



ORIGINAL RESEARCH PAPER

Physical Education

EFFECT OF VARIED AEROBIC TRAINING PROGRAMME ON SELECTED PHYSIOLOGICAL VARIABLES BETWEEN TRIBAL AND NON TRIBAL ADOLESCENT BOYS

KEY WORDS: Aerobic Training, Resting Heart rate, Resting Systolic Blood Pressure, Resting Diastolic Blood Pressure and Body Fat Percentage.

Ashis Kumar Mondal

Research scholar Bharathiar University, Coimbatore-641046

Dr. Amit Banerjee*

Assistant Professor, Post Graduate Government Institute for Physical Education. Banipur, West Bengal. *Corresponding Author

ABSTRACT

The aim of the study was to investigate the comparative effect of varied aerobic training programme on selected Physiological variables namely Resting heart rate, Resting Systolic blood pressure, resting Diastolic blood pressure and Body fat percentage of Tribal and Non-Tribal adolescent school boys. For the purpose of the study 120 students each in tribal and non-tribal category were selected total 240 subjects (120 tribal and 120 non-tribals). The age group of the subjects was ranged from 14-16 years. They were selected randomly. The subjects were further sub-divided into six equal groups consisting of 20 subjects in each. Three experimental groups namely slow continuous, Fartlek, Interval running group and one control group in each category (Tribal and Non-Tribal). The Physiological variables namely Resting Heart rate was measured through Resting heart rate in terms of number of heart beats recorded per minute during resting condition, at the radial artery, Resting systolic blood pressure measured by sphygmomanometer recorded in mm/Hg, Resting diastolic blood pressure measured by sphygmomanometer recorded in mm/Hg and Body fat percentage obtained after taking skin fold measurements at four selected sites namely biceps, triceps, sub-scapula and supra-iliac and total volume of four sites compared to the ready reckoner prepared by Durnin and Rehaman. For the comparison, analysis of covariance was used and the significant level was set at 0.05 level of confidence. The results reveals significant differences of means in both tribal and non-tribal group of experimental category.

INTRODUCTION

Today the preparation of an athlete for achievement is a complex dynamic state, characterized by high level of physical, physiological and psychological efficiency and the degree of perfection of the necessary skill and knowledge, techniques and tactical preparation. Many other factors are also brought into action in this preparation means of rehabilitating strength after loads, special nutrition, organization of general regime in accordance with the conditions of sports activity etc. Thus, athlete's training today is multi-sided process of expedient use of aggregate factors (means, methods and conditions). So, as to influence the development of an athlete and ensure the necessary level of preparation

For the physiological system of the body to be fit, the system must function well enough to support the scientific activity that the individual is performing. Moreover, different activities make different demands upon the organism with respect to circulatory, respiratory, metabolic, neurological and temperature-regulating functions. Physiological fitness is specific to activity. Physiological systems are highly adaptable to exercise. Each task requires effective functioning for the appropriate system.

The primary work of exercise physiologist is to describe the change that occur in organ and organic function as a result of single (acute) or repeated (chronic) dosage of exercise and to explain how those functional changes occur. The first part of this task, i.e. describing changes brought on by exercise, is much nearer completion that the second explaining the mechanism that produce coaching.

OBJECTIVE OF THE STUDY

The objective of the study was to find out the effect of varied aerobic training programme on selected physiological variables between tribal and non tribal adolescent boys from Purulia district in West Bengal were selected at random, as subjects for the study.

METHODOLOGY

In this section the selection of subjects, selection of physiological and performance variables, criterion measures, administration of test, collection of data, administration of training programmes, training schedule, reliability of the data, design of the study and statistical procedure employed for analyzing the data have been described.

SELECTION OF THE SUBJECTS:

Two hundred and forty boys (120 boys from tribal and 120 boys

from non-tribal) from Purulia district in West Bengal were selected at random, as subjects for the study. It was ensured from the health examination that all the subjects were medically fit for going through the experimental treatment of this study.

One hundred twenty subjects each in tribal and non-tribal category were further subdivided randomly into six equal groups consisting of 20 subjects in each. Three experimental designs i.e. slow continuous, Fartlek and interval running group were randomly assigned to the three experimental groups in each category, while remaining one group in each category served as control group. The average age of the subjects was 15 years ranging from 14 to 16 years. The importance of procedure and significance of the study was explained to them in brief and they were asked to act as the subjects from their hearts. Different types of incentives were announced to motivate and encourage them to continue the training programme and to give tests up to the best of their capacity.

