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EFFECT OF SWIMMING TRAINING ON MAXIMUM BREATH HOLDING TIME OF BEGINNER SWIMMERS

Yogesh S. Nirmal
Assistant Professor , D.C.P.E., Amravati (M.S.)

ABSTRACT

Background: Every training program has its own effects on the physiological functioning; the present study would serve in to know about these effects in depth. Keep in mind researcher investigated the effect of swimming Training on Maximum Breath Holding Time of beginner swimmers. Materials and Methods: For achieving the purpose of this study total 50 male beginner swimmers were selected as subject from H.V.P.Mandal's Amravati, Maharashtra. Their age was ranging from 12 to 15 years, Maximum Breath Holding Time was measured by using Stop Watch and Nose Clip and the higher of the two breath holding times was recorded in seconds as the score. All the selected subjects were divided in to two groups. Only experimental group underwent swimming Training for 48 weeks. Pre Mid and Post tests were applied for both the groups to find out the significant effect of swimming training on Maximum Breath Holding Time. Result: The data were analyzed through't'-test and ANOVA statistical techniques. The statistical findings revealed that experimental group significantly improved Maximum Breath Holding Time through swimming training. Conclusions: The experimental group has shown significant improvement in Maximum Breath Holding Capacity after 24 weeks as well as 48 weeks of swimming training, whereas no significant improvement has been shown in Control group.

KEYWORDS : *Swimming Training , Materials and Methods , training programme .*

INTRODUCTION

Every exceptional accomplishment achieved in the performance of any swimmer is the cumulative result of so many and so varied associated factors. All these factors contribute to the success of any swimmer during the competition. The organization of a training programme is one of the most crucial factors that decide the level of performance displayed by the swimmer. The training programme is comprised keeping in mind so many associated aspects. These aspects include Physical, Physiological, Biomechanical, Psychological and Social factors. It is of paramount importance to study the effects of swimming training on such aspects, which ultimately contribute to the performance of the swimmers. To accomplish this task, the researcher undertook the study entitled, "Effect of

Swimming Training on Maximum Breath Holding Time of Beginner Swimmer"

SIGNIFICANCE OF THE STUDY

The present study would be significant to get an idea about the Maximum Breath Holding Time of beginner swimmer. Every training program has its own effects on the physiological functioning; the present study would serve in to know about these effects in depth. The result of the study would indicate the effect of swimming training on Maximum Breath Holding Time of school going boys.

The findings of the study would throw light on the effect of different duration of swimming training for the better result as well as physiological adaptation among adolescent boys.

HYPOTHESIS

In the beginning of the study, it was hypothesized that there would be significant effect of swimming training on Maximum Breath Holding Time of beginner swimmer. It was further hypothesised that there would be significant difference between the effect of 24 weeks and 48 weeks of training on the selected dependent variables.

Maximum Breath Holding Time (Operational Definitions of the Term):

Maximum breath holding time has been defined as an individual's ability to hold the breath after a voluntary forced maximal inhalation, without inhaling or exhaling during the period of holding the breath or the maximum duration of holding breath after the full inhalation.

METHODOLOGY

The school going male swimmers who used to come for regular Training at Hanuman Vyayam Prasarak Mandal's swimming pool, Amravati served as the sources of data. Total 50 beginner male swimmers were selected by employing purposive sampling method, who had the ability to swim at least 500 meters in any survival stroke. The average age of the subjects were thirteen (13) years, ranging between 13 to 15 years. Their age was verified from the school admission register. The subjects were divided randomly into two groups viz. Experimental group and Control group; each group consisted of twenty five subjects.

COLLECTION OF DATA

The data on Maximum Breath Holding Time was collected at different stages of the experiment. The data were collected prior to the start of the experiment (pre-test), at the end of 6 months (24 weeks) training period (mid-test) and immediately after 12 months (48 weeks) of training period (post-test) by using wet spirometer on both the selected groups i.e. Experimental and Control groups, and it was recorded in milliliter.

