Isolated And Combined Effect of Pranayama and Neuromuscular Breathing Exercise on Breath Hold Among Intercollege Men Handball Players

Dr.C. Lakshmanan[1], M. Santhi[2]
[1,2]*Tamil Nadu Physical Education and Sports University*

Abstract—**Purpose: The reason behind the investigation was to find out the isolated and combined effect of pranayama and neuromuscular breathing exercise on breath hold among college men intercollege men handball players.**

Methodology: For carryout the investigation, sixty (N=60) college men intercollege men handball players were randomly selected as subject those who were studying intercollege men handball players, affiliated to Madurai Kamaraj University, Tamil Nadu, India. The selected students were divided into four groups of fifteen students in each group randomly i.e., (n=15). Group-I fixed as the pranayama exercise group, Group-II fixed the neuromuscular breathing exercise group, Group-III fixed the Combined of pranayama and neuromuscular breathing exercise group and Group-IV was not involving any practice and act as Control group. The age of the students selected for investigation was 18 - 21 years. The training groups practice their training for six days per week for eight weeks. The dependent variables chosen for the investigation was Breath Holding Time. The selected students were tested before training and immediately after the training period on selected dependent variables. The data were statistically analyzed with dependent "t"-test and Analysis of covariance (ANCOVA). When the "F" ratio for adjusted post-test means was found significant, the Scheffe"s Post hoc test was applied to decide the paired mean differences. The levels of confidence were fixed at 0.05 levels.

Result: This investigation revealed that there was a significant improvement on Breath Holding Time after the isolated and combination effect of pranayama and neuromuscular breathing exercise and significant difference was found between the training groups on Breath Holding Time in favour of combination of pranayama and neuromuscular breathing exercise.

Index Terms—**Pranayama, Neuromuscular breathing exercise and Breath Holding Time**

I. INTRODUCTION

The modern world meets a traumatic change in all the aspects. Human meet a numerous problem especially in their health. Humans are facing physical problems, physiological problems and more level of mental problems. For the solutions for the problems individual need to involve any form of activities like sports, dancing, cycling, swimming, etc. During the covid-19-time people were facing lot of breathing problems. Based on this problem investigator try to identify the solution and create the awareness on breathing exercise among the young students.

Pranayama is the best form of breathing exercise in yoga. Yoga is the most valuable tradition of India. People should aware about all the yogic exercise, especially pranayama after the covid-19. Pranayama leads the breathing pattern to control the body. Bhastrika pranayama leads to boost the energy levels of human body. Kapalapathi is lead as the skull cleaning techniques. Nadi Shodhana pranayama helps to joining the right and left side of brain. Bhramari pranayama should help to calm the mind. Surya bedan pranayama is used to heat the body and Chandra bedan pranayama is used to cool the body. Overall pranayama exercises are improving the breathing of individual. Pranayama practicing can improve the function of the lungs; get reliefs from psychosomatic problems involving both the body and mind. Yogic practice and pranayama practice can provide overall well-being like physical, physiological, mental issues such as stress and anxiety.

Breathing comes under the function control by autonomic nerve system and is also able to the voluntary control. Breathing exercise is a form of exercise leads to improve the functions of the lungs.

Breathing exercise provide a healthy lung and the improved lungs functions. Neuromuscular breathing exercise involves the nerves and muscles which supported and strengthen the breathing passage, lungs and its walls. The techniques of neuromuscular breathing exercise are followed; gravity assisted position, place one hand on stomach and another hand on the stomach. Take a slow and deep breath focusing on diaphragm. Observe the movements of the hand while breathing. Then exhale slowly through nose, after that inhale again as continuous process. Breath hold is the form of measuring a lungs functioning. This is the very reliable and safe method of testing the individual respiratory function. A well-trained individual can hold their breath up to two minutes also. Mean value of breath hold attain below one minute in adults.

