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A study on effect of 4 week circuit training on motor abilities of Hockey players

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Abstract
The purpose of the study was to see the effect of a 4 week circuit training programme on the motor abilities of Hockey Players. 30 male Hockey Players b/w 14-17 years of age who had participated at least in zonal level tournaments of Distt. Kurukshetra, Haryana were selected as the subjects for the study. AAPHER youth physical fitness test was administered to collect the data. Descriptive statistics and 't' test were employed to analyze the data. Significant differences were found between pre-test and post-test for standing broad jump, 600 meters, Shuttle Run, sit ups and 50 meters Dash of Hockey Players.

Keywords: Motor-abilities, hockey, circuit training

Introduction
Concept of Physical Fitness is as old as mankind, keeping in mind the survival of the fittest, down through the ages, only strong and agile people could defend invaders, protects themselves and their property. It is a hard fact that physically fit people are in a better position to bear the rigorous and abnormal stress and strain, than those. Who are less physically fit? The basic moments like running, jumping, climbing, throwing, lifting etc, require specific physical attributes such as muscular strength, muscular endurance, cardio-respiratory endurance, and strength, balance and co- ordination. Therefore this present study was an effort to investigate the physical fitness status of zonal level Hockey players after 4 week training on motor abilities.

Purpose: The purpose of the study was to compare the effect of 4 week training on motor abilities of Hockey Players.

Selection of subjects: 30 male Hockey Players who had participated in zonal level tournaments of Distt. Kurukshetra, Haryana b/w 14-17 years of age were selected as the subjects for the study.

Selection of variables: The variables selected for training and testing were Strength, Speed, Endurance and Agility.

Administration of tests: To improve the physical fitness or motor abilities of the Hockey Players, 4weeks training was given to the subjects.
The tests were conducted before training and after 4 weeks of training as follows:
Pre-test - Before training.
Post-test – After four weeks of training.
Before every test, proper warming up was given to the subjects. The test items were taken from AAHPER Youth Fitness Test to check the effect of training on motor abilities of Hockey Players

Criterion Measures: AAHPER Youth Physical Fitness Test was administered to collect the data.

Statistical Procedure

For the present study, the data obtained through different tests were statistically analyzed. Mean, standard deviation and't' test were employed to analyze the data.

Table 1: Comparative status of pre-test and post-test for standing broad jump of Hockey Players.

Test	Mean	SD	Mean Difference	S.E.	t-Value
Pre	143.2446667	14.68092798	-10.37066667	4.269650149	-2.428926564
Post	153.6153333	18.22666306			

Significant at .05 level of confidence and for 29 degree of freedom, where the table value of $t_{.05}$ (29) = 2.045.

The table 1 represents the significance of mean difference of pre-test and post-test for standing broad jump of Hockey Players. The mean value of Standing Broad Jump for pre-test and post-test is 143.2447 and 153.615 respectively, where the standard deviation is 14.681 for pre-test and 18.227 for post-test. The mean difference of pre-test and post-test for Standing Broad Jump is calculated as 10.3707. The standard error is also find out as 4.27 and the't' ratio is calculated as 2.429, which is found significant at 0.05 level of confidence with the tabulated value of t .05 = 2.045 at 29 degree of freedom. It exhibits the significant difference in mean values among calculated't' and tabulated 't' of pre-test and post-test of Hockey Players in Standing Broad Jump test.

Table 2: Comparative status of pre-test and post-test for Shuttle Run of Hockey Players

Test	Mean	SD	Mean Difference	S.E.	t-Value
Pre	11.69666667	0.64262572	0.716	0.15819119	4.526168608
Post	10.98066667	0.58217152			

Significant at .05 level of confidence and for 29 degree of freedom, where the table value of t .05 (29) = 2.045.