ANALYSIS OF THE DATA

To determine the significance of difference between the means of the Control and Experimental groups, independent t-test was employed for Pre-test, Mid-test and Post-test separately for each variable. The data were further analysed by applying One Way Analysis of Variance (ANOVA) in order to determine the significant difference among the groups for each selected dependent variables. When the difference was found to be significant, the LSD Post Hoc Test was applied to assess the significance of difference between the paired means of the selected variables for the Pre, Mid and Post-test of Control and Experimental groups. All the data were analysed by using (SPSS) Statistical Package for

Social Sciences. To test the hypothesis the level of significance was set at 0.05, and it has given in the following tables.

Table - 13
MEAN, STANDARD DEVIATION AND t-RATIO FOR THE PRE, MID AND POST- TEST OF CONTROL AND EXPERIMENTA GROUPS IN MAXIMUM BREATH HOLDING TIME

Test	Group	Mean	Standard Deviation	Mean Difference	Standard Error	t-ratio
Pre-test	Control	33.365	2.048	0.110	0.644	0.171@
	Experimental	33.254	2.485			
Mid-test	Control	34.287	2.233	1.193	0.689	1.731@
	Experimental	35.480	2.624			
Post-test	Control	34.726	2.762	2.475	0.730	3.389*
	Experimental	37.201	2.388			

@ Not significant at 0.05 level Tabulated t0.05(48) = 2.0106
* Significant at 0.05 level

From the above Table-13 it is evident that there is significant difference in between Post-test means of Control and Experimental group in Maximum Breath Holding Time as the calculated t-value of 3.389 is higher than the tabulated t-value of 2.0106 at 0.05 level of confidence for the 48 degrees of freedom. This table also indicates that the obtained t-values of 0.171 and 1.731 for the Pre-test means and Mid-test means of Control and Experimental group in Maximum Breath Holding Time respectively do not show significant difference, because both the obtained values are less than the tabulated t-value of 2.0106 at 0.05 level of confidence for the 48 degrees of freedom. The mean values of Maximum Breath Holding Time are graphically depicted in Figure-7.

