

EFFECT OF SAND TRAINING AND SPRINGBOARD TRAINING ON SELECTED STRIDE FREQUENCY AND MUSCULAR ENDURANCE OF BASKETBALL PLAYERS

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ABSTRACT

The Aim of the study was to find out the the Effect of Sand Training And Springboard Training On Selected Stride Frequency And Muscular Endurance Parameters of Basketball Players Randomly selected Sixty male basketball players (N=60) . Each group consisted of twenty subjects (n=20). Before the training pre-test was taken for all the groups on the selected criterion variables, stride length muscular endurance. The control group did not undergo any type of training. Sand training was given to the experimental group-I and springboard training was given to the experimental group-II on alternate days in the morning for a period of twelve weeks. At the end of experimental period, the post-test was conducted and data collected on criterion variables. The difference between the initial and final means of the groups was considered as the effect of respective treatments. The data obtained were subjected to statistical treatment using ANCOVA. In all cases 0.05 levels was fixed to test the significance.

KEYWORDS: Stride Frequency and Muscular Endurance

INTRODUCTION

In general usage, the term “training” is used to denote different things. In the broad sense, training today is used to mean any organized instruction whose aim is to increase man’s physical psychological, intellectual or mechanical performance rapidly. In the field of sport we speak of training in the sense of preparing sportsman for the highest levels of performance.

The training is a process of preparing an individual for any event or an activity or job. Training for competitive sports is particularly effective way of developing the personality.

According to Dietrich Harre (1982), Sports training is a process of athletic improvement, which is conducted on the basis of scientific principles through which systematic development of mental and physical efficiency, capacity and motivation enables athletes to produce outstanding and record breaking athletic performance. Sports training also consist of all those learning influences and processes that are aimed of enhancing sports performance.

STATEMENT OF THE PROBLEM

The purpose of this study was to find out effect of sand training and springboard training on selected stride frequency and muscular endurance of basketball players

LIMITATIONS

Uncontrollable factors associated with the study were accepted as limitation and the following were considered as limitation of the research study:

1. Certain factors like rational habits like life style, daily routine, diet and climatic conditions were not taken into account in the study.
2. The influence of vigorous academic activity of students could have discouraged or motivated the subjects during training and during testing period.
3. The heterogeneous characters of the subjects in hereditary and environmental factors were recognized as a limitations.
4. The subject's body type and socio economic status of the students were not taken into consideration.
5. Uncontrollable changes in climate and whether conditions such as atmosphere, temperature, humidity and other meteorological factors during the training programme were regarded as limitations.

DELIMITATIONS

To achieve the objectives of the study, the investigator delimited the following factors:

1. This study was conducted only on 60 male Basketball players.
2. The experimental period was only twelve weeks.
3. The subjects were selected from Basketball players in Telangana & Andhra Pradesh
4. Sand training was limited to running, jumping, zig-zag running etcetera on beach sand.
5. The spring board training on a rebounder or a mini trampoline is considered for this study.
6. Springboard training was limited to jumping, diving, trampoline bounce, trampoline prances, trampoline, squats etcetera.

SELECTION OF SUBJECTS

The subjects taken for the present study were sixty male Basketball players from Telangana & Andhra Pradesh who had represented their District Basketball competitions. The subjects were selected on a random basis and were allotted to three groups (control, sand training and springboard training) by random assignment. The age of the subjects ranged from 18 to 24 years.

The requirements of the experimental procedures, testing as well as exercise schedules were explained to them so as to avoid any ambiguity of the effort required on their part and prior to the administration of the study, the investigator got the individual consent from each subject.

SELECTION OF VARIABLES

Dependent Variables

1. Stride Frequency
2. Muscular Endurance

Independent Variables

1. Twelve Weeks Sand training
2. Twelve Weeks Spring board training

EXPERIMENTAL DESIGN

The primary responsibility of the investigator is to adopt the appropriate experimental methodology before proceeding with data collection. A pre-test - post-test randomized group design was used. Each group consisted of twenty subjects (n=20). Before the training pre-test was taken for all the groups on the selected criterion variables stride frequency and muscular endurance. The control group did not undergo any type of training. Sand training was given to the experimental group-I and springboard training was given to the experimental group-II on alternate days in the morning for a period of twelve weeks. at the end of experimental period, the post-test was conducted and data collected on criterion variables. The difference between the initial and final means of the groups was considered as the effect of respective treatments. The data obtained were subjected to statistical treatment using ANCOVA. In all cases 0.05 level was fixed to test the significance.

