Research Paper Sport Science

Pranyama and Coordinative Ability

Abhijit Ghoshal	Ph.D. Scholar
Hadiuzzaman	Ph.D. Scholar,
Dr. T.R.Patanaik	Sports Officer, NIIT, Rourkela
Dr. S.R. Mishra	Retd. Principal

ABSTRACT

The purpose of this study was to find out the effect of Bhastrika and Ujjayi Pranayama on selected coordinative abilities among engineering students. For the purpose of the study five coordinative abilities variables were selected, they include Reactive Ability, Orientation Ability, Differentiation Ability, Balance Ability, and Rhythmic Ability. The Pranayama Training programme was conducted for six days a week for ten weeks. The data were collected before commencement of experimental treatment (pre-test) and at the conclusion of training period (post-test). The analysis of data revealed that the two experimental groups viz., Bhastrika Pranayama and Ujjayi Pranayama showed significant gains in performance of subjects in reaction ability, orientation ability, differentiation ability, balance ability and rhythmic ability after administration of yogic exercise for a duration of 12 weeks.

KEYWORDS Pranayama and Coordinative abilities

The earliest reference to Pranayama is found in the Vedic literature, which extends from approximately 1500 B.C. backward into a hoary past. In this period the practice of Pranayama had no independent position. As described in Baudhyanadharma Sutra Goutamadharma Sutra, the practice of Pranayama was mainly a part of some religious ceremony and the word pranayama was applied to a practice of holding the breath inside while reciting some Mantras in the mind. Probably this was done with an idea that when the breath is held inside, the wavering of the mind gets controlled and the mental recitation of the Mantra becomes more fruitful.

The purpose of this study was to find out the effect of Bhastrika and Ujjayi Pranayama on selected coordinative abilities among engineering students.

Ninety students, with age ranging between 17 to 22 years and studying in Bachelor of Engineering were randomly selected as subjects from Kalna Polytechnique College, Burdwan, W.B. All subjects were, then, randomly assigned to two experimental groups (A and B) and one control group (C), each consisting of 30 subjects. The experimental treatments were also assigned to the groups at random. The groups A and B were treated as experimental groups and were given training programmes of Bhastrika Pranayama and Ujjayi Pranayama respectively. The group – C served as a control group and continued participating in the normal programme of the college. For the purpose of the study five coordinative abilities variables were selected. The selected five coordinative abilities variables were Reactive Ability, Orientation Ability, Differentiation Ability, Balance Ability, Rhythmic Ability. The Training programme was conducted for six days a week for 12 weeks. The data were collected before commencement of experimental treatment (pre-test) and at the conclusion of training period (post-test). To find out the effect of Bhastrika Pranayama and Ujjayi Pranayama on selected coordinative abilities variables among engineering students, analysis of co-variance (ANCOVA) was employed at 0.05 level of significance.

Analysis of Co-Variance of The Means Of Two Experimental Groups and the Control Group in Reaction Ability Performance

	Groups			Sum of squares		df	Sum of squares	F- ratio
	Bhastrika Pranayam Group	Ujjai Pranayam Group	Control Group					
Pre-test Means	91.83	89.80	92.53	A	120.93	2	60.46	1.20
				W	4354.43	87	50.05	
Pre-test Means	94.26	91.53	92.73	A	112.62	2	56.31	1.26
				W	3871.18	87	44.49	
Adjusted Post-test Means	93.87	92.64	91.71	A	70.09	2	35.04	7.24*
				W	416.04	86	4.83	

*Significant at 0.05 level of significance, N= 90, A =Among Means variance, W=Within Group variance, F-Ratio needed for significance at 0.05 level of significance = 3.10 (2, 87) and 3.10 (2, 86). The analysis of co-variance for Reaction Ability performance indicated that the resultant F-ratio of 1.20 was insignificant in case of Pre-test means from which it is clear that the pre-test means does not differ significantly and that the random assignment of subjects to the two experimental groups was quite successful. The post-test means of all the three groups yielded F-ratio of 1.26, which was also insignificant at 0.05 level of confidence. The difference between the adjusted post means was found significant as the obtained F-ratio was 7.24. The F-ratio needed for significance at 0.05 level of confidence was 3.10. As the difference between the adjusted means for three groups were found significant, the critical difference for adjusted means was applied to find out which of the differences between the paired adjusted final means were not significant.

Paired Adjusted Final Means and Differences between Means for the two Experimental Groups and Control Group

Means			Difference between Means	Critical difference for adjusted Means
Bhastrika Pranayam Group	Ujjai Pranayam Group	Control Group		
93.87	92.24		0.93	1.22
93.87		91.71	2.16*	1.22
	92.24	91.71	1.23*	1.22

It is evident from above Table that significant difference was found between adjusted final mean of Bhastrika Pranayama group and control group; Ujjayi Pranayama group and control group since the difference between means was higher than critical difference for adjusted means. On the other hand in significant difference was found between the adjusted final means of Bhastrika Pranayama group and Ujjayi Pranayama group since difference between mean was lower than critical difference for adjusted means.