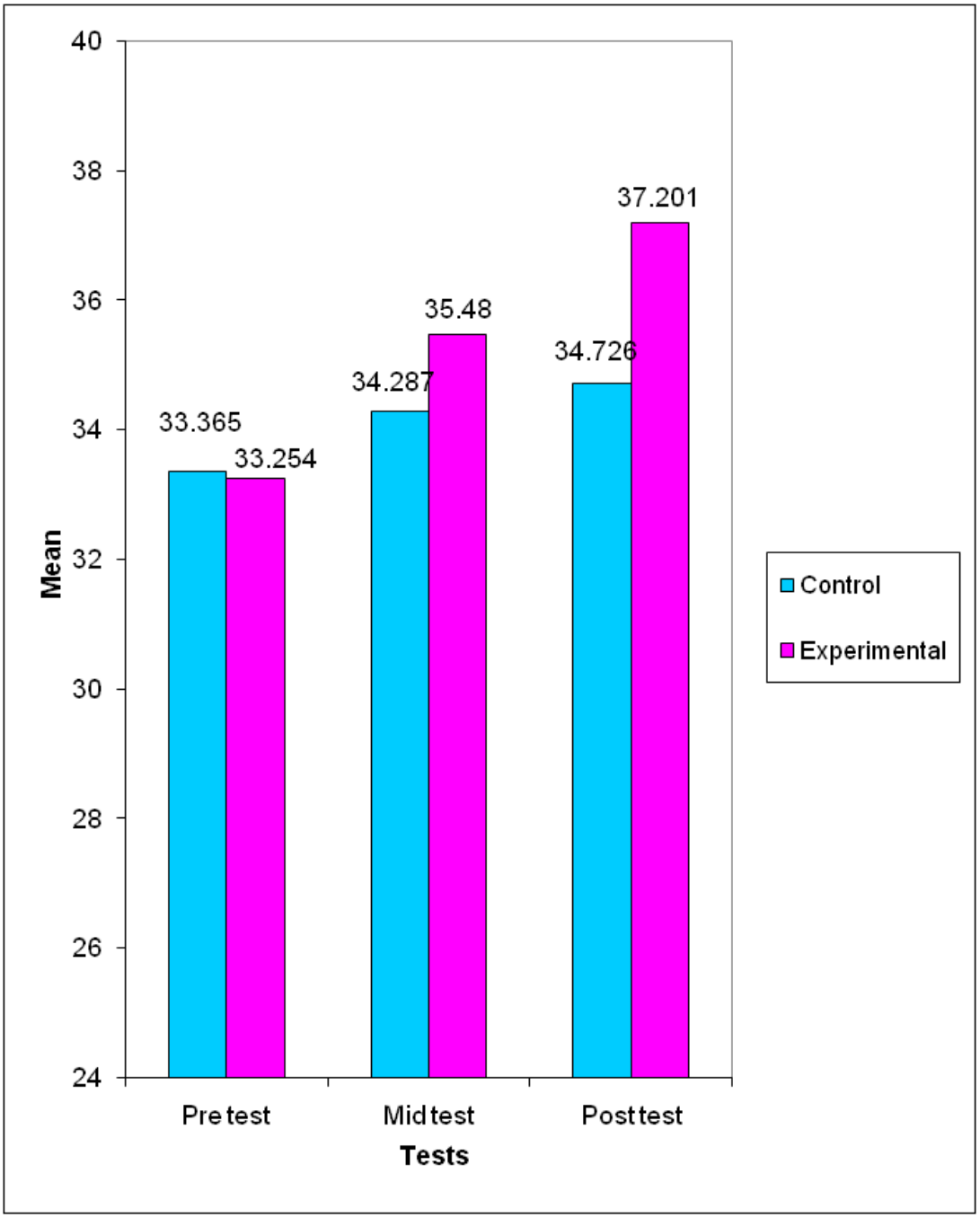

Figure - 7
Comparison of Means Among the Pre, Mid and Post-Test of Control and Experimental Groups in Maximum Breath Holding Time

Table - 14

SUMMARY OF ONE WAY ANALYSIS OF VARIANCE FOR THE DATA ON MAXIMUM BREATH HOLDING TIME OF PRE, MID AND POST-TEST OF CONTROL GROUP

Source of Variance	Degree of Freedom	Sum of Square	Mean Sum of Square	F-ratio
Between the Groups	K-1 3 – 1 = 2	24.123	12.062	2.152@
With in Group	N – K 75 – 3 = 72	403.626	5.606	

@ Not Significant at 0.05 level Tabulated F0.05 (2, 72)= 3.123

Findings of Table-14 reveal that there is no significant difference among the Pre, Mid and Post-test of Control group in Maximum Breath Holding Time, because the calculated F-ratio of 2.152 is less than the tabulated value of 3.123 at 0.05 level for 2/72 degrees of freedom.

Since the obtained F-ratio was found to be insignificant, Least Significant Difference (LSD) Post Hoc Test was not applied to determine the paired Mean Difference Among the three tests' mean scores.

Table - 15

SUMMARY OF ONE WAY ANALYSIS OF VARIANCE FOR THE DATA ON MAXIMUM BREATH HOLDING TIME OF PRE, MID AND POST-TEST OF EXPERIMENTAL GROUP

Source of Variance	Degree of Freedom	Sum of Square	Mean Sum of Square	F-ratio
Between the Groups	K - 1 3 – 1 = 2	195.738	97.869	15.647*
With in Group	N – K 75 – 3 = 72	450.346	6.255	

* Significant at 0.05 level Tabulated F0.05 (2, 72)= 3.123

It is learnt from the above Table-15 that there is significant difference among the Pre, Mid and Post-test of Experimental group in Maximum Breath Holding Time, as the obtained F-value of 15.647 is quite higher than the Tabulated F-value of 3.123 needed to be significant at 0.05 level of confidence for the 2/72 degrees of freedom.

Since the obtained F-ratio was found to be significant, to determine the paired mean difference, Least Significant Difference (LSD) Post Hoc Test was employed. The paired mean difference is shown in Table-16.

