

# INFLUENCE OF BREATHING EXERCISES ON RELATED PHYSIOLOGICAL VARIABLES CONCERNING LONG DISTANCE RUNNERS

**Dr. Suma Joseph**

Associate Professor, Mount Carmel College of Teacher Education,  
Kottayam, Kerala 686004 India.

## **ABSTRACT**

*The purpose of the study was to find out the influence of breathing exercises on related physiological variables concerning long distance runners. To achieve the purpose of the present study, men long distance runners from city colleges, Chennai were selected as subjects randomly whose age ranged between 21 and 25 years. The subjects were divided into two groups of fifteen each. Group I acted as experimental group with breathing exercises, Group II acted as (control group). Pre tests were conducted for all the 30 subjects on selected physiological variables such as resting pulse rate, vital capacity, systolic blood pressure and diastolic blood pressure. Post test was conducted after six weeks of training. Pre-test and Post-test data were analyzed by applying ANCOVA. The level of confidence was fixed at 0.05. The training effects of breathing exercise workouts demonstrated significant influence over the physiological related variables among men long distance runners.*

**Keywords: Breathing Exercises and Long-Distance Runners**

## **INTRODUCTION**

Breathing techniques and patterns are regularly advocated for relaxation, stress management, control of psycho physiological states and to improve organ function (Ritz and Roth, 2003). Anatomically speaking there is a favorable equilibrium (balance in breathing pressures) with breathing, which can be easily disrupted by fatigue or prolonged sympathetic (excitatory) nervous system arousal as seen with stress. One therapeutic goal of breathing exercises is that it may reduce or alleviate some of the chronic negative effects of stress. This stress relief is one reason that breathing, or pranayama as it is called in yoga, is very central to yoga practices. This article will endeavor to explain the physiological mechanisms of breathing, as well as many of the research driven applications utilized with breathing. Fitness professionals and personal trainers will become more aware of the truths and myths of breathing, and related conditions, so that they can better guide and teach their students and clients.

In order to keep living our cells need the oxygen, available in the air. Each breathing cycle is made of two steps: inhalation, when the air gets into the body full of oxygen, and exhalation, when the air gets out of the body full of carbon dioxide produced through our metabolic process. The air we breathe gets out of our body with an average rate of 13/16 cycles per minute. The alternation between inhalation and exhalation is controlled by the respiratory center that is located in the medulla oblongata at the base of the skull.

## **HYPOTHESIS**

It was hypothesized that there would be significant improvement on related physiological variables due to the influence of breathing exercises among men long distance runners.

## METHODS & MATERIALS

The purpose of the study was to find out the influence of breathing exercises on related physiological variables concerning long distance runners. To achieve the purpose of the present study, men long distance runners from city colleges, Chennai were selected as subjects randomly whose age ranged between 21 and 25 years. The subjects were divided into two groups of fifteen each. Group I acted as experimental group who practiced breathing exercises, Group II acted as (control group). Pre tests were conducted for all the 30 subjects on selected physiological variables. After the experimental period of six weeks post-test were conducted and the scores were recorded. The subjects were given respective training six days a week (Monday to Saturday).

### TRAINING PROGRAMME

The following breathing exercises were given to the men distance runners before the start of their training.

**Table 1: Six Weeks Training Schedule on Breathing Exercises Monday to Saturday (Sunday will be rest)**

Sl.No	Training	Duration (Minutes)	Sets	Rest Between / Sets	Total (Minutes)
1	Bhastrika Pranayama or deep and slow breathing exercise	1	3	1	5
2	Anulom Vilom Pranayama or alternate nostril breathing exercise	1	3	1	5
3	Sitali Pranayama or cooling breath	1	3	1	5
4	Ujjayi Pranayama or ocean breath	1	3	1	5
5	Kapalabhati Pranayama	1	3	1	5
6	Bhramari Pranayama or breathing with humming sound	1	3	1	5
7	Udgeet Pranayama	1	3	1	5
<b>TOTAL</b>					<b>35</b>

**Table2: Showing the Variables, Tests / Tools and the Unit of Measurement**

Sl.No	Variables	Tests/Equipment	Units
1	Resting Pulse Rate	Radial artery palpitation Manual Method	In Beats/Minute
2	Vital Capacity	Spirometer	In litres
3	Systolic Blood Pressure	Sphygmomanometers	In mm hg
4	Diastolic Blood Pressure		

## ANALYSIS AND INTERPRETATION

The following statistical techniques were used to find out the influence of breathing exercises on physiological variables concerning men long distance runners.