Independent Variables:

- Pranayama Training
- Neuromuscular breathing exercise Training
- Combined Training of pranayama and neuromuscular breathing exercise

Dependent Variables:

- Breath Holding Time

II. METHODOLOGY

The reason behind the investigation was to find out the isolated and combined effect of pranayama and neuromuscular breathing exercise on breath hold among intercollege men handball players. For carryout the investigation, sixty (N=60) intercollege men handball players were randomly selected as subject those who were studying intercollege men handball players, affiliated to Madurai Kamaraj University, Tamil Nadu, India. The selected students were divided into four groups of fifteen students in each group randomly i.e., (n=15). Group-I fixed as the pranayama exercise group, Group-II fixed the neuromuscular breathing exercise group, Group-III fixed the Combined of pranayama and neuromuscular breathing exercise group and Group-IV was not involving any practice and act as Control group. The age of the students selected for investigation was 18 - 21 years. The training groups practice their training for six days per week for eight weeks. The dependent variables chosen for the investigation was Breath Holding Time. The selected students were tested before training and immediately after the training period on selected dependent variables. The data were statistically analyzed with dependent "t"-test and Analysis of covariance (ANCOVA). When the "F" ratio for adjusted post-test means was found significant, the Scheffe‟s Post hoc test was applied to decide the paired mean differences. The levels of confidence were fixed at 0.05 levels.

III. RESULTS AND FINDINGS

Breath Holding Time

The analysis of dependent 't'-test of the collected score on Breath Holding Time of the students in the Pre-test and Post-test of pranayama training group, neuromuscular breathing exercise training group, combined pranayama training and neuromuscular breathing exercise training group and control group has been represented in the Table-1.

Table – 1. Mean And Dependent'T' Test for The Pre and Post Tests on Breath Holding Time

Mean	Pranayama Training Group – (I)	Neuromuscular breathing exercise Training Group – (II)	Combined Pranayama Training and Neuromuscular breathing exercise Training Group – (III)	Control Group -(IV)
Pre-test mean	29.13	29.20	28.53	28.93
Post-test mean	32.27	32.40	34.53	28.73
't'-test	2.24*	2.55*	3.95*	0.15

* Significant at 0.05 level.

(Table value required for significance at .05 level for 't'-test with df 14 is 2.15)

Table -1 shows that the pre-test mean on breath holding time of pranayama training group, neuromuscular breathing exercise training group, combined pranayama training and neuromuscular breathing exercise training group and control group were 29.13, 29.20, 28.53 and 28.93 respectively. The post-test mean was 32.27, 32.40, 34.53 and 28.73

respectively. The obtained dependent t-ratio values between the pre and post-test means on Breath Holding Time of pranayama training group, neuromuscular breathing exercise training group, combined pranayama training and neuromuscular breathing exercise training group and control group were 2.24, 2.55, 3.95 and 0.15 respectively.

The table value was required for significant differences with df 14 at 0.05 level was 2.15. It was concluded that training groups such as pranayama training group, neuromuscular breathing exercise training group and combined pranayama training and neuromuscular breathing exercise training group had reached the significant improvements in breath holding time.

The findings of the analysis of covariance (ANCOVA) of the pre, post and adjusted test scores of pranayama training group, neuromuscular breathing exercise training group, combined pranayama training and neuromuscular breathing exercise training group and control group on breath holding time were represented in Table – 2.

Table – 2. Analysis Of Covariance on Breath Holding Time

Test	Group – (I)	Group – (II)	Group – (III)	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	F ratio
Pre Test Mean	29.13	29.20	29.53	28.93	Between	2.80	3	0.93	0.13
					Within	400.80	56	7.16	
Post Test Mean	32.27	32.40	34.53	28.73	Between	259.78	3	86.59	12.33*
					Within	393.20	56	7.02	
Adjusted Post Test Mean	32.33	32.40	34.22	28.98	Between	213.09	3	71.03	100.04*
					Within	39.09	55	0.71	

* Significant at 0.05 level of confidence. (Breath Holding Time Scores in Seconds)

Table value for df (3, 56) at 0.05 level = 2.76 Table value for df (3, 55) at 0.05 level = 2.78

The table-2 shows the pre-test mean score on breath holding time of pranayama training group, neuromuscular breathing exercise training group, combined pranayama training and neuromuscular breathing exercise training group and control group were 29.13, 29.20, 28.53 and 28.93 respectively. The obtained 'F' ratio of 0.13 for pre-test scores was lesser than the table value of 2.76 for degrees of freedom 3 and 56 required for significant at 0.05 level of confidence on breath holding time.