Analysis of Co-Variance of the Means of Two Experimental Groups and The Control Group in Orientation Ability Performance

	Groups			Sum of squares		df	Sum of squares	F- ratio
	Bhastrika Pranayam Group	Ujjai Pranayam Group	Control Group					
Pre-test Means	8.45	8.26	8.35	A	0.56	2	0.28	2.31
				W	10.66	87	0.12	
Pre-test Means	8.50	8.26	8.29	A	0.95	2	0.47	4.24*
				W	9.74	87	0.11	
Adjusted Post-test Means	8.43	8.33	8.29	A	0.30	2	0.15	2.46
				W	5.39	86	0.06	

*Significant at 0.05 level of significance, N = 90, A =Among means variance, W =Within Group variance. F-Ratio needed for significance at 0.05 level of significance = 3.10 (2, 87) and 3.10 (2, 86). The analysis of co-variance for Orientation Ability performance indicated that the resultant F-ratio of 2.31 was insignificant in case of pre-test means, from which it is clear that the pre-test means does not differ significantly and that the random assignment of subject to the two experimental groups was quite successful. The post-test means of all the three groups yielded F-ratio of 4.24, which significant at 0.05 level of confidence. The difference between the adjusted post means was found insignificant as the obtained F-ratio was 2.46. The F-ratio needed for significance as 0.05 level of confidence was 3.10.

As the difference between the adjusted means for three groups were not found significant, the critical difference for adjusted means was not applied to find out which of the differences between the paired adjusted final means were not significant.

Analysis of Co-Variance of the Means of two Experimental Groups and the Control Group in Differentiation Ability Performance

	Groups			Sum of squares		df	Sum of squares	F- ratio
	Bhastrika Pranayam Group	Ujjai Pranayam Group	Control Group					
Pre-test Means	7.50	7.93	7.35	A	3.48	2	1.74	0.39
				W	384.83	87	4.42	
Pre-test Means	9.86	10.60	7.50	A	157.48	2	78.74	13.75*
				W	498.16	87	5.72	
Adjusted Post-test Means	10.02	10.32	7.62	A	131.28	2	65.64	46.82*
				W	120.56	86	1.40	

*Significant at 0.05 level of significance, N= 90, A= Among Means variance, W=Within Group variance , F-Ratio needed for significance at 0.05 level of significance = 3.10 (2, 87) and 3.10 (2, 86). The analysis of co-variance for Differentiation Ability performance indicated that the resultant F-ratio of 0.39 was insignificant in case of pre-test means from which it is clear that the pre-test means does not differ significantly and that the random assignment of subjects to the two experimental groups was quite successful. The post-test means of all the three groups yielded F-ratio of 13.75 which was significant at 0.05 level of confidence. The difference between the adjusted post means was found significant as the obtained F-ratio was 46.82. The F-ratio needed for significance at 0.05 level of confidence was 3.10. As the difference between the adjusted means for three groups were found significant, the critical difference for adjusted means was applied to find out which of the differences between the paired adjusted final means were not significant.

Paired Adjusted Final Means and Differences between Means for the Two Experimental Groups and Control Group in Differentiation Ability Performance

Means			Difference between Means	Critical difference for adjusted Means
Bhastrika Pranayam Group	Ujjai Pranayam Group	Control Group		
10.02	10.32		0.30	0.60
10.02		7.62	2.40*	0.60
	10.32	7.62	2.70*	0.60

*Significant at 0.05 level. It is evident from the above Table that significant difference was found between adjusted final means of Bhastrika Pranayama group and control group; Ujjayi Pranayama group and control group since the difference between means was higher than critical difference for adjusted means. On the other hand insignificant difference was found between the adjusted final means of Bhastrika Pranayama group and Ujjayi Pranayama group since difference between mean was lower than critical difference for adjusted means.

