



DIFFERENT TRACK SURFACES RUNNING RESISTANCE TRAINING IMPACT ON MAXIMUM SPEED PERFORMANCE OF MEN SPRINTERS

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ABSTRACT

The present study was undertaken to analyze the different track surfaces running resistance training impact on maximum speed performance of men sprinters. Total N=100 (hundred) male engineering students age ranging from 18-20 years selected from Rajiv Gandhi University of Knowledge and Technology, Ongole campus, Andhra Pradesh, India. The chosen sprinters were assigned into five subgroups by the equated group design on the bases of 100 meters run result performance. The subgroups namely empirical group – I considered as sand surface sprint training [SSTG = 20], empirical group –II considered as grass surface for sled sprint training [GSTG =20], empirical group – III considered as mud surface for up & down hill sprint training [MHTG=20], empirical group IV combined sand sled and up & down hill sprint training [SGMG=20] and control [CG=20] group –V were restricted from taking part any specific coaching program (Under observation). The training period was for a twelve