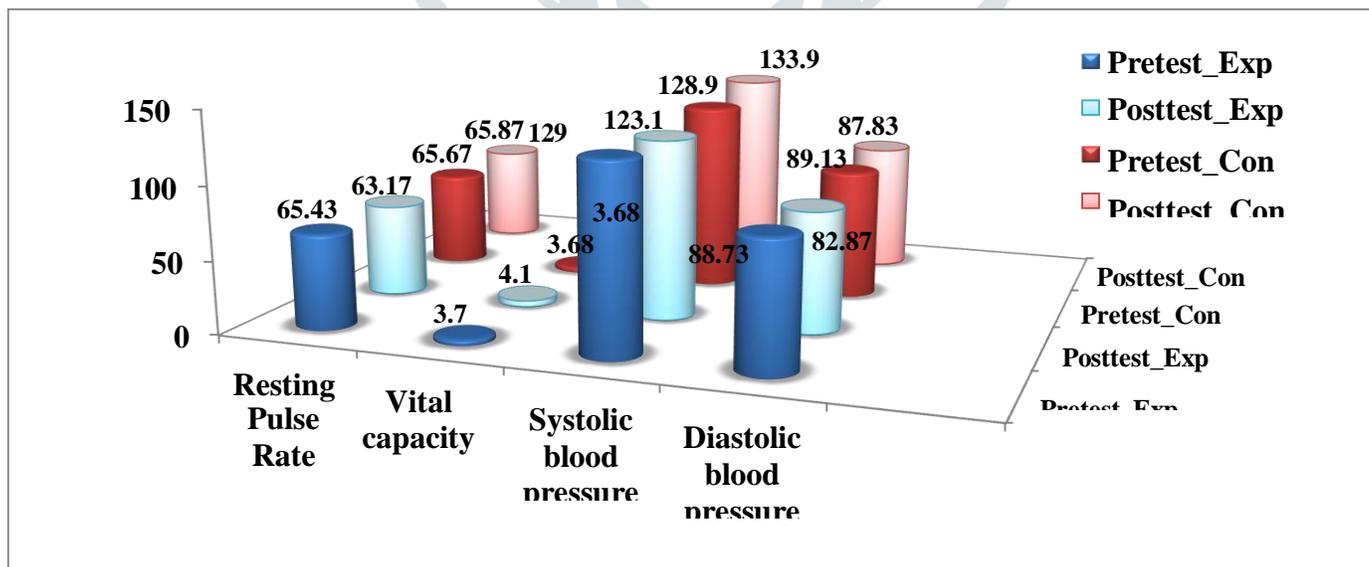
For the purpose of finding out any significant change in the variables due to training the data collected were analyzed statistically using SPSS statistical package. Means of group were tested for significance using ANCOVA. The level of confidence was fixed at 0.05 level

**Table 3: Computation of Paired samples t-test on Physiological Variables**

Variables	Mean	Experimental Group I (Breathing)	Control Group II	Sources of Variance	Type I Sum of Squares	df	Mean Square	F
Resting Pulse Rate	Pre-test	65.43	65.67	Between	187.89	1	187.89	186.85*
	Post-test	63.17	65.87	Within	27.15	27	1.01	
Vital capacity	Pre-test	3.70	3.68	Between	1.25	1	1.25	219.24*
	Post-test	4.10	3.68	Within	0.15	27	0.01	
Systolic blood pressure	Pre-test	129	128.9	Between	872.90	1	872.90	3.63
	Post-test	123.1	133.9	Within	6493.75	27	240.51	
Diastolic blood pressure	Pre-test	88.73	89.13	Between	159.05	1	159.05	55.72*
	Post-test	82.87	87.83	Within	77.08	27	2.855	

\*Significant at 0.05 level with 1, 27 df (4.210)

The results presented in Table 3 showed that the obtained F value of Resting pulse rate (186.85), Vital capacity (219.24) and Diastolic blood pressure (55.72) was greater than the required table value of 4.210. Hence, it was proved that there was significant improvement in resting pulse rate, vital capacity and diastolic blood pressure due to varied breathing exercises among men long distance runners. The obtained F value of 3.63 of systolic blood pressure was lesser than the required table value of 4.210 and found to be optimal.



**Figure 1: Showing means of physiological variables due to breathing exercises among men Long distance runners**

## MAJOR FINDINGS OF THE STUDY

- There was an improvement on the resting pulse rate of men long distance runners due to the six weeks of varied breathing exercises.
- There was an improvement on the vital capacity of men long distance runners due to the six weeks of varied breathing exercises.
- There was an improvement on the diastolic blood pressure of men long-distance runners due to the six weeks of varied breathing exercises.
- Due to six weeks of breathing exercises systolic blood pressure of long-distance runners were found to be optimal.

## CONCLUSIONS

The training in breathing exercises was found to be an effective means of enhancing the pulmonary functions and physiological variables such as resting pulse rate, vital capacity and diastolic blood pressure however diastolic blood pressure of men long distance runners were found to be optimal. . The study is in relation to the study conducted by Raghavendra Manjunath (2017) who proved that breath regulation is considered as an essential exercise to influence the physiological systems of the human body.

## REFERENCES

1. Chakrabarty A.S. Kaveri. Chakrabarty, (2007), Fundamentals of Respiratory Physiology, I. K. International Pvt Ltd. p.29.
2. Duncan MacDougall, Digby Sale, (2014), The Physiology of Training for High Performance, Oxford University Press, p.83.
3. Elaine N. Marieb, (2006), Human Anatomy & Physiology, Pearson Education India. Sengupta. P. Health impacts of yoga and pranayama: a state-of-the-art review Int J. Prev Med, 3 (2012), pp. 444-458
4. RaghavendraManjunath(2017) Effects of yogic breath regulation: A narrative review of scientific evidence, Journal of Ayurveda and Integrative Medicine.
5. Ritz and Roth, (2003) Behavioral interventions in asthma. Breathing training. Sage Journals2003 Oct; vol. 27 issue (5):710-30.