CRITERION MEASURES

By glancing the literature, and in consultation with professional experts, the following variables were selected as the criterion measures in this study.

1. Stride frequency was calculated as suggested by Seagrave, L. (1996).
2. Muscular endurance was measured through push-ups test.

Table-1
Reliability Co-efficient of Correlation for Test – Retest

| S.No | VARIABLES | Coefficient Correlation |
|------|--------------------|-------------------------|
| 1 | Stride Frequency | 0.81* |
| 2 | Muscular Endurance | 0.88* |

Since the obtained correlation values were more than the tabulated value of r, the reliability of tests was considered reliable at 0.01 level of confidence.

Table-II
SCHEDULE OF SAND TRAINING

| Days | Monday | Wednesday | Friday |
|------|--------|--------------------|--------|
| I-IV | | 2 km Beach running | |

| WEEKS | 1 ½ km Beach running | | 2½ km Beach running |
|----------------------|---|---|--|
| V-VIII WEEKS | Beach running + 1 ½ km plus Hopping and Bounding (repetition) | Beach running + 2 km plus hopping, bounding High knee & speed repetition. | Beach running + 2½ km plus hopping, bounding High knee & speed repetition. |
| IX-XXII WEEKS | Beach running + 2 km plus Hopping and Bounding repetition. | Beach running + 2 ½ km plus Hopping, Bounding High knee & Speed Repetition. | Beach running + 3 km plus Hopping, Bounding High knee & Speed Repetition. |

The above mentioned exercises were performed by the group in the order of small, medium and long step phases which enabled the subjects to gain varied intensities of sand training experiences.

Springboard Training

The springboard is the equipment used on diving in swimming pool, the experts recommends that the dry land springboard training be done through trampoline training. Keeping this in mind the investigator for the purpose of the study, adopted the trampoline training workouts for springboard training for the experimental group-II.

Since the state of training plays a potential role in the contractile power of muscular tissues and thereafter power of muscular tissues and thereafter for the effect, the investigator gave the repetition and intensity of doing the core board exercise more scientifically. To find out the absolute intensity and the relation at the intensity to the maximal capacity, the investigator first asked the subjects of the experimental group to perform the spring board exercise to the level possible under different pause of time in circuit method of interval and practice.

Basic Trampoline Bounce

The basic bounce which seems simple, but it burns a lot of calories. It also tones up quads, glutes, and calf muscles.

1. Stand on the mini trampoline with the feet about 6 inches apart.
2. Bend the arms, keeping the elbows at sides.

3. With a slight bend in knees, lightly bounce up and down. The feet should come about 6 inches off the trampoline.

4. Repeat 30 times.

Trampoline Prances

This will get the heart rate up and give a great workout.

1. Stand on the mini trampoline with the feet 6 inches apart.
2. With hands on hips and knees slightly bent, bounce on the balls of feet, and alternate raising the right and left knees to hip level (mimicking the “knees up” running-in-place exercise from gym class).
3. Repeat 60 times (30 lifts per leg).

Trampoline Squats

It engages core muscles to perform this move on an unstable surface.

1. Stand on the mini trampoline with the feet together and arms at sides.
2. Jump up, spread feet just wider than shoulder width, and land in a squat position with knees bent and thighs parallel to the ground -- as if you were going to sit down in a chair. The arms should be straight out in front.
3. Lightly bounce back to your starting position and repeat 20 times.
Finally, to keep up an equal velocity, the investigator assigned to following dosages.

Table-III

Training Schedule for Spring Board Training on Trampoline

| Weeks | Exercise | No. of Rept. | Rest | Sets |
|-------------------|--------------------|---------------------|-------------|-------------|
| I - III Weeks | Basic Bounce | 30 | 30 seconds | 2 |
| | Prance (Left Leg) | 30 | 30 Seconds | 2 |
| | Prance (Right Leg) | 30 | 30 Seconds | 2 |
| | Squats | 20 | 30 seconds | 2 |
| IV – VI Weeks | Basic Bounce | 30 | 30 seconds | 3 |
| | Prance (Left Leg) | 30 | 30 Seconds | 3 |
| | Prance (Right Leg) | 30 | 30 Seconds | 3 |
| | Squats | 20 | 30 seconds | 3 |
| VII – IX Weeks | Basic Bounce | 30 | 30 seconds | 4 |
| | Prance (Left Leg) | 30 | 30 Seconds | 4 |
| | Prance (Right Leg) | 30 | 30 Seconds | 4 |
| | Squats | 20 | 30 seconds | 4 |
| X to XII Weeks | Basic Bounce | 45 | 30 seconds | 3 |
| | Prance (Left Leg) | 45 | 30 Seconds | 3 |
| | Prance (Right Leg) | 45 | 30 Seconds | 3 |
| | Squats | 30 | 30 seconds | 3 |

