Research Paper

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Effects of High Altitude Training on Selected Physical and Physiological Variable Samong College Level Middle Distance Runners

Physical Education

KEYWORDS : High altitude training, Explosive power, Respiratory rate, Vital capacity

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ABSTRACT

The purpose of the study was to find out the effect of High altitude training on selected physical, physiological variables among college level middle distance runners. To achieve this purpose of the study, thirty athletes were selected from various colleges in Idukki district, Kerala, India. The subject age range between 18 to 23. The selected subject were divided into two groups of fifteen each, Group I underwent high altitude training programme and Group II acted as control group they did not participate in any special training apart from their regular curriculum oriented activities. The selected physical variables such as endurance,explosive power were measured by Cooper 12 minutes run/walk test and standing broad jump. In physiological variables respiratory rate were measured by using expirograph and vital capacity was measured by using wet spirometer. The data were collected at prior and immediately after the training programme for each criterion variables. Analysis of covariance (ANACOVA) was applied to analyse the data. In all the case, 0.05 level of confidence was fixed to test the significance. The result of the study shows selected variable were significantly improved due to the high altitude training programme.

Introduction

Physical exercise is any bodily activity that enhances or maintains physical fitness and overall health and wellness. It is performed for various reasons including strengthening muscles and the cardiovascular system, athletic skill, weight loss or maintenance, as well as for the purpose of enjoyment.

Present high sports performance level are attributed to the superior physical fitness all over the world. Success in sports and games is directly proportional to the amount of quality work one is able to put in and this is obviously restricted by the amount of time available for training. Many training method are in use for developing physical fitness and all of them have been employed successfully on various athletes to attain high sports performance standard.

The theory behind High Altitude Training (HAT) is that if you can adjust your body to perform at competitive levels with less oxygen in your blood and muscles, then when you travel to sea level to compete you should have a higher level of endurance. The "extra" oxygen will prevent the early build-up of lactic acid and keep your heart rate lower even though you are pushing yourself harder than at altitude.

Methodology

The purpose of the study was to find out the effect of high altitude training on selected physical and physiological variables among college level middle distance runners. To achieve this purpose of the study30 college level middle distance runners were selected as subjects. The age of the subjects ranged between 18 to 23 years. The selected Subjects were assigned into two equal group's namelyexperimental group and control group of fifteeneach. The experimental group underwent the high-altitude training programme for five days per week for six weeks. The control group was not underwent any training programme. The following physical variables such as endurance,explosive power were measured by Cooper 12 minutes run/walk test and standing broad jump. In physiological variables respiratory rate were measured by using expirograph and vital capacity was measured by using wet spirometer. The data were collected at prior and immediately after the training programme for each criterion variables. Analysis of covariance (ANACOVA) was applied to analyse the data. In all the case, 0.05 level of confidence was fixed to test the significance.

Analysis of data

The effect of high altitude training on selected physical and physiological variables were analysed and presented below.

TABLE I ANALYSIS OF COVARIENCE OF THE DATA ON ENDURANCE OF PRE AND POST

Variabl-es	Test	Experi-mental group	Control group	Sum of variance	Sum of squares	Df	Mean of squares	'F' ratio
Endurance	Pre	2623.33	2564.00	Between	26403.33	1	26403.33	1.55
				Within	475143.33	28	16969.40	
	Post	2793.00	2584.66	Between	338140.83	1	338140.33	18.01*
				Within	525663.33	28	18773.69	
	Adjus-ted post	2529.97	2657.36	Between	74070.73	1	74070.73	29.14*
				Within	68621.63	27	2541.54	

TESTSSCORES OF EXPERIMENTAL GROUPS AND CONTROL GROUPS

***Significant at .05 level of confidence.**

(The table value required for significant at .05 level of confidence for 1 and 28 and 1 and 27 are 4.20 and 4.23 respectively).

Table I shows that the pretest means of experimental group and control group were 2623.33,2564.00 respectively. The obtained 'F' ratio of 1.55 for pre test means was lesser than the table value of 4.20 for df 1and 28 required for significant at 0.05 level of confidence. The post test means of experimental group and control group were 2793.00,2584.66 respectively. The obtained 'F' ratio of 18.01 for post test means was greater than the table value of 4.20 for df 1and 28 required for significant at 0.05 level of confidence. The adjusted post test means of experimental group and control group were 2529.97,2657.36 respectively. The obtained 'F' ratio of 29.14 for adjust-

ed post test means was greater than the table value of 4.23 for df 1and 27 required for significant at 0.05 level of confidence.

The result of the indicated that there was a significant difference between adjusted post test mean of experimental and control group on endurance.

