IMPACT OF CORE STRENGTH AND STAIRCASE TRAINING ON INTERCOLLEGIATE LEVEL ATHLETES' ENDURANCE AND REACTION TIME.

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INTRODUCTION

Sports coaches are proficient in recognising the physical attributes required for success in their domain, they are not equipped to evaluate the psychological aspects that have been shown to exert a substantial influence on sports performance. In the past, coaches have used subjective assessments of traits like an athlete's drive and degree of aggression to predict their chances of success. Everyone has heard tales of athletes who were told they lacked the physical ability to compete, but who overcame these restrictions and went on to become extremely successful people because they had the psychological resources of drive and desire. The success of a programme can thus be greatly impacted by the identification, measurement, and application of these psychological traits in selection processes.

STAIR CASE TRAINING

Weight training and wind sprinting are two types of training that have been used to increase sprinting speed. The goals of these programmes are to increase explosive power, leg strength, leg speed, and speed endurance. **(Mac Miller, 1974)**

Staircase training are good for burning fat and strengthening the heart and lungs.

Staircase training involves innovative, demanding, and physically taxing movement patterns; climbing and descending stairs can test one's arms, legs, and footsteps alike.

Proper stairway or stepping technique also enhances performance and reduces injuries.

CORE STRENGTH TRAINING

Some of the most often used words or phrases in the track or gym in these days are "core" and "core strength." Although most runners would agree that having a strong core would be ideal, we rarely consider what it actually means or why it would be beneficial. **(Dena Evans, 2013)**

Although the term "core strength training" is relatively new in the fitness industry, coaches and athletes have long recognised the benefits of it. There is much more to the core region than merely the muscles of the abdomen. Actually, the goal of core strength training is to work on every muscle group involved in pelvic and spine stability. During many sports activities, the movement of energy from large to tiny body parts depends on these muscle groups.

NEED OF THE STUDY

A healthy body makes it easier to enjoy exercise, maintain abilities, learn new things, and perform better on the sports field. To support a given game, specific physiological systems of the body should be used. Since the demands placed on the body by various games vary in terms of neurological function, the cardio-respiratory systems are extremely adaptive to physical activity**. (Willmore, 1982)**

To enhance athletes' biomotor and performance factors, coaches and athletes support various training and coaching approaches. The purpose of the investigation was to determine how certain biomotor and performance factors, such as those of athletes competing at the intercollegiate level, were affected by stair case and core training.

STATEMENT OF PROBLEM

Thus, the researcher states that the goal of the study is to ascertain how intercollegiate athletes' endurance and response time are affected by stair case training and core strength training.

OBJECTIVES OF STUDY

1. To estimate the effects of stair case training and core strength training on endurance and reaction time among intercollegiate level athletes
2. To compare the effect of staircase training and core strength training on endurance and reaction time among intercollegiate level athletes.

HYPOTHESES

1. It was hypothesized that stair case training and core strength training would significantly influence selected biomotor variables endurance and performance variables reaction time than the control group.
2. It was hypothesized that there would be no significant difference between treatment groups, stair case training and core strength training on selected biomotor and performance variables of intercollegiate level athletes.

SIGNIFICANCE OF STUDY

Although the results of several studies seem to indicate that stair case training and core strength training might improve selected biomotor and performance variables of athletes. And the present study would be significant in the following ways:

1. The study would be significant in linking link between stair case training on athlete's biomotor and performance variables that could pave way for stair case training to be applied in athletic training.
2. The study would be significant in linking link between core strength training on athlete's biomotor and performance variables that could pave way for core strength training to be applied in athletic training.
3. Further with the present study design that determined the variable most influenced by these forms of training among the athlete's biomotor and performance indicators, that require improvement of this specific qualities of athletes may implement as training.
4. Results of the present study would pave way for further research on stair case training and core strength training that evidence database that defines the role of exercise interventions based on stair case training and core training in athletic training.

DELIMITATION

The study was delimited to

1. 75 Intercollegiate level athletes competed in different disciplines of athletic events, represented their Colleges were selected as subjects randomly from different colleges in Andhra Pradesh, India.
2. The selected subjects were in the age group of 18 to 25 years.
3. The students reported a history of a musculoskeletal pathology, or any serious disability or ongoing medical condition were excluded from the study.
4. The selected subjects were grouped into three, namely, stair case training group, core strength training and control groups.
5. The following variables were selected for this study
    a. Dependent Variables

i. Biomotor Variables - Endurance
ii. Performance Variables - Reaction time

b. Independent Variables
i. Stair Case Training for 12 weeks
ii. Core Training for 12 weeks

LIMITATION

This study was limited in the following aspects.