Analysis of Covariance of the Means of two Experimental Groups and the Control Group in Balance Ability Performance

	Groups			Sum of squares		df	Sum of squares	F- ratio
	Bhastrika Pranayam Group	Ujjai Pranayam Group	Control Group					
Pre-test Means	9.48	9.53	9.53	A	0.04	2	0.02	0.35
				W	5.33	87	0.06	
Pre-test Means	9.56	9.58	9.48	A	0.16	2	0.08	1.23
				W	5.76	87	0.06	
Adjusted Post-test Means	9.59	9.56	9.47	A	0.22	2	0.11	7.87*
				W	1.22	86	0.01	

*Significant at 0.05 level of significance, N=90, A=Among Means variance, W=Within Group variance. F-Ratio needed for significance at 0.05 level of significance = 3.10 (2, 87) and 3.10 (2, 86). The analysis of co-variance for Balance Ability performance indicated that the resultant F-ratio of 0.35 was insignificant in case of pre-test means from which it is clear that the pre-test means do not differ significantly and that the pre-test mean does not differ significantly and that the random assignment of subjects to the two experimental groups was quite successful. The post-test means of all the three groups yielded F-ratio of 1.23 which was insignificant at 0.05 level of confidence. The difference between the adjusted post means was found significant as the obtained F-ratio was 7.87. The F-ratio needed for significance at 0.05 level of confidence was 3.10. As the difference between the adjusted means for three groups was found significant, the critical difference for adjusted means was applied to find out which of the differences between the paired adjusted final means were not significant.

Paired Adjusted Final Means and Differences between Means for the two Experimental Groups and Control Group in Balance Ability Performance

Means			Difference between Means	Critical difference for adjusted Means
Bhastrika Pranayam Group	Ujjai Pranayam Group	Control Group		
9.59	9.56		0.30*	0.05
9.59		9.47	0.12*	0.05
	9.56	9.47	0.09*	0.05

*Significant at 0.05 level. It is evident from the above Table that significant difference was found between adjusted final mean of Bhastrika Pranayama group and control group; Ujjayi Pranayama group and control group since the difference between means was higher critical difference for adjusted means. On the other hand insignificant difference was found between the adjusted final means of Bhastrika Pranayama group and Ujjayi Pranayama group since difference between means was lower than critical difference for adjusted means.

Analysis of Co-Variance of the Means of Two Experimental Groups and the Control Group in Rhythmic Ability Performance

	Groups			Sum of squares		df	Sum of squares	F- ratio
	Bhastrika Pranayam Group	Ujjai Pranayam Group	Control Group					
Pre-test Means	1.42	1.51	1.52	A	0.16	2	0.08	1.97
				W	3.57	87	0.04	
Pre-test Means	1.44	1.55	1.52	A	0.17	2	0.08	2.19
				W	3.42	87	0.03	
Adjusted Post-test Means	1.50	1.53	1.48	A	0.02	2	0.014	4.05*
				W	0.03	86	0.004	

*Significant at 0.05 level of significance, N = 90, A = Among Means variance, W= Within Group variance, F-ratio needed for significance at 0.05 level of significance = 3.10 (2, 87) and 3.10 (2, 86). The analysis of co-variance for Rhythmic Ability performance indicated that the resultant F-ratio of 1.97 was insignificant in case of pre-test means from which it is clear that the pre-test means does not differ significantly and that the random assignment of subjects to the two experimental groups was quite successful. The post-test means of all the three groups yielded F-ratio of 2.19 which was insignificant at 0.05 level of confidence. The difference between the adjusted post means was found significant as obtained F-ratio was 4.05. The F-ratio needed for significance at 0.05 level of confidence was 3.10. As the difference between the adjusted means for three groups were found significant, the critical difference for adjusted means was applied to find out which of the difference between the paired adjusted final means were not significant.

Paired Adjusted Final Means and Differences between Means for the two Experimental Groups and Control Group in Rhythmic Ability Performance

Means			Difference between Means	Critical difference for adjusted Means
Bhastrika Pranayam Group	Ujjai Pranayam Group	Control Group		
1.50	1.53		0.03*	0.02
1.50		1.48	0.02*	0.02
	1.53	1.48	0.05*	0.02

*Significant at 0.05 level. It is evident from above Table that significant difference was found between adjusted final mean of Bhastrika Pranayama group and control group; Ujjayi Pranayama group and control group since the difference between means higher than critical difference for adjusted means.

Conclusion: The analysis of data revealed that the two experimental groups viz., Bhastrika Pranayama and Ujjayi Pranayama showed significant gains in performance of subjects in reaction ability, orientation ability, differentiation ability, balance ability and rhythmic ability after administration of Pranyama practices for a duration of 12 weeks. The control group did not show any significant increase in the performance of coordinative abilities under study.

REFERENCES

1. Shri Krishna, "Essence of Pranayama" (Mumbai: Jolly Offset Printing press. 1985) P. 49. | 2. Swami Kuvalayananda, Pranayama. (Pune: Kirloskar Press, 1983). | 3. His Holiness Swami Rama,., What is Yoga. (New Delhi: S. Newman and Company, 1976). | 4. Maharshi Mahes Yogi, Maharshi Mahesh Yogi on Bhagwad Gita : A New Translation and Commentary. (Baltimore, Maryland Penguin: Maharshi Press, 1971). |