Table - 16

PAIRED MEAN DIFFERENCE FOR THE DATA ON MAXIMUM BREATH HOLDING TIME OF PRE, MID AND POST-TEST OF EXPERIMENTAL GROUP

Mean			Mean Difference	Critical Difference
Pre-test	Mid-test	Post-test		
33.254		37.201	3.946*	1.410
33.254	35.480		2.226*	1.410
	35.480	37.201	1.721*	1.410

* Significant at 0.05 level of confidence

It is evident from Table-16 that the mean difference between Pre and Post-test is 3.946, Pre and Mid-test is 2.226, Mid and Post-test is 1.721 are greater than the Critical Difference value of 1.410. Hence significant difference is found in between Pre, Mid and Post-test of Experimental group in Maximum Breath Holding Time. The differences of means are graphically shown in Figure-8.

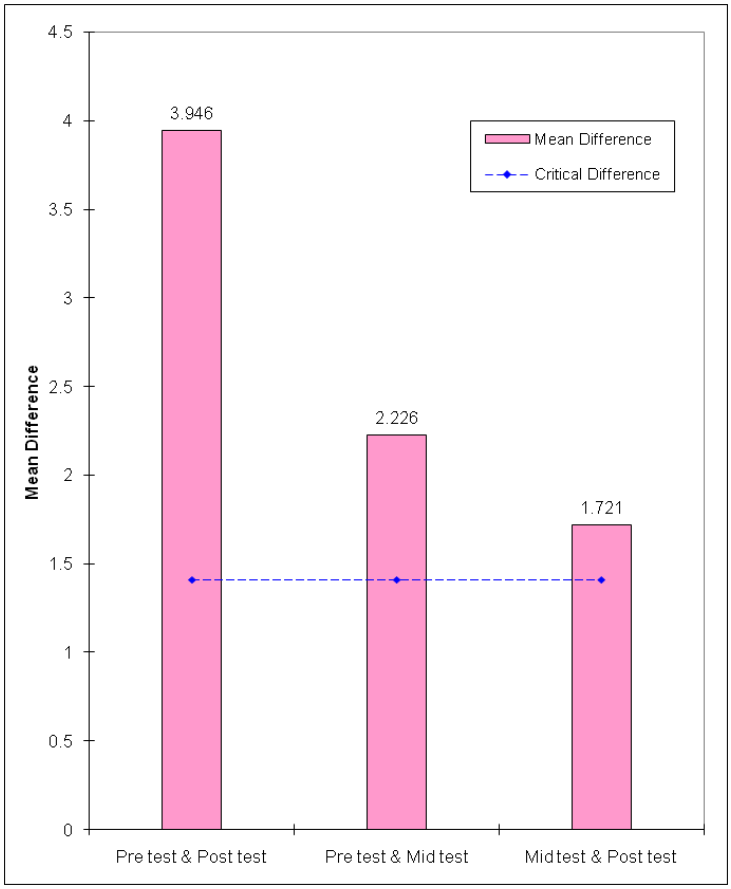

Figure - 8

Comparison of Mean Differences Among the Pre, Mid and Post-Test of Experimental Group in Maximum Breath Holding Time Along with Critical Difference

DISCUSSION ON FINDINGS:

The findings of statistical analysis revealed that significant improvement was found in the Maximum Breath Holding Time of the selected subjects of Experimental group due to 12 months of swimming training programme. The reasons behind this improvement may be attributed to the nature of experimental treatment i.e. systematic progressive swimming training. It is a matter of fact that in swimming, the load of the water pressure against the chest wall and elevated airway resistance as the result of immersion could comprise a conditioning stimulus as well as the requirement that inspirations must occur rapidly from functional residual capacity during short intervals between strokes.

It is also a known fact that swimming engages practically all muscle groups. Hence, O2 utilization for the muscle is higher in swimmers. Therefore regular systematic swimming might have produced the maximum effect on the functions of heart and lungs by increasing hypertrophy of cardiac muscles, stroke volume, cardiac out-put, hemoglobin content, transportation of blood, elasticity of the chest, thoracic mobility, vital capacity and Maximum Breath Holding Time due to development of broad chest and long trunk and pulmonary capacity by enhancing the strength and efficient functions of diaphragm, external and internal intercostal muscles with the selected subjects of Experimental group. Hence such results occur in this study

CONCLUSIONS:

Within the limitations of the present study and based on the findings, the following conclusions are drawn-

1.The experimental group has shown significant improvement in Maximum Breath Holding Capacity after 24 weeks as well as 48 weeks of swimming training, whereas no significant improvement has been shown in Control group.

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