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Effect of Selected Micro and Macro Yogic Exercises on Respiratory and Breathing Holding Capacity of School Going Children

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Abstract

Objective: The objective of the study was to investigate the effect of selected micro and macro yogic exercises on respiratory variables of school going children. **Methods:** A total of 75 students was selected. Twenty five subjects were selected for each group. Micro Yoga Exercise group, MacroYoga Exercise group & Control group. Results: significant difference was found in case of Micro Exercise and macro exercise group, micro and control group, macro and control group. Significant difference was found in case of Micro Yogic Exercises group and control group. There was also a significant difference between macro yogic exercises group and control group in relation to positive breath holding capacity. **Conclusions**: Micro Yogic Exercises are more effective to improve resting breath holding capacity and positive breath holding capacity.

Key Words: Yogic, micro, macro , breath holding capacity etc

INTRODUCTION

Yoga is a very ancient discipline. It is recognized as one of the most important and valuable heritage of India. Yoga is an art, science and philosophy, which influence the life of man at each level. Yoga is a way to achieve total health, peace, bliss and wisdom. Physical, mental and spiritual aspects of yoga help to make one's life purposeful, useful and noble.

Today, the whole world is looking to yoga for the answer to various problems modern man is facing. Yoga is the art of living and yogasana is a scientific procedure. Yoga develops the personality of an individual, physically, mentally, morally and intellectually.

Yoga is a unique Indian tradition of ancient origin for health and happiness. It imparts both sound body and sound mind to the practitioner. Yoga is a Sanskrit term. It represents Yoke, which symbolically means to join or to unite. Yoga is intended for union or harmony of mind and the body. Yoga is the science of physical and mental health. It synchronizes the functions of the muscle and the mind. It is the only path that can lead to holistic health.(Batch, 1987)

Yoga eliminates stress and strain which improves physical and mental fitness. Physical fitness prepares the body to perform strenuous activity without getting fatigue. Mental fitness prepares the mind to face tough task and challenges(Lawrence, 1982)

Yoga benefits people of all ages. The study of yoga is fascinating to those with a philosophical mind and is defined as the "silencing of the mind's activities which leads to complete realization of the intrinsic nature of the Supreme Being"(Ross, 1993).

Yogic exercises and techniques have significant, direct effects on the physical, psychological, theoretical preparation and on the regeneration of the strength process. Yogasanas can be used for warm-up, cool-down, regeneration, synthesis of mind and body, activation or deactivation of the body and as supplemental exercises.(Kogler, 2003)

In recent times yoga has become integral part of physical education as a micro exercise. Athletes and sportsman are mentally prepared and physically warmed up by yogic techniques to improve their efficiency in their performance in the play ground. Thus, the purpose of the study was to investigate the effect of selected micro and macro yogic exercises on respiratory variables of school going children.

Methods: The subjects for this study was the S.B. Siksha Niketan inter college karundi sundarpur Varanasi be selected from the schools. A total of 75 students were selected. Twenty five subjects was selected for each group.Micro Yoga Exercise group, Macro Yoga Exercise group & Control group.

Selection of Variables: Resting Respiratory Rate, Positive Breath Holding Capacity, Negative Breath Holding Capacity was selected for the present study. Resting Respiratory Rate was measured by using Manual Method and the score was recorded in Numbers/min. Resting Respiratory Rate was measured by using Manual Method and the score was recorded in Numbers/min. (Positive B.H. capacity) was measured by using (Negative B.H. capacity) was measured by using Manual Method and the score was recorded in Seconds**.** Pre test-post test Randomized groups design was used for the study. In the pre test post test randomized groups design, the groups are randomly formed, but all groups are given a pre test as well as post test.

Statistical Technique for Analysis of Data: The data was analysed by applying Analysis of Co-Variance (ANCOVA) Technique to find out the effect of of micro and macro exercises on Respiratory rate and breathing holding capacity of school children, Varanasi. The level of significance was set at 0.05.

RESULTS: The results pertaining to mean, standard deviation and analysis of co-variance between experimental group and control group for pre test -post test respectively have been presented in table No.1 to 4.