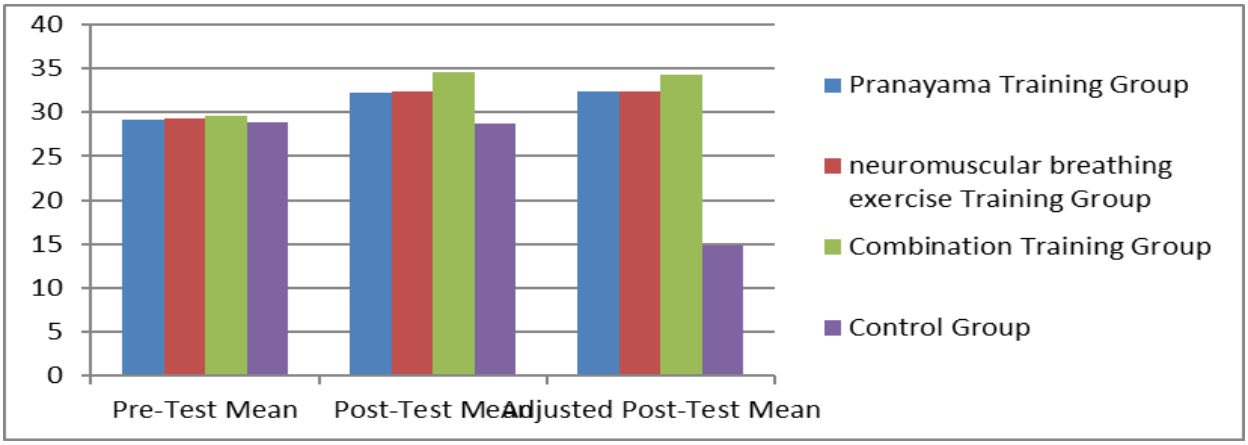
The post-test mean values on breath holding time of pranayama training group, neuromuscular breathing exercise training group, Combined pranayama training and neuromuscular breathing exercise training group and control group were 32.27, 32.40, 34.53 and 28.73 respectively. The obtain 'F' ratio of 12.33 for post-test score was greater than the table value of 2.76 for degrees of freedom 3 and 56 required for significant at 0.05 level of confidence on breath hold.

The adjusted post-test mean value on breath holding time of pranayama training group, neuromuscular breathing exercise training group, combined pranayama training and neuromuscular breathing exercise training group and control group were 32.33, 32.40, 34.22 and 28.98 respectively. The obtain 'F' ratio of 100.04 for adjusted post-test score was greater than the table value of 2.78 for degrees of freedom 3 and 55 required for significant at 0.05 level of confidence on breath hold.

The results of the investigation indicates that there were significant differences among the adjusted post-test mean value of pranayama training group, neuromuscular breathing exercise training group, combined pranayama training and neuromuscular breathing exercise training group and control group on breath hold.

The above data also revealed that combined pranayama training and neuromuscular breathing exercise training group had show better performance than pranayama training group, neuromuscular breathing exercise training group and control group on breath hold.

The pre-test, post-test and adjusted post mean values of pranayama training group, neuromuscular breathing exercise training group, combined pranayama training and neuromuscular breathing exercise training group and control group on breath holding time were graphically represented in the Figure -1.



The Pre-Test, Post-Test and Adjusted Post Test Mean Values of Pranayama Training Group, Neuromuscular Breathing Exercise Training Group, Combined Pranayama Training and Euromuscular Breathing Exercise Training Group and Control Group on Breath Holding Time In Seconds

IV. CONCLUSIONS:

From the result, the following conclusions were drawn. The result of the investigation revealed that there was a significant development on breath hold after the isolated and combination of pranayama and neuromuscular breathing exercise training and significant change were found between the training groups on breath hold in favour of combination of pranayama and neuromuscular breathing exercise training.

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