RESULTS ON STRIDE FREQUENCY

The statistical analysis comparing the initial and final means of Stride frequency due to Sand training and Spring board training among Basketball players is presented in Table-IV
Table-IV

ANCOVA RESULTS ON EFFECT OF SAND TRAINING AND SPRING BOARD TRAINING COMPARED WITH CONTROLS ON STRIDE FREQUENCY

| | SAND TRAINING | SPRING BOARD TRAINING | CONTROL GROUP | SOURCE OF VARIANCE | SUM OF SQUARES | df | MEAN SQUARES | OBTAINED F |
|-------------------------|---------------|-----------------------|---------------|--------------------|----------------|----|--------------|------------|
| Pre-Test Mean | 3.76 | 3.80 | 3.84 | Between | 0.07 | 2 | 0.03 | 4.65* |
| | | | | Within | 0.42 | 57 | 0.01 | |
| Post-test Mean | 3.81 | 3.84 | 3.84 | Between | 0.01 | 2 | 0.01 | 0.760 |
| | | | | Within | 0.42 | 57 | 0.01 | |
| Adjusted Post-test Mean | 3.85 | 3.84 | 3.80 | Between | 0.03 | 2 | 0.01 | 17.51* |
| | | | | Within | 0.04 | 56 | 0.001 | |
| Mean Diff. | 0.05 | 0.03 | -0.01 | | | | | |

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16.

*Significant at 0.05 level

As shown in Table-IV, the obtained pre-test means on Stride frequency on Sand training group was 3.76, Spring board training group was 3.80 was and control group was 3.84. The obtained pre-test F-value was 4.65 and the required table F-value was 3.16, which proved that there was significant difference among initial scores of the subjects.

The obtained post-test means on Stride frequency on Sand training group was 3.81, Spring board training group was 3.84 was and control group was 3.84. The obtained post-test F-value was 0.760 and the required table F-value was 3.16, which proved that there was significant difference among post-test scores of the subjects.

Taking into consideration of the pre-test means and post-test means adjusted post-test means were determined and analysis of covariance was done and the obtained F-value 17.51 was greater than the required value of 3.16 and, hence it was accepted that there was significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to post-hoc analysis using Scheffe’s Confidence Interval test. The results were presented in Table-V

Table-V

Multiple Comparisons of Paired Adjusted Means and Scheffe’s Confidence Interval Test
Results on Stride frequency

| | |
|--------------|-----------------|
| MEANS | Required |
|--------------|-----------------|