SELECTION OF THE VARIABLES: PHYSIOLOGICAL VARIABLES

- i) Resting Heart rate
- ii) Resting systolic blood pressure
- iii) Resting Diastolic blood pressure
- iv) Body fat percentage

CRITERION MEASURES: PHYSIOLOGICAL VARIABLES

1. Resting heart rate in terms of number of heart beats recorded per minute during resting condition, at the radial artery.
2. Resting systolic blood pressure measured by sphygmomanometer recorded in mm/Hg.
3. Resting diastolic blood pressure measured by sphygmomanometer recorded in mm/Hg.
4. Body fat percentage obtained after taking skin fold measurements at four selected sites namely biceps, triceps, sub-scapula and supra-iliac and total volume of four sites compared to the ready reckoner prepared by Durnin and Rehaman.

STATISTICAL PROCEDURE

In order to investigate the comparative effect of each training method on the mean values of physiological variables of the tribal and non-tribal subjects, the analysis of covariance statistics was used. For testing the mean differences among the subjects

belonging to the experimental and control group each in tribal and non-tribal category as well as between the tribal and non-tribal subjects in physiological and performance variables, the level of significance was set at 0.5 level of confidence.

Ancova Table For The Data On Resting Heart Rate For Tribal, Non-tribal, Tribal Control And Non-tribal Control Groups Involved In Continious, Fartlek And Interval Training.

TABLE-1					
SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F	(P-VALUE)SIG.
PRE	4004.743	1	4004.743	636.472	.000
TRAINING	1951.619	11	177.420	28.197	.000
ERROR	1428.307	227	6.292		
CORRECTED TOTAL	7433.496				

Shows the f-value {F(11,227)=28.197} for comparing the adjusted means of the criterion variable in Continuous, Fartlek and Interval training on Tribal, Non-Tribal, Tribal Control and Non-Tribal Control group. F statistics computed for aerobic training was significant because p-value associated with it was .000 which is less than .05 levels, thus the null hypothesis of no difference among the adjusted means for the data on criterion variable in the training groups may be rejected at 5% level.

Since F-statistics was significant, post-hoc comparison has been made for the adjusted means of the training groups, which is shown in table:

Table-2 Resting Heart Rate

GROUP	PRE TEST MEAN	POST TEST MEAN	ADJUSTED MEAN
CONT-T	74.3	67.85	68.143
CONT-NT	75.15	68.9	68.407
CONT-T-CON	75.05	75.2	74.800
CONT-NT-CON	74.35	74.6	74.846
FART-T	73.75	68.95	69.751
FART-NT	75.25	68.75	68.165
FART-T-CON	75	75.2	74.846
FART-NT-CON	74.75	74.95	74.827
INTV-T	74.2	72.3	72.685
INTV-NT	74.4	72.55	72.750
INTV-T-CON	74.35	74.75	74.996
INTV-NT-CON	74.85	75.45	75.234



Figure-1: Pre, Post And Adjusted Means Of The Various Groups.

Ancova Table For The Data On Resting Systolic Blood Pressure For Tribal, Non-tribal, Tribal Control And Non-tribal Control Groups Involved In Continious, Fartlek And Interval Training.

TABLE-3					
SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F	(P-VALUE)SIG.
PRE	4653.042	1	4653.042	522.695	.000
TRAINING	334.571	11	30.416	3.417	.000
ERROR	2020.758	227	8.902		
CORRECTED TOTAL	7076.733	239			

Shows the f-value {F(11,227)=3.417} for comparing the adjusted means of the criterion variable in Continuous, Fartlek and Interval

training on Tribal, Non-Tribal, Tribal Control and Non-Tribal Control group. F statistics computed for aerobic training was significant because p-value associated with it was .000 which is less than .05 levels, thus the null hypothesis of no difference among the adjusted means for the data on criterion variable in the training groups may be rejected at 5% level.

Since F-statistics was significant, post-hoc comparison has been made for the adjusted means of the training groups, which is shown in table:

Table-4 Resting Systolic Blood Pressure

GROUP	PRE TEST MEAN	POST TEST MEAN	ADJUSTED MEAN
CONT-T	117.5	115.65	116.019
CONT-NT	117	115.45	116.197
CONT-T-CON	117.15	117.6	118.233
CONT-NT-CON	119.3	119.5	118.507
FART-T	118	115.35	115.341
FART-NT	118.7	116.8	116.261
FART-T-CON	117	116.6	117.347
FART-NT-CON	117.5	117.7	117.819
INTV-T	118.9	116.55	115.860
INTV-NT	119.2	117.65	116.733
INTV-T-CON	117.6	117.45	117.743
INTV-NT-CON	118	119.35	119.341

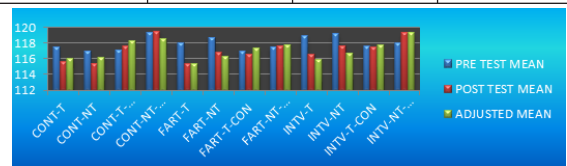


Figure-2: Pre, Post And Adjusted Means Of The Various Groups.