1. The subjects' socioeconomic and cultural backgrounds were not taken into account.
2. Nutrients, genetics, environment, lifestyle choices, and the pupils' extracurricular activities were not taken into account.
3. The subjects' weight and height were not taken into account.
4. Any prior training that the individuals had received before starting the six-month experimental therapy was not taken into account.
5. The weather at the time of the subject's test would have affected the outcome.
6. The individuals' daily activities were uncontrolled.
7. The subject's sleep history before to the test was not taken into account.
8. This study did not take into account the individuals' emotional state, medications taken before the six-month experimental period, or coffee use.

DEFINITION OF TERMS

Biomotor Variables: For the purpose of the study, biomotor variables strength, endurance, coordination and flexibility were selected

Athletic performance physical fitness variables: For the purpose of the study, athletic performance physical fitness variables, speed, agility, explosive power and reaction time were selected.

Stair case Training: exercise apparatus that stimulates the act of climbing stairs is considered as stair case training for the purpose of the study.

Core Training:A training programme that contains the progressive training of the musculature of the lumbo-pelvic-hip complex and or the transverses abdomens, which has a central role in posture and in stabilizing the lumbar spine is considered as core training.

METHODOLOGY

The aim of the research was to investigate the impact of core and stair case training on specific biomotor and performance factors in athletes competing at the intercollegiate level.

SELECTION OF SUBJECTS

The purpose of this study was to examine the effects of core and stair case training on specific biomotor and performance indicators in athletes competing at the intercollegiate level. In order to fulfil the study's objectives, the researcher chose at random a group of engaged young adults, aged 18 to 25, who were enrolled in several Andhra Pradesh colleges and participated in intercollegiate track competitions on behalf of their institutions.

Lastly, 75 male intercollegiate athletes from various sports were chosen at random to participate in this study. Three groups (experimental group I, experimental group II, and control group) were randomly assigned to the subjects. The exercise regimen that the participants in the interventional groups had to adhere to during the trial was explained to them. The training schedule, methodology, and testing protocols were all thoroughly described.

EXPERIMENTAL DESIGN

Random group experimental design was used in this study to achieve this goal. College students who served as subjects were split into three groups—the experimental group I, the experimental group II, and the control group—after being randomly selected based on inclusion and exclusion criteria. For a duration of 12 weeks, the experimental groups I and II received stair case training and core training, respectively. The control group was kept under careful supervision and did not participate in any specific activities. All of the individuals had measurements of certain characteristics, such as biomotor and performance factors, prior to receiving experimental treatment. Pre and post experimental scores were created by adding up the scores from before and after the experimental treatment was completed. The effects of core training and stair case training on particular biomotor and performance characteristics were determined by comparing the starting and final means. In order to compare the starting and final ratings for each case, the gathered data were statistically analysed using ANCOVA with a fixed 0.05 level to test the hypothesis.

CRITERION MEASURES

Based on literature review and consult with professional experts, the researcher selected tests to assess the variables selected for this study, which is presented in

Table I. Showing the Variables, Tests and Units of Measures for the Study

S.No	Variables	Test	Unit of Measurements
1.	**Biomotor Variables**		
	Muscular Endurance	Sit ups for 1 minute	Numbers
2.	**Performance Variables**		
	Reaction time	Simple Reaction time	Seconds

The intraclass correlation coefficient obtained for test-retest data are presented in

Table II.- Intra Class Correlation Coefficient of Test – Retest Scores

S.No	Variable	Test	Obtained 'r'
1.	**Biomotor Variables**		
	Muscular Endurance	Sit ups for 1 minute	0.92*
2.	**Performance Variables**		
	Reaction time	Simple Reaction time	0.89*

* Significant at 0.01 level.

COLLECTION OF DATA

Data on the tests given to the individuals in accordance with the above-described technique were gathered at the time of the initial evaluation and at the conclusion of the 12th week of the intervention. After being tallied, the gathered data were subjected to statistical analysis.

STATISTICAL PROCEDURE

With SPSS, statistical analysis was carried out (Version 16). The distributional normality of all the data was examined both visually and quantitatively. Using an analysis of covariance (ANCOVA) comparison between the pre- and post-intervention data, the statistical significance of the difference within and between groups was estimated, with a five percent significance threshold. Scheffe's post hoc analysis was used to perform a pairwise comparison, and the experimental treatments were determined to have significantly affected the results.

