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EFFECT OF SAND TRAINING AND SPRINGBOARD TRAINING ON SELECTED SPEED (STRIDE LENGTH) VARIABLES OF FOOT BALL PLAYERS

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ABSTRACT

The purpose of this study was to find out the Effect of Sand training and springboard training on selected speed (stride length) variable. 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 length,. 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.

Key Words: - Sand Training. Spring Board Training Speed (stride length) variable.

INTRODUCTION

The ancient philosopher Aristotle of Greece proclaimed the quality of people, quoted by Bucher as follows: "The body is the temple of the soul and to reach harmony of body, mind and spirit, the body must be physically fit". The efficiency of the human body depends upon many factors. With the enhanced status of sports in society the provision of sports training has become very important although the need for competent training has long been recognized.

Over three thousand years ago, the Greeks saw the need to provide effective and efficient training for the athletes taking part in the Olympics games. But since 1950s many countries have recognized the importance of an effective sports training programme in a wide range of activities not only for the success in major international

competitions but also for the development of healthy participants comprehensive sports training programme is the key factors in producing the skillful high performance.

SAND RUNNING

In physical geography, a dune is a hill of sand built by Aeolian processes. Dunes occur in different forms and sizes, formed by interaction with the wind. Most kinds of dunes are longer on the windward side where the sand is pushed up the dune and have a shorter “slip face” in the lee of the wind. The valley or trough between dunes is called a slack. A “dune field” is an area covered by extensive sand dunes. Large dune fields are known as ergs.

Benefits of Sand Running

Sand, mud, dirt, grass and trails are excellent training surfaces. They force to run slower for the same heart rate, giving the main benefit of altitude training that is, lower risk of injury as high running intensity is the second best predictor of injury. Half the purpose of 80% of running is to develop a big pump and to maximize the bellows. The heart and lungs don't care if one is swimming, biking, or running at 10 minute miles in 6 inches of mud. However, the running and biking muscles do need some training at 1-2 minutes per mile (for running) slower than race pace, at race pace and also at faster than race pace. The trouble with deep sand is that it gets in to the shoes. It can also mess with the running form. But it gives one a tough workout with very low mileage; the back and shoulders get a workout because one has to maintain balance.

SPRING BOARD TRAINING

A springboard or diving board is used for diving and is a board that is itself a spring, i.e. a linear flex-spring, of the cantilever type.

Springboards are commonly fixed by a hinge at one end (so they can be flipped up when not in use), and the other end usually hangs over a swimming pool, with a point midway between the hinge and the end resting on an adjustable fulcrum.

Because of the need to be light and flexible, springboards are usually made of fiberglass. Most springboards are painted, usually blue, and texture is often added to the surface by mixing crushed glass or sand with the paint to provide additional grip.

To improve the jumping ability athletes tend to do springboard exercises. In this study, the investigator was interested to find out the effect of spring board exercises on the performance of long jumpers (Singh, 1984).

Benefits of Springboard Training

The benefits of spring board training (SBT) are detailed below:

- ❖ Springboard training enhances upper and lower extremity power production for the components of the diving approach, hurdle, and take off. The primary purpose is to increase the diver's time of flight.
- ❖ Increases power production in upper extremity, lower extremity and trunk to maximize velocity of twist spins, and velocity (and compactness) of pike and tuck somersault spins.
- ❖ Increases strength of trunk musculature to stabilize the spine, thereby enabling the diver to maintain posture and withstand impact trauma during entry.
- ❖ Maintains a lean, muscular physique for aesthetic performances purposes.
- ❖ Spring board training is excellent for cross-training. Runners, swimmers, cyclists, rowers, soccer (or football), and others find to be helpful with its total workout.

FOOTBALL

Football is not a matter of life and death. It is much more important than that. Almost all the countries play it and of course millions of people watch it. It is apparently one of the ancient sports and it is the direct ancestor of American Football, Canadian Football, Rugby and several other similar sports.