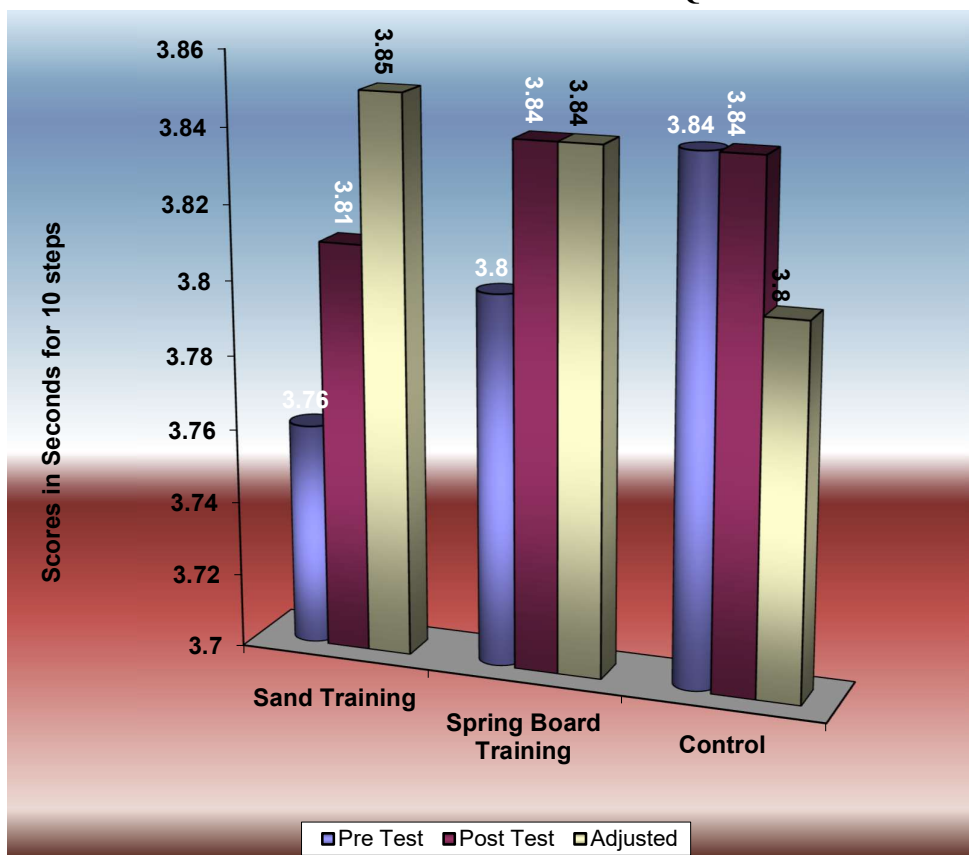
| Sand training Group | Spring board training Group | Control Group | Mean Difference | C.I. |
|---------------------|-----------------------------|---------------|-----------------|------|
| 3.85 | 3.84 | | 0.01 | 0.02 |
| 3.85 | | 3.80 | 0.05* | 0.02 |
| | 3.84 | 3.80 | 0.04* | 0.02 |

* Significant at 0.05 level

The post-hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between Sand training group and control group (MD: 0.05). There was significant difference between Spring board training group and control group (MD: 0.04). There was no significant difference between treatment groups, namely, Sand training group and Spring board training group. (MD: 0.01).

The ordered adjusted means were presented through bar diagram for better understanding of the results of this study in Figure-I

Figure-I
BAR DIAGRAM SHOWING PRE-TEST, POST-TEST AND ORDERED ADJUSTED MEANS ON STRIDE FREQUENCY



Results on Muscular Endurance

The statistical analysis comparing the initial and final means of Muscular endurance due to Sand training and Spring board training among Basketball players is presented in Table-VI

Table-VI

ANCOVA RESULTS ON EFFECT OF SAND TRAINING AND SPRING BOARD TRAINING COMPARED WITH CONTROLS ON MUSCULAR ENDURANCE

| | SAND TRAINING | SPRING BOARD TRAINING | CONTROL GROUP | SOURCE OF VARIANCE | SUM OF SQUARES | df | MEAN SQUARES | OBTAINED F |
|-------------------------|---------------|-----------------------|---------------|--------------------|----------------|----|--------------|------------|
| Pre-test Mean | 30.40 | 30.70 | 31.35 | Between | 9.43 | 2 | 4.72 | 0.22 |
| | | | | Within | 1219.55 | 57 | 21.40 | |
| Post-test Mean | 32.25 | 32.80 | 31.60 | Between | 14.43 | 2 | 7.22 | 0.41 |
| | | | | Within | 1011.75 | 57 | 17.75 | |
| Adjusted Post-test Mean | 32.62 | 32.90 | 31.12 | Between | 36.47 | 2 | 18.24 | 29.45* |
| | | | | Within | 34.68 | 56 | 0.62 | |
| Mean Diff. | 1.85 | 2.10 | 0.25 | | | | | |

Table F-ratio at 0.05 level of confidence for 2 and 57 (df) =3.16, 2 and 56 (df) =3.16.

*Significant at 0.05 level

As shown in Table-VI the obtained pre-test means on Muscular endurance on Sand training group was 30.40, Spring board training group was 30.70 was and control group was 31.35. The obtained pre-test F-value was 0.22 and the required table F-value was 3.16, which proved that there was no significant difference among initial scores of the subjects.

The obtained post-test means on Muscular endurance on Sand training group was 32.25, Spring board training group was 32.80 was and control group was 31.60. The obtained post-test F-value was 0.41 and the required table F-value was 3.16, which proved that there was no significant difference among post-test scores of the subjects.

Taking into consideration of the pre-test means and post-test means adjusted post-test means were determined and analysis of covariance was done and the obtained F-value 29.45 was greater than the required value of 3.16 and, hence it was accepted that there was significant differences among the treated groups.