The statistical analysis comparing the initial and final means of Endurance due to Stair case training and Core training exercises among intercollegiate level athletes is presented in

Table III- ANCOVA Results on Effect of Stair Case Training and Core Training Exercises Compared with Controls on Endurance

	STAIR CASE TRAINING	CORE TRAINING EXERCISES	CONTROL GROUP	SOURCE OF VARIANCE	SUM OF SQUARES	df	MEAN SQUARES	OBTAINED F
Pre Test Mean	43.16	43.32	42.32	Between	14.43	2	7.21	0.29
				Within	1784.24	72	24.78	
Post Test Mean	46.32	45.92	42.96	Between	168.43	2	84.21	3.98*
				Within	1524.24	72	21.17	
Adjusted Post Test Mean	46.11	45.57	43.52	Between	92.64	2	46.32	108.73*
				Within	30.25	71	0.43	
Mean Diff	3.16	2.6	0.64					

Table F-ratio at 0.05 level of confidence for 2 and 72 (df) =3.12, 2 and 71 (df) =3.13.

*Significant

The pre-test means for the Endurance on Stair Case Training Group were 43.16, the Core Training Exercises Group was 43.32, and the Control Group was 42.32, as indicated in Table III. The acquired pre-test F value of 0.29 and the needed table F value of 3.12 demonstrated that there was no statistically significant variation in the individuals' initial scores.

The post-test means for the endurance on stair case training group were 46.32, 45.92 for the core training exercises group, and 42.96 for the control group. The fact that the needed table F value was 3.12 and the obtained post test F value was 3.98 demonstrated that the individuals' post test results differed significantly from one another. It was agreed that there were significant differences between the treatment groups when corrected post test means and pre test means were considered. Analysis of covariance was performed, and the resultant F value of 108.73 was higher than the necessary value of 3.13.

Scheffe's Confidence Interval test was used for post hoc examination of the data because significant differences were noted. The outcomes were displayed in

Table IV. Multiple Comparisons of the Endurance Scheffe's Confidence Interval Test Results and Paired Adjusted Means

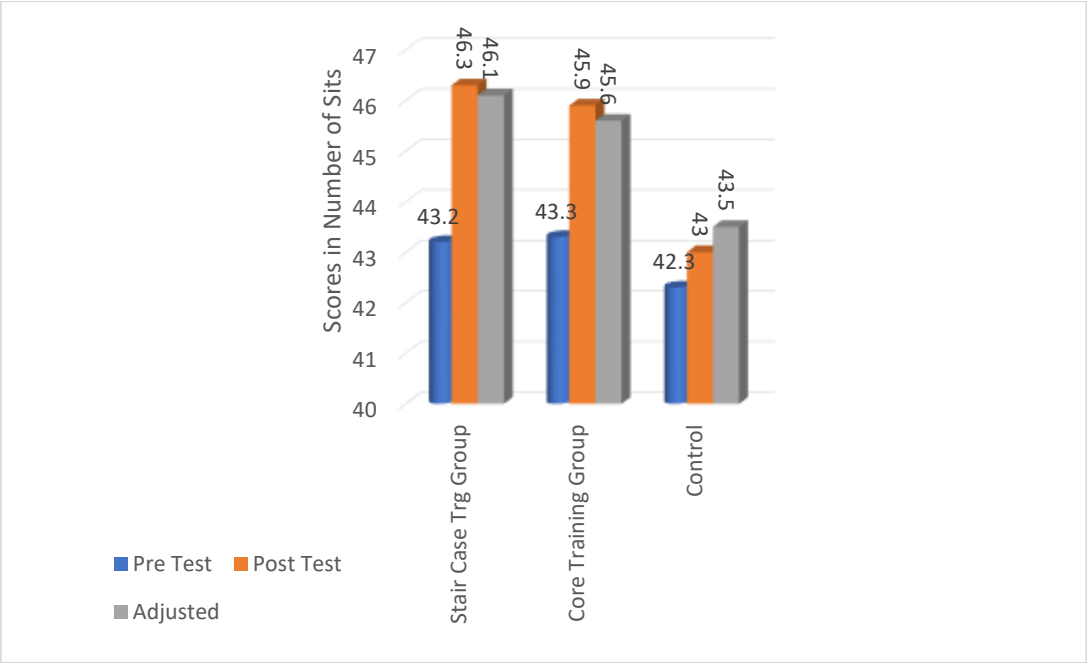
MEANS				Required . C I
Stair case training Group	**Core training exercises Group**	**Control Group**	**Mean Difference**	
46.11	45.57		0.55*	0.46
46.11		43.52	2.59*	0.46
	45.57	43.52	2.04*	0.46

***** Significant

The obtained ordered adjusted means' post hoc analysis demonstrated that the Stair case training group and control group differed significantly from one another (MD: 2.59). The groups that participated in core training exercises and the control group differed significantly (MD: 2.04).