Table 1 Analysis of Co-variance of the Means of Two Experimental Groups and One Control Group in Resting Respiratory Rate

Tests	Mean								
	Micro Training	Macro Training	Control	SOV	SOS	df	MSS	F-ratio	η^2
Pre	20.320	20.840	20.720	A	3.707	2	1.853	0.274 (0.761)	0.754
				W	487.840	72	6.776		
				Total	491.547	74			
Post	33.720	23.840	21.400	A	2127.920	2	1063.960	79.105 (0.000)	68.724
				W	968.400	72	13.450		
				Total	3096.320	74			
Adjusted	34.059	23.604	21.297	A	2297.661	2	1148.831	219.272 (0.000)	4.174
				W	371.991	71	5.239		

Post test				**Corrected Total**	55052.000	75			
Gain/Loss% (pre-post)	65.945	14.395	3.282						

SoV- Source of variance, SoS – sum of square, df- degree of freedom, MSS - mean sum of square, η^{2-} effect size, * Significant at 0.05 level of significance, A = Among Means variance, W = Within Group variance, F = Ratio needed for significance at 0.05 level of significance = df (2,72) = 2.70, df (2, 71) = 2.70

In pre test a statistically insignificant difference was found among the two type of training on the Resting Respiratory Rate, F (2, 72) = 0.274 , p =0.761 with an effect size of «Pre_eta %. Table-1 Shows that the mean score in Resting Respiratory Rate20.320 for micro training , 20.320 for macro training, 20.320 for in control groups. This shows that at initial level the groups were similar in nature. Likewise, in posttest there were significant mean differences on the mean score of Resting Respiratory Rate between the groups, F (2, 72) = 79.105, p =79.105 with an effect size of 79.105%. Further, there was a significant difference of type of training on the adjusted mean score of Resting Respiratory Rate of the subjects after controlling the effect of pretest score,F (2,71) =219.272, p =.0.000 with an effect size of 4.174%.

Table 2Mean Comparison of Micro and Macro group in relation to Resting Respiratory Rate

(I) GROUPS	(J) GROUPS	Mean Difference (I-J)	Sig.[b]
Micro Exercise Group	Macro Exercise Grup	10.455*	.000
	CONTROL GROUP	12.762*	.000
Macro Exercise Grup	Micro Exercise Group	-10.455*	.000
	CONTROL GROUP	2.307*	.002

The above table reveals that significant difference was found in case of Micro Exercise and macro exercise group, micro and control group, macro and control group.

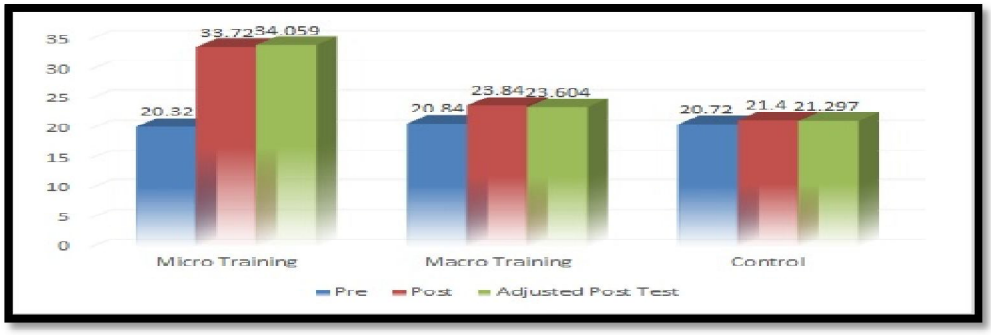

Figure 1Graphical Representation of the means of Micro Training, Macro Training and Control Group in relation to Resting Respiratory Rate

Table 3Analysis of Co-variance of the Means of Two Experimental Groups and One Control Group in Postive Breath Holidng Capacity

Tests	Mean								
	Micro Training	**Macro Training**	**Control**	**SOV**	**SOS**	**df**	**MSS**	**F-ratio**	**η^2**
Pre	64.320	68.480	70.440	**A**	488.347	2	244.173	1.500 (0.230)	4.001
				W	11717.840	72	162.748		
				Total	12206.187	74			
Post	67.960	71.560	71.080	**A**	191.040	2	95.520	0.627 (0.537)	1.713
				W	10960.960	72	152.236		
				Total	11152.000	74			
Adjusted Post test	71.246	70.857	68.497	**A**	107.624	2	53.812	20.800 (0.000)	0.028
				W	183.688	71	2.587		
				Corrected Total	380755.000	75			
Gain/Loss% (pre-post)	5.659	4.498	0.909						

