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Effects of Continuous and Interval Running on Selected Strength and Endurance Parameters

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Abstract

The purpose of the study was to find out the effect of sand running on speed and cardio respiratory endurance. To achieve this purpose of the study, thirty men students studying in the Department of Physical Education and Sports Sciences, Annamalai University, Annamalai Nagar, Tamil Nadu, India were selected as subjects at random. The age of the subjects were ranged from 18 to 24 years. The selected subjects were divided into two equal groups of fifteen subjects each, such as sand running group and control group. The group I underwent sand running programme for three days per week for twelve weeks. Group II acted as control group did not participate any special training programmes apart from their regular physical education activities as per their curriculum. The following variables such as speed and cardio respiratory endurance were selected as criterion variables. All the subjects of three groups were tested on selected criterion variables at prior to and immediately after the training programme by using 50 mts run and cooper's 12 minutes run/walk test respectively. The analysis of covariance was used to analyse the significant difference, if any between the groups. The level of significance to test the "F" ratio obtained by the analysis of covariance was tested at .05 level of confidence, which was considered as an appropriate. The results of the study revealed that there was a significant difference between sand running group and control group on selected speed and endurance parameters namely speed and cardio respiratory endurance.

Keywords: Continuous, Interval Running, Strength, Endurance.

Introduction

Physical Education is education through physical activities for the development of total personality of the child and its fulfillment and perfection in body mind and spirit. Butcher considers physical education as "an integral part of total education process which has its aim the development of physically, mentally, emotionally and socially fit citizen through the medium of physical activities which have been selected with a view of realizing these out come.

Methodology

The purpose of the study was designed to examine the effect of continuous and interval running on selected strength and endurance parameters. To achieve this purpose of the study, forty five men students studying bachelor's degree in Department of Physical Education and Sports Sciences, Annamalai University, Annamalai Nagar, Tamilnadu were selected as subjects were randomly selected as subjects. They were divided into three equal groups. Each group consisted of the fifteen subjects. Group I underwent continuous running and Group II underwent interval running for three days per week for twelve weeks. Group III acted as control who did not undergo any special training program apart from their regular physical education program. The following variables namely explosive strength, strength endurance and cardio respiratory endurance were selected as criterion variables. The selected strength and endurance parameters namely explosive strength, strength endurance and cardio respiratory endurance were tested by using standing broad jump, bend knee sit ups and cooper's 12 min run/ walk test separately. All the subjects of three groups were tested on selected dependent variables at prior to and immediately after the training program. The analysis of covariance (ANCOVA) was used to analyze the significant difference, if any among the groups. The .05 level of confidence was fixed as the level of significance to test the 'F' ratio obtained by the analysis of covariance, which was considered as an appropriate.

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Analysis of Data

The influence of continuous and interval running on each criterion variables were analyzed separately and presented below. The analysis of covariance on explosive strength of the pre and post test scores of continuous running group interval running group and control group have been analyzed and presented in Table I

Table I. Analysis of covariance of the data on explosive strength of pre and post tests scores of continuous running, interval running and control groups

Test	Continuous Running Group	Interval Running Group	Control Group	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained 'F' Ratio
Pre Test								
Mean	1.81	1.82	1.82	Between	0.009	2	0.0045	0.82
S.D.	0.02	0.01	0.02	Within	0.23	42	0.0055	
Post Test								
Mean	1.86	1.84	1.82	Between	0.014	2	0.007	14.0*****
S.D.	0.02	0.02	0.02	Within	0.02	42	0.0005	
Adjusted Post Test								
Mean	1.85	1.84	1.81	Between	0.16	2	0.08	16.0*****
				Within	0.21	41	0.005	

* Significant at .05 level of confidence.
(The table values required for significance at .05 level of confidence for 2 and 42 and 2 and 41 are 3.222 and 3.226 respectively).

The table I shows that the adjusted post-test means of continuous running group interval running group and control group are 1.85, 1.84 and 1.81 respectively on explosive strength. The obtained "F" ratio of 16.0 for adjusted post-test means is more than the table value of 3.226 for df 2 and 41 required for significance at .05 level of confidence on explosive strength. The results of the study indicated that there was a significant difference between the adjusted post-test means of continuous running group, interval running group and control group on explosive strength. Since, three groups were compared whenever the obtained "F" ratio for the adjusted post test was found to be significant, the scheffe's test was applied as post hoc test to find out the paired mean differences, if any and it was presented in table II.

Table II. The scheffe's test for the differences between paired means on explosive strength

Continuous Running Group	Interval Running Group	Control Group	Mean differences	Confidence interval value
1.85	1.84	-	0.01	0.008
1.85	-	1.81	0.04	0.008
-	1.84	1.81	0.03	0.008

* Significant at .05 level of confidence.

The table II showed that the mean difference values between continuous running group and interval running group, continuous running group and control group and interval running group and control group on explosive strength were 0.01, 0.04 and 0.03 respectively. The results of the study showed that there was a significant difference between continuous running group and interval running group, continuous running group and control group and interval running group and control group on explosive endurance. The analysis of covariance on strength endurance of the pre and post test scores of continuous running group interval running group and control group have been analyzed and presented in Table III.