Ancova Table For The Data On Resting Diastolic Blood Pressure For Tribal, Non-tribal, Tribal Control And Non-tribal Control Groups Involved In Continious, Fartlek And Interval Training.

TABLE-5					
SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F	(P-VALUE)SIG.
PRE	1218.761	1	1218.761	100.072	.000
TRAINING	637.336	11	57.940	4.757	.000
ERROR	2764.589	227	12.179		
CORRECTED TOTAL	4747.296	239			

Shows the f-value {F(11,227)=4.757} for comparing the adjusted means of the criterion variable in Continuous, Fartlek and Interval training on Tribal, Non-Tribal, Tribal Control and Non-Tribal Control group. F statistics computed for aerobic training was significant because p-value associated with it was .000 which is less than .05 levels, thus the null hypothesis of no difference among the adjusted means for the data on criterion variable in the training groups may be rejected at 5% level.

Since F-statistics was significant, post-hoc comparison has been made for the adjusted means of the training groups, which is shown in table:

Table-6 Resting Diastolic Blood Pressure

GROUP	PRE TEST MEAN	POST TEST MEAN	ADJUSTED MEAN
CONT-T	76.4	73.7	74.341
CONT-NT	77.9	74.95	74.503
CONT-T-CON	76.4	76.3	76.941
CONT-NT-CON	78.2	78	77.335
FART-T	76.9	72.8	73.078
FART-NT	77.3	75.35	75.338
FART-T-CON	77	77.3	77.505

FART-NT-CON	76.5	78.55	79.118
INTV-T	76.8	75.3	75.605
INTV-NT	78.3	76.95	76.213
INTV-T-CON	76.90	76.7	76.978
INTV-NT-CON	78.8	78.75	77.650

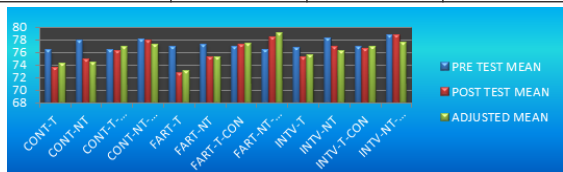


Figure-3: Pre, Post And Adjusted Means Of The Various Groups.

Ancova Table For The Data On Body Fat Percentage For Tribal, Non-tribal, Tribal Control And Non-tribal Control Groups Involved In Continious, Fartlek And Interval Training.

TABLE-7					
SOURCE	SUM OF SQUARES	DF	MEAN SQUARE	F	(P-VALUE)SIG.
PRE	144.136	1	144.136	164.293	.000
TRAINING	59.407	11	5.401	6.156	.000
ERROR	199.149	227	.877		
CORRECTED TOTAL	402.697	239			

Shows the f-value $F(11,227)=6.156$ for comparing the adjusted means of the criterion variable in Continuous, Fartlek and Interval training on Tribal, Non-Tribal, Tribal Control and Non-Tribal Control group. F statistics computed for aerobic training was significant because p-value associated with it was .000 which is less than .05 levels, thus the null hypothesis of no difference among the adjusted means for the data on criterion variable in the training groups may be rejected at 5% level.

Since F-statistics was significant, post-hoc comparison has been made for the adjusted means of the training groups, which is shown in table:

Table-8
Body Fat Percentage

GROUP	PRE TEST MEAN	POST TEST MEAN	ADJUSTED MEAN
CONT-T	13.855	12.955	12.907
CONT-NT	13.655	12.67	12.733
CONT-T-CON	13.41	13.49	13.688
CONT-NT-CON	13.945	14.185	14.088
FART-T	13.705	13.2	13.235
FART-NT	13.905	12.855	12.780
FART-T-CON	13.825	13.92	13.889
FART-NT-CON	14.085	14.11	13.521
INTV-T	13.595	12.7	12.796
INTV-NT	14.045	12.98	12.827
INTV-T-CON	12.94	13.6	13.785
INTV-NT-CON	13.74	13.89	13.906

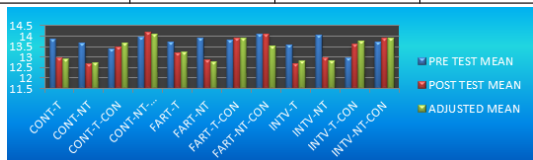


Figure-4: Pre, Post And Adjusted Means Of The Various Groups.