SoV- Source of variance, SoS – sum of square, df- degree of freedom, MSS - mean sum of square, η^2- effect size, * Significant at 0.05 level of significance, A = Among Means variance, W = Within Group variance, F = Ratio needed for significance at 0.05 level of significance = df (2,72) = 2.70, df (2, 71) = 2.70

In pre test a statistically insignificant difference was found among the two type of training on the Postive Breath Holidng Capacity, F (2, 72) = 1.500 , p =0.230 with an effect size of «Pre_eta %. Table-1 Shows that the mean score in Postive Breath Holidng Capacity64.320 for micro training , 64.320 for macro training, 64.320 for in control groups. This shows that at initial level the groups were similar in nature. Likewise, in posttest there were insignificant mean differences on the mean score of Postive Breath Holidng Capacity between the groups, F (2, 72) = 0.627, p =0.627 with an effect size of 0.627%. Further, there was a significant difference of type of training on the adjusted mean score of Postive Breath Holidng Capacity of the subjects after controlling the effect of pretest score,F (2,71) =20.800, p =.0.000 with an effect size of 0.028%.

Table 4Mean Comparison of Micro and Macro group in relation to Positive Breath Holding Capacity

(I) GROUPS	(J) GROUPS	Mean Difference (I-J)	Sig.[b]
Micro Exercise Group	Macro Exercise Grup	.390	1.000
	CONTROL GROUP	2.749*	.000
Macro Exercise Grup	Control Group	2.360*	.000

The above table reveals that significant difference was found in case of Micro Yogic Exercises group and control group. There was also a significant difference between macro yogic exercises group and control group.

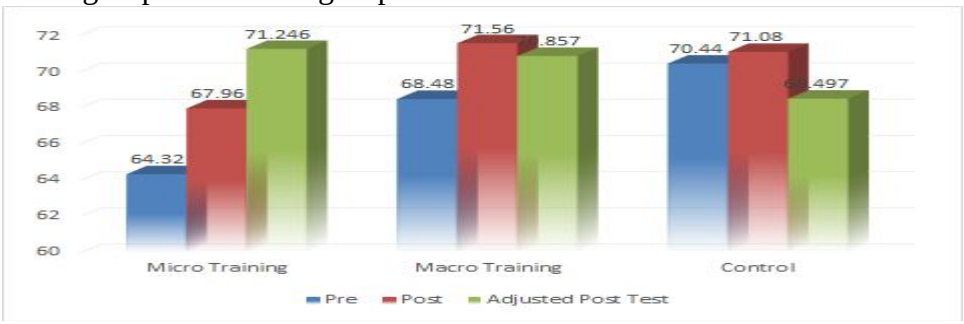

Figure 2Graphical Representation of the means of Micro Training, Macro Training and Control Group in relation to Positive Breath Holding Capacity

Discussion of Findings:

In the present study the observed mean of Resting Respiratory Rate was more than the normal breathing rate. Shaer (1981) mentioned that the normal human being has 12-20 respirations per minute in resting condition. Moreover, during exercise, the respiratory rate may go up to a value of 50-60 breaths per minute. The lower Resting Respiratory Rate observed in this study might be due to the reason that the particiapnts(subjects) participated in strenuous physical programmes, as a result of which changes have occurred in lung volume, oxygen diffusion in the lungs, Vital Capacity, Oxygen intake leading to better oxygen utilization at a lower rate of supply. Moreover, the muscles used for inspiration, like the diaphragm, external and internal intercostals, scalene, strenocleidomastoid, extensor muscle, abdominal of the back and trapezius muscle, gets strengthened, as a result of which the maximum amount of air can be inspired /expired by using less effort. During exercise, the working muscles require a larger amount of oxygen but if there is lack of oxygen in the blood, and the arterial oxygen falls too low, then they are stimulated to send impulses to the medulla, where respiratory centers are stimulated to increase the rate and depth of breathing to fulfill the oxygen demand.

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