TABLE II ANALYSIS OF COVARIENCE OF THE DATA ON EXPLOSIVE POWER OF PRE AND POST TESTSSCORES OF EXPERIMENTAL GROUPS AND CONTROL GROUPS

Variabl-es	Test	Experi-mental group	Control group	Sum of variance	Sum of squares	Df	Mean of squares	'F' ratio
Explosive power	Pre	1.92	1.77	Between	0.16	1	0.16	1.83
				Within	2.51	28	0.09	
	Post	2.25	1.82	Between	1.41	1	1.41	16.00*
				Within	2.47	28	0.08	
	Adjust-ed post	1.72	1.98	Between	0.31	1	0.31	24.80*
				Within	0.34	27	0.01	

***Significant at .05 level of confidence.**
(The table value required for significant at .05 level of confidence for 1 and 28 and 1 and 27 are 4.20 and 4.23 respectively).

Table II shows that the pretest means of experimental group and control group were 1.92, 1.77 respectively. The obtained 'F' ratio of 1.83 for pre test means was lesser than the table value of 4.20 for df 1and 28 required for significant at 0.05 level of confidence. The post test means of experimental group and control group were 2.25, 1.82 respectively. The obtained 'F' ratio of 16.00 for post test means was greater than the table value of 4.20 for df 1and 28 required for significant at 0.05 level of confidence. The adjusted post test means of experimental group and control group were 1.72, 1.98 respectively. The obtained 'F' ratio of 24.80 for adjusted post test means was greater than the table value of 4.23 for df 1and 27 required for significant at 0.05 level of confidence.

The result of the indicated that there was a significant difference between adjusted post test mean of experimental and control group on explosive power.

TABLE III ANALYSIS OF COVARIENCE OF THE DATA ON RESPIRATORY RATE OF PRE AND POST TESTSSCORES OF EXPERIMENTAL GROUPS AND CONTROL GROUPS

Variables	Test	Experi-mental group	Control group	Sum of variance	Sum of squares	Df	Mean of squares	'F' ratio
Respiratory rate	Pre	14.20	13.60	Between	2.70	1	2.70	1.98
				Within	38.00	28	1.35	
	Post	13.20	15.60	Between	43.20	1	43.20	14.06*
				Within	86.00	28	3.07	
	Adjust-ed post	14.73	13.07	Between	13.76	1	13.76	17.52*
				Within	21.20	27	0.78	

***Significant at .05 level of confidence.**
(The table value required for significant at .05 level of confidence for 1 and 28 and 1 and 27 are 4.20 and 4.23 respectively).

Table III shows that the pretest means of experimental group and control group were 14.20, 13.60 respectively. The obtained 'F' ratio of 1.98 for pre test means was lesser than the table value of 4.20 for df 1and 28 required for significant at 0.05 level of confidence. The post test means of experimental group and control group were 13.20, 15.60 respectively. The obtained 'F' ratio of 14.06 for post test means was greater than the table value of 4.20 for df 1and 28 required for significant at 0.05 level of confidence. The adjusted post test means of experimental group and control group were 14.73, 13.07 respectively. The obtained 'F' ratio of 17.52 for post test means was greater than the table value of 4.23 for df 1and 27 required for significant at 0.05 level of confidence.

The result of the indicated that there was a significant difference between adjusted post test mean of experimental and control group on respiratory rate.

TABLE IV ANALYSIS OF COVARIENCE OF THE DATA ON VITAL CAPACITY OF PRE AND POST TESTSSCORES OF EXPERIMENTAL GROUPS AND CONTROL GROUPS

Variables	Test	Experi-mental group	Control group	Sum of variance	Sum of squares	Df	Mean of squares	'F' ratio
Vital capacity	Pre	5.03	4.78	Between	0.46	1	0.46	1.77
				Within	7.37	28	0.26	
	Post	5.67	4.85	Between	5.04	1	5.04	15.68*
				Within	9.00	28	0.32	
	Adjust-ed post	4.68	5.12	Between	0.90	1	0.90	21.63*
				Within	1.12	27	0.04	

***Significant at .05 level of confidence.**
(The table value required for significant at .05 level of confidence for 1 and 28 and 1 and 27 are 4.20 and 4.23 respectively).

Table IV shows that the pretest means of experimental group and control group were 5.03, 4.78 respectively. The obtained 'F' ratio of 1.77 for pre test means was lesser than the table value of 4.20 for df 1and 28 required for significant at 0.05 level of confidence. The post test means of experimental group and control group were 5.67, 4.85 respectively. The obtained 'F' ratio of 15.68 for post test means was greater than the table value of 4.20 for df 1and 28 required for significant at 0.05 level of confidence. The adjusted post test means of experimental group and control group were 4.68, 5.12 respectively. The obtained 'F' ratio of 21.63 for post test means was greater than the table value of 4.23 for df 1and 27 required for significant at 0.05 level of confidence.

The result of the indicated that there was a significant difference between adjusted post test mean of experimental and control group on vital capacity.

Conclusions

1. The findings of the study indicates that there was a significant improvement on experimental group on selected dependent variable such asendurance, Explosive power, Respiratory rate and Vital capacity due to high altitude training.
2. The findings of the study indicates that there was a significant difference between the experimental group and control group on selected dependent variable such as endurance, explosive power, respiratory rate and vital capacity.

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