The game of football is one of the most popular games in the world. The game began in England in the 12th century, but Edward-II banned it in 1324. His successor Edward-III in 1349, Richard-II in 1389 and Henry-IV in 1401 as also the Scottish rulers forbade people from playing football. In the beginning there were no definite rules of the game. Each team played with its own rules. An attempt was made by Thring and Dewinton to frame a uniform set of rules and the first set of football rules were framed in 1862 and revised in 1863. The football Association of England was formed and new rules of this game were framed in 1864.

Importance of Speed in Football

In fact speed training for football might be just as important as traditional weight lifting. The highest ranked players are more likely to outperform their peers in tests like the 10 yard and 40 yards sprints than they

are in the squat or bench press. Thus one could conclude that speed **separates the outstanding from the very good.**

SPEED PARAMETERS

According to Loren Seagrave (1998) there are four different ways of improving athletic ability in running events: (1) Apply greater force; (2) Apply force in less time; (3) Apply force in the proper direction; and (4) Apply force through the proper range of motion.

Stride Length

Take a young Costa Rican sprinter and say, "Run with long strides for coaches." She would probably exaggerate her strides to please the command of the coach. She would increase her actual stride length from the toe of the right foot at takeoff to the toe of the left foot at touchdown. This is the simplistic concept many athletes have of stride length. But stride length is better understood in relation to the athlete's Center of Gravity (COG), and the distance the Center of Gravity travels from take off to touch down is used to figure the actual stride length.

The longer, the distance the athlete's body travels while on the ground, the more time is spent, and the slower the maximum velocity. The relationship between ground and air distance for centre of gravity should be long air distances relative to ground distances! Change how the athletes look at stride length, may be by utilizing the concept of effective stride length: the distance the hip travels through the air in a stride. Therefore, during acceleration runs and buildups, force should be applied into the ground with the goal of projecting the hips forward as far as possible.

OBJECTIVES

1. To formulate sand training schedule for the benefit of football players to improve their speed parameters.
2. To formulate spring board exercises on trampoline for the benefit of football players to improve their speed parameters.
3. To find out the effects of sand training and spring board training on selected speed parameters of football players.

4. To compare the effects of sand training and spring board training with control group and to point out the improvements on selected variables.

STATEMENT OF THE PROBLEM

The purpose of this study was to find out the Effect of Sand training and springboard training on selected speed (stride length) variables.

HYPOTHESES

1. Sand training and springboard training would improve speed parameters, such as, stride length of football players compared to control group.
2. There would be no significant differences between sand training and springboard training in altering selected speed parameters of football players.

LIMITATIONS

This study was limited in the following respect and these limitations would be taken in consideration while interpreting the result.

1. The experiment was conducted on football players selected from different colleges in Andhra Pradesh, who represented their colleges in intercollegiate level tournaments.
2. Selection of subjects is between 19 to 24 years of age only.
3. There was no control over the diet, environment, etc., in this study.
4. Regular activities pertaining to their day to day affairs were not controlled.

DELIMITATION

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

1. This study was conducted only on 60 male football players.
2. The experimental period was only twelve weeks.
3. The subjects were selected from football players of different colleges in 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.

DEFINITION OF THE TERMS

Stride Length

Stride length is the distance covered with each stride. The average stride length was calculated by dividing the distance by the number of strides taken to complete the task of covering that distance (Singh, 1991).

METHODOLOGY

This study describes the methodology and procedure adopted. This includes the selection of subjects, selection of variables, experimental design, experimental treatments, selection of test items, procedure for administering the test items, collection of data and statistical technique employed for analyzing the data.

The purpose of the study was to find out the effect of sand training and springboard training on selected speed parameter (stride length) of football players.

SELECTION OF SUBJECTS

The subjects taken for the present study were sixty men football players from different colleges in Andhra Pradesh, who had represented their college in the inter-collegiate football 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 19 to 24 years with mean age of 21 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

The research scholar reviewed the various scientific literature pertaining to the sand training and springboard training on selected speed variables from books, journals, periodicals, magazines and research

papers. Taking into consideration of feasibility criteria, availability of instruments and the relevance of the variables of the present study, the following variables were selected.

