mean	16.86	17.12	17.26	B	21.23	2	10.61	0.95
				W	472.5	42	11.25	
Post -test mean	14.33	15.02	17.12	B	127.38	2	63.69	5.24*
				W	509.52	42	12.14	
Adjusted post- test mean	14.12	15.53	17.04	B	84.92	2	42.46	29.28*
				W	59.69	41	1.45	

Table 6 : Post hoc mean comparisons of three groups

Yoga asana group	Exercise group	Control group	Mean difference	C.I value
14.12	--	17.04	2.92*	1.38
--	15.53	17.04	1.51*	1.38
14.12	15.53	--	1.41*	1.38

insignificant in case of pre -test means. It is clear that the pre-test means did not differ significantly. The post -test means of all the three groups yielded F-ratio of 5.24 which was significant at 0.05 level of confidence.

The differences between the adjusted post-means were found significant as the obtained F-ratio was 29.28 which is grater than the tabulated F-ratio. Significant differences existed between the three groups in relation to respiratory rate. Further, in order to determine which group differs significantly, Post hoc test was applied as shown in Table 6.

Table 6 reveals that there was a significant difference between the control and Yogasana groups, control and exercise groups and Yogasana and exercise groups as the means differences of 3.18, 5.98 and 2.8, respectively were greater than the critical difference of 1.38. Hence, all the three comparisons were significant. Thus, it was found that there was significant effect of Yogasanas and specific exercises on respiratory rate of college students. It was also found that specific exercises were significantly better in improving respiratory rate of the subjects than the Yogasanas.

The finding of the study showed that there were significant differences in breath holding capacity, resting pulse rate and respiratory rate due to the influences of Yogasanas and specific exercises. This proved that eight weeks training of Yogasanas and specific exercises significantly improved breath holding capacity, resting pulse rate and respiratory rate.

Conclusion :

On the basis of findings the following conclusions are stated :

- Specific exercises and Yogasanas showed significant improvement in breath holding capacity, resting pulse rate and respiratory rate of the selected subjects.
- Specific exercises were significantly better in improving breath holding capacity, resting pulse rate of the subjects than the Yogasanas.
- Finally it was concluded that Yogasanas significantly were better in improving resting pulse rate of the subjects than the specific exercises and control group did not show any significant improvement.

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