Since significant differences were recorded, the results were subjected to post-hoc analysis using Scheffe’s Confidence Interval test. The results were presented in Table-VII

Table-VII

Multiple Comparisons of Paired Adjusted Means and Scheffe’s Confidence Interval Test
Results on Muscular endurance

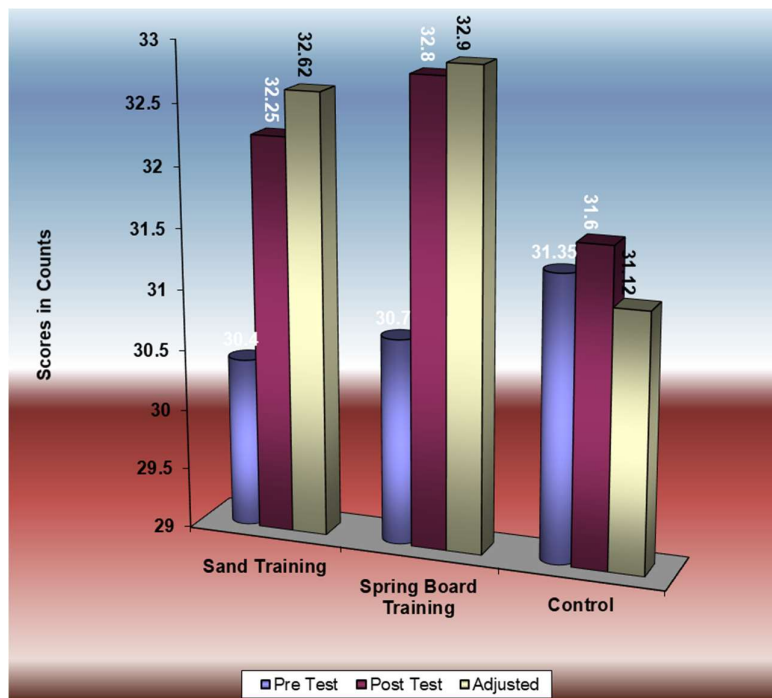
| MEANS | | | | Required C.I. |
|---------------------|-----------------------------|---------------|-----------------|---------------|
| Sand training Group | Spring board training Group | Control Group | Mean Difference | |
| 32.62 | 32.90 | | 0.28 | 0.63 |
| 32.62 | | 31.12 | 1.50* | 0.63 |
| | 32.90 | 31.12 | 1.78* | 0.63 |

* Significant at 0.05 level

The post-hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between Sand training group and control group (MD: 1.50). There was significant difference between Spring board training group and control group (MD: 1.78). There was no significant difference between treatment groups, namely, Sand training group and Spring board training group. (MD: 0.28).

The ordered adjusted means were presented through bar diagram for better understanding of the results of this study in Figure-II

Figure-II
BAR DIAGRAM SHOWING PRE-TEST, POST-TEST AND ORDERED ADJUSTED MEANS ON MUSCULAR ENDURANCE



Discussions on Findings on Muscular Endurance

In order to find out the effect of sand training and spring board training on speed parameter Muscular endurance the obtained pre- and post-test means were subjected to ANCOVA and post-hoc analysis through Scheffe's confidence interval test.

The effect of Sand training and Spring board training on Muscular endurance is presented in Table-VI The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F-value 29.45 was greater than the required table F-value to be significant at 0.05 level.

Since significant F-value was obtained, the results were further subjected to post-hoc analysis and the results presented in Table-VII proved that there was significant difference between Sand training group and control group (MD: 1.50) and Spring board training group and control group (MD: 1.78). Comparing between the treatment groups, it was found that there was no significant difference between Sand training and Spring board training group among Basketball players.

Thus, it was found that Sand training and Sprint board training were significantly better than control group in improving Muscular endurance of the Basketball players.

CONCLUSIONS

Within the limitations and delimitations of the study, the following conclusions were drawn:

1. It was concluded that twelve weeks sand training and spring board training significantly improved stride frequency of the Basketball players compared to control group. Comparison between treatment groups proved that there was no significant difference between sand training group and spring board training group in altering stride frequency of the Basketball players.
2. It was concluded that twelve weeks sand training and spring board training significantly improved muscular endurance of the Basketball players compared to control group. Comparison between treatment groups proved that there was no significant difference between sand training group and spring board training group in altering muscular endurance of the Basketball players.

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