Dependent Variables: Speed parameters: - Stride length

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 length**. 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: - Stride length was calculated as suggested by Seagrave, L. (1996).

TEST ADMINISTRATION: - Stride Length

Purpose:-To measure the stride length of the subjects while performing 50 meters run.

Equipment:-Stop watch, Clapper, Saw Dust

Procedure-While the subjects were allowed to run fast in 50 metres run to measure speed, the measurement of the length of stride was taken in the test course, which consists of an acceleration zone of 20 metres and the test zone of 30 metres (between 20th to 50th metre). The athlete uses the acceleration zone to gain maximum speed through the 30 metres test course. A light coating of sawdust was spread over the test zone that highlighted the footprints. Stride length was the distance from the tip of the rear toe to the tip of the front toe was recorded to the nearest centimetre. To avoid the bilateral discrepancies two successive strides are measured to the nearest centimeter.

Scoring:-The average of two successive strides of the subject was recorded in meter as the individual score.

STATISTICAL PROCEDURE:-The following statistical tool, i.e., one way Analysis of Covariance ANCOVA was followed to estimate the effect of sand training and springboard training on selected speed and endurance parameters of football players. As suggested by Thomas and Nelson.(1990)

$$F\text{-ratio} = \frac{(MSy.x)_b}{(MSy.x)_w}$$

Where,

(MSy.x)_b is the final adjusted mean squares between, and

(MSy.x)_w is the final adjusted mean squares within

When significant differences were noted, the Scheffe’s post hoc test was used to find out the paired means significance difference.

RESULTS AND DISCUSSIONS: RESULTS ON STRIDE LENGTH

The statistical analysis comparing the initial and final means of Stride length due to Sand training and Spring board training among football players is presented in **Table-I**

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

	SAND TRAINING	SPRING BOARD TRAINING	CONTROL GROUP	SOURCE OF VARIANCE	SUM OF SQUARES	df	MEAN SQUARES	OBTAINED F
Pre-Test Mean	1.487	1.481	1.488	Between	0.001	2	0.0003	0.18
				Within	0.107	57	0.002	
Post-Test Mean	1.517	1.508	1.494	Between	0.01	2	0.003	1.628
				Within	0.10	57	0.002	
Adjusted Post- Test Mean	1.515	1.512	1.491	Between	0.01	2	0.003	24.48*
				Within	0.01	56	0.0001	
Mean Diff.	0.030	0.027	0.006					

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-I, the obtained pre-test means on Stride length on Sand training group was 1.487, Spring board training group was 1.481 was and control group was 1.488. The obtained pre-test F-value was 0.18

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 Stride length on Sand training group was 1.517, Spring board training group was 1.508 was and control group was 1.494. The obtained post-test F-value was 1.628 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 24.48 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-II**.