The table 2 states the significance of mean difference of pre-test and post-test for Shuttle Run of Hockey Players. The mean value of Shuttle Run for pre-test and post-test are 11.69666 and 0.980666 respectively. The standard deviations are 0.642625 and 0.582171 respectively. The mean difference between pre-test and post-test is 0.716 and the standard error is 0.15819. The mean difference of pre-test and post-test is 0.716 and the standard error is 0.15819. The t ratio of pre-test and post-test is 4.526168 which is found to be significant at .05 level of confidence with the tabulated value of $t_{.05}$ (29) = 2.045. It shows the significant difference in the mean values between calculated (t) and tabulated't' for pre-test and post-test of Hockey Players for Shuttle Run list.

Table 3: Comparative status of pre-test and post-test for sit-ups run of Hockey Players

Test	Mean	SD	Mean Difference	S.E.	t-Value
Pre	23	6.700488917	8.566666667	1.62163461	5.282735467
Post	31.56666667	5.840898215			

Significant at 0.05 level of confidence and for 29 degree of freedom, where the table value of $t_{.05}$ (29) = 2.045.

The table 3 states the significance of mean difference of pre-test and post-test for Sit-Ups of Hockey Players. The mean value of sit ups for pre-test and post-test is 23 and 31.567 respectively, where the standard deviation is 6.70 and 5.841 for pre-test and post-test respectively. The mean difference of both tests for Sit-Ups is calculated as 8.567 and the standard error difference between mean is 1.6216. The 't' ratio is calculated as 5.283, which is found significant at 0.05 level of confidence with the tabulated value of $t_{.05}$ (29) = 2.045. It shows the significant difference in mean value between the calculated 't' and tabulated 't' of pre-test and post-test of Kho-Kho players in sit ups test.

Table 4: Comparative status of Pre-test and Post-test for 50 meters Dash of Hockey Players.

Test	Mean	SD	Mean Difference	S.E.	t-Value
Pre	7.697	0.584442853	0.358666667	0.152911481	2.345583632
Post	7.338333333	0.600804537			

Significant at 0.05 level of confidence and for 29 degrees of freedom, when the table values of t $_{0.05}$ (29) = 2.045.

The table 4 shows the significance of mean difference of pre-test and post-test -2 for 50 meters Dash of Hockey Players. The mean value of Pre-test and Post-test for 50 meters Dash are given as 7.697 and 7.338 respectively and the standared deviation for both tests are 0.584 and 0.601. The mean difference between Pre-test and Post-test is calculated as 0.3586. The standard error between means is also calculated as 0.1529. The 't' ratio is calculated as 2.3456 which is significant at 0.05 level of confidence against the tabulated value of $t'_{0.05}$ (29) = 2.045. This seems a significant difference in mean values of Pre-test and Post-test of Hockey Players for 50 meters test.

Table 5: Comparative study of pre-test and post-test for 600 meters Run of Hockey Players.

Test	Mean	SD	Mean Difference	S.E.	t-Value
Pre	116	10.32238946	7.5	2.482404973	3.021263687
Post	108.5	8.865858575			

Significant at 0.05 level of confidence and for 29 degrees of freedom, where the table value of $t_{0.05}$ (29) = 2.045.

The table 5 shows the significance of mean difference of pre-test and post-test for 600 meters Run in care of Hockey Players. The mean value of pre-test and post-test are 116 and108.5 respectively and the standard deviations are found to be 10.32238 and 8.866 respectively. The mean difference between pre-test and post-test is calculated to be 7.5 and the standard error is also between pre-test and post-test is found to be 2.48..The 't' test was calculated as 3.0213 which is significant at .05 level of confidence against the tabulated value of $t_{.05}$ (29)=2.045. This seems a non-significant difference in mean values of pre-test and post-test for 600 meters run test for of Hockey Players.

Conclusions

1. Significance of mean difference of pre-test and post-test for standing broad jump of Hockey Players.
2. Significance of mean difference of pre-test and post-test for Shuttle Run of Hockey Players.
3. Significance of mean difference of pre-test and post-test for Sit-Ups of Hockey Players.
4. Significance of mean difference of pre-test and post-test for 50 meters Dash of Hockey Players
5. Significance of mean difference of pre-test and post-test for 600 meters Run in care of Hockey Players

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