Table III. Analysis of covariance of the data on strength endurance of pre and post tests scores of continuous running, interval running and control groups

Test	Continuous Running Group	Interval Running Group	Control Group	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained 'F' Ratio
Pre Test								
Mean	37.43	37.63	37.29	Between	0.006	2	0.003	0.058
S.D.	0.95	0.80	0.998	Within	0.66	42	0.0157	
Post Test								
Mean	43.59	40.79	37.30	Between	0.989	2	0.445	11.125*****
S.D.	0.98	0.77	0.88	Within	1.69	42	0.04	
Adjusted Post Test								
Mean	43.68	40.66	37.31	Between	0.762	2	0.381	9.645*****
				Within	1.62	41	0.0395	

* Significant at .05 level of confidence.
(The table values required for significance at .05 level of confidence for 2 and 42 and 2 and 41 are 3.222 and 3.226 respectively).

The table III shows that the adjusted post-test means of continuous running interval running group and control group are 43.68, 40.66 and 37.31 respectively on strength endurance. The obtained "F" ratio of 9.645 for adjusted post-test means is more than the table value of 3.226 for df 2 and 41 required for significance at .05 level of confidence on strength endurance. The results of the study indicated that there was a significant difference between the adjusted post-test means of continuous running group, interval running group on strength endurance. Since, three groups were compared whenever the obtained "F" ratio for the adjusted post test was found to be significant, the scheffe's test was applied as post hoc test to find out the paired mean differences, if any and it was presented in table IV.

Table IV. The scheffe's test for the differences between paired means on strength endurance

Continuous Running Group	Interval Running Group	Control Group	Mean differences	Confidence interval value
43.68	40.66	-	3.02	1.48
43.68	-	37.31	6.37	1.48
-	40.66	37.31	3.35	1.48

* Significant at .05 level of confidence.

The table IV showed that the mean difference values between continuous running group and interval running group, continuous running group and control group and interval running group and control group on strength endurance were 3.02, 6.37 and 3.35 respectively. The results of the study showed that there was a significant difference between continuous running group and interval running group, continuous running group and control group and interval running group and control group on strength endurance. The analysis of covariance on cardio respiratory endurance of the pre and post test scores of continuous running group, interval running group and control group have been analyzed and presented in Table III.

Table V. Analysis of covariance of the data on cardio respiratory endurance of pre and post tests scores of continuous running, interval running and control groups

Test	Continuous Running Group	Interval Running Group	Control Group	Source of Variance	Sum of Squares	Df	Mean Squares	Obtained 'F' Ratio
Pre Test								
Mean	1536	1539.67	1541	Between	201.07	2	100.54	0.183
S.D.	26.41	20.04	20.99	Within	23093.3	42	549.84	
Post Test								
Mean	1564	1550	1542.3	Between	3621.07	2	1810.54	3.35*****
S.D.	24.71	20.25	22.20	Within	22703.3	42	540.55	
Adjusted Post Test								
Mean	1563.99	1549.3	1540.33	Between	5302	2	2651	42.83*****
				Within	2537.43	41	68.89	

* Significant at .05 level of confidence.
(The table values required for significance at .05 level of confidence for 2 and 42 and 2 and 41 are 3.222 and 3.226 respectively).

The table V shows that the adjusted post-test means of continuous running group, interval running group and control group are 1553.99, 1549.30 and 1540.33 respectively on cardio respiratory endurance. The obtained "F" ratio of 42.83 for adjusted post-test means is more than the table value of 3.226 for df 2 and 41 required for significance at .05 level of confidence on cardio respiratory endurance. The results of the study indicated that there was a significant difference between the adjusted post-test means of continuous running group, interval running group on cardio respiratory endurance. Since, three groups were compared whenever the obtained "F" ratio for the adjusted post test was found to be significant, the scheffe's test was applied as post hoc test to find out the paired mean differences, if any and it was presented in table VI.

Table VI. The scheffe's test for the differences between paired means on cardio respiratory endurance

Continuous Running Group	Interval Running Group	Control Group	Mean differences	Confidence interval value
1563.99	1549.3	-	14.69*	7.82
1563.99	-	1540.33	23.66*	7.82
-	1549.3	1540.33	8.97*	7.82

* Significant at .05 level of confidence.

The table VI showed that the mean difference values between continuous running group and interval running group, continuous running group and control group and interval running group and control group on cardio respiratory endurance were 14.69, 23.66 and 8.97 respectively. The results of the study showed that there was a significant difference between continuous running group and interval running group, continuous running group and control group and interval running group and control group on cardio respiratory endurance.

Conclusions

Based on the findings of the study, the following conclusions were drawn.

1. There was a significant difference between continuous running interval running on explosive strength, strength endurance and cardio respiratory endurance.
2. And also it was found that there was a significant improvement on selected criterion variables such as explosive strength, strength endurance and cardio respiratory endurance due to continuous running and interval running.

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