The Stair Case Training Group and the Core Training Exercises Group were the two treatment groups that differed significantly from one another. (MD: 0.55). 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 ENDURANCE



RESULTS ON REACTION TIME

This study presents a statistical analysis that compares the initial and final values of Reaction Time in intercollegiate athletes as a result of stair case training and core training exercises.in

Table V- ANCOVA results on Effect of Stair Case Training and Core Training Exercises Compared with Controls on Reaction Time

	STAIR CASE TRAINING	CORE TRAINING EXERCISES	CONTROL GROUP	SOURCE OF VARIANCE	SUM OF SQUARES	df	MEAN SQUARES	OBTAINED F
Pre Test Mean	0.243	0.270	0.278	Between	0.017	2	0.009	2.982
				Within	0.208	72	0.003	
Post Test Mean	0.217	0.248	0.291	Between	0.068	2	0.034	7.715*
				Within	0.318	72	0.004	
Adjusted Post Test Mean	0.235	0.243	0.278	Between	0.025	2	0.012	5.342*
				Within	0.165	71	0.002	
Mean Diff	-0.025	-0.021	0.013					

Table F-ratio at 0.05 level of confidence for 2 and 72 (df) =3.12, 2 and 71 (df) =3.13.

*Significant

As shown in Table V, the obtained pre test means on Reaction Time on Stair case training group was 0.243, Core training exercises group was 0.270 was and control group was 0.278. The obtained pre test F value was 2.982 and the required table F value was 3.12, which proved that there was no significant difference among initial scores of the subjects.

The obtained post test means on Reaction Time on Stair case training group was 0.217, Core training exercises group was 0.248 was and control group was 0.291. The obtained post test F value was 7.715 and the required table F value was 3.12, which proved that there was significant difference among post test scores of the subjects.

Adjusted post test means were determined by analysis of covariance was done and the obtained F value 5.342 was greater than the required value of 3.13 and hence it was accepted that there was significant differences among the treated groups.

Analysis of post hoc test using Scheffe's Confidence Interval test. The results were presented in

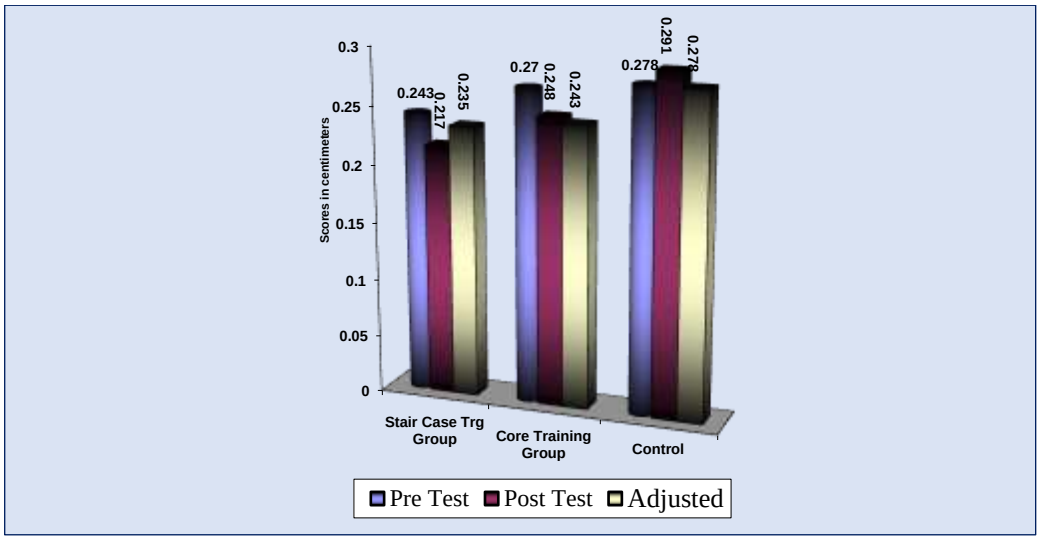
Table VI-Multiple Comparisons of Paired Adjusted Means and Scheffe's Confidence Interval Test Results on Reaction Time

MEANS				Required . C I
Stair case training Group	Core training exercises Group	Control Group	Mean Difference	
0.235	0.243		-0.008	0.034
0.235		0.278	-0.043*	0.034
	0.243	0.278	-0.035*	0.034

***** Significant

The post hoc analysis of obtained ordered adjusted means proved that there was significant differences existed between Stair case training group and control group (MD: -0.043). There was significant difference between Core training exercises group and control group (MD: -0.035). There was no significant difference between treatment groups, namely, Stair case training group and Core training exercises group. (MD: -0.008).

Figure II- Bar Diagram Showing Pre Test, Post Test and Ordered Adjusted Means on Reaction Time



CONCLUSIONS

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

1. It was found that 12 weeks stair case training and core training significantly improved endurance of the intercollegiate athletes compared to control group. It was also found that stair case training was significantly better than core training in improving endurance.
2. It was found that 12 weeks stair case training and core training significantly improved reaction time of the intercollegiate athletes compared to control group. It was also found that there was no significant different between stair case training and core training in altering reaction time of the intercollegiate athletes.

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