Discussion Of Findings

Table 2 shows the comparison of resting heart rate for tribal, non-tribal, tribal control and non-tribal control groups involved in continuous, fartlek and interval training in pre, post and adjusted post means respectively which reveals significant differences in

adjusted post-test means in both tribal and non-tribal group of experimental category.

Table 4 shows the comparison of resting systolic blood pressure for tribal, non-tribal, tribal control and non-tribal control groups involved in continuous, fartlek and interval training in pre, post and adjusted post means respectively which reveals no significant differences in adjusted post-test means in both tribal and non-tribal group of experimental category.

Table 6 shows the comparison of resting diastolic blood pressure for tribal, non-tribal, tribal control and non-tribal control groups involved in continuous, fartlek and interval training in pre, post and adjusted post means respectively which reveals no significant differences in adjusted post-test means in both tribal and non-tribal group of experimental category.

Table 8 shows the comparison of body fat percentage for tribal, non-tribal, tribal control and non-tribal control groups involved in continuous, fartlek and interval training in pre, post and adjusted post means respectively which reveals significant differences in adjusted post-test means in both tribal and non-tribal group of experimental category.

CONCLUSIONS

Within the limitation of the present study the following conclusions were drawn on the basis of the obtained results:

1. No significant change was noticed due to training effect on systolic as well as diastolic blood pressure of the tribal as well as non tribal boys.
2. Significant change was noticed due to training effect on Resting Heart Rate of the tribal as well as non tribal boys.
3. Specific training effected on reduction of body fat in different percentage in tribal as well as in non tribal boys.

REFERENCES

1. Devries, Herbert A. Physiology of Exercise for Physical Education and Athletics. Doboquelowa: a.Brown Co., 1996.
2. Fox, Edward L.; Bowers, Richard W. and Foss, Merle L. The Physiological Basis of Physical a.Education and Athletics. Iowa: Brown Co., Publishers,1989.
3. Michael Joseph Mc Namara, "The Effects of Three Conditioning Programme on Selected Physical, a.Psychological parameters of College Students", Dissertation Abstracts International, 38(June 1978):7212-A.
4. Morehouse, Laurence E. and Miller Jr. Augustus T. Physiology of Exercise. Saint Louis: The C.V. a.Mosby Co., 1976.Noble, Bruce J. Physiology of Exercise and Sports. Toronto: Mosby College Publishing, 1986.
5. Singh, Haradaya. Sports Training: General Theory and Methods. Patiala: Publication Unit, a.N.S.N.I.S. Publication, 1984.
6. Zegiler, Earle F. Physical Education and Sports Philosophy: Introduction. Englewood Cliffs, N.J.: a.Prentice Hall Inc., 1977.
7. Alteri, Roger Eugen, " The Effects of Interval and Endurance Running upon Anthropometric and a.Physiological Parameters in College Age Females." Dissertation Abstracts International 36:6(December 1975): 3483-A.
8. Davies, Martin Hopkin. "Effects of Three Selected Work Intensity Training Programme on Cardio-a.Respiratory Fitness." Dissertation Abstract International 33:1 (May 1973):6159-6160.
9. Dulin, Leon. " A Comparison of the Effects of Interval and Continuous Training on the Cardio-a.vasculatory Fitness of Deconditioned Mature Males." Dissertation Abstract International 39 (September 1978):1417-A.
10. Durmin, J.V.G.A. and Rahaman, M.M. " The Assessment of the amount of Fat in Human Body from a.Measurements of skinfold Thickness." British Journal of Nutrition 21 (1967):681.
11. Eliakim, A.; Nemet, D. and Shenkman, L. " Serum Enzyme Activities Following Long Distance a.Running: Comparison Between Ethiopian and White Athletes." Israel Journal of Medical Science 31 (November 1995): 111
12. P. Chatterjee., D. Jana. and S.P. Jana, "Study of hand muscle strength, speed and agility power of a.tribal students in West Bengal", Indian Journal of Physiology and Allied Sciences .. 1997 Apr.; 51(2): 57-64
13. J. J. Miller, K. Fletcher and J. Rabat Zinn, "Three Year Follow-up and Clinical Implications of a a.Mindfulness Meditation - Based Stress Reduction Intervention in the Treatment of Anxiety Disorders", Gen. Hosp. Psychiatry, Vol. 17:3 (May 2000), pp.192-200.
14. Gregory, Larry W. "The Development of Aerobic Capacity: A Comparison of Continuous and Interval Training." Research Quarterly 50 (March 1979):199.
15. Hunter, Paul W. "Differences in Speed between American Negro and WhiteChildren in Performance of 35 Yard Dash." Research Quarterly 30 (November 1968):36.