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

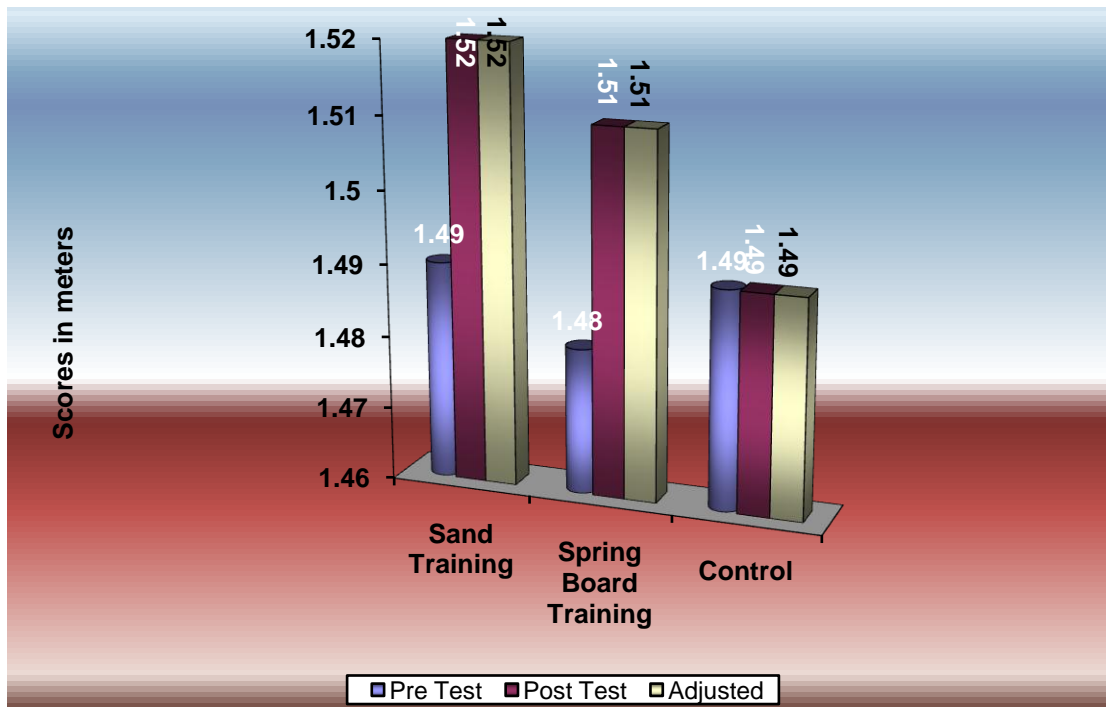
MEANS				Required C.I.
Sand training Group	Spring board training Group	Control Group	Mean Difference	
1.515	1.512		0.004	0.009
1.515		1.491	0.024*	0.009
	1.512	1.491	0.021*	0.009

* 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: 0.024). There was significant difference between Spring board training group and control group (MD: 0.021). There was no significant difference between treatment groups, namely, Sand training group and Spring board training group (MD: 0.004).

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

BAR DIAGRAM SHOWING PRE-TEST, POST-TEST AND ORDERED ADJUSTED MEANS ON STRIDE LENGTH



Discussions on Findings on Stride Length

In order to find out the effect of sand training and spring board training on speed parameter Stride length 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 Stride length is presented in Table-I. The analysis of covariance proved that there was significant difference between the experimental group and control group as the obtained F-value 24.48 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-II proved that there was significant difference between Sand training group and control group (MD: 0.024) and Spring board training group and control group (MD: 0.021). Comparing between the treatment groups, it was found that there was no significant difference between Sand training and Spring board training group among football players. Thus, it was found that Sand training and spring board training were significantly better than control group in improving Stride length of the football players.

DISCUSSIONS ON HYPOTHESES

Sand training and springboard training would improve speed parameters, such as, stride length of football players compared to control group.

There would be no significant differences between sand training and springboard training in altering selected speed parameters of football players.

The results presented in Tables- I show the ANCOVA calculations on speed parameters, stride length respectively, and the obtained F-values 24.48 was greater than the required F-value of 3.10 to be significant at 0.05 level. The post-hoc analysis presented in Tables- II on selected speed parameters respectively proved that sand training and spring board training groups were significantly better than control group and the formulated hypothesis No. 1 that sand training and springboard training would improve speed parameters, such as, stride length of football players compared to control group was accepted at 0.05 level.

The formulated hypothesis No. 2 stated that there would be no significant differences between sand training and springboard training in altering selected speed parameters of football players. The multiple comparisons of paired adjusted means of results were presented in Tables- II, on selected speed parameters, such as, stride length,. The results proved that sand training was significantly better than spring board training on speed to this extent the formulated hypothesis was rejected at 0.05 level, and the alternate hypothesis that there would be significant difference between sand training and spring board training was accepted. As for variables, stride length, there was no significant difference between the treatment groups and hence, the formulated hypothesis was accepted at 0.05 level.

CONCLUSIONS

It was concluded that twelve weeks sand training and spring board training significantly improved speed parameter, such as, stride length of the college level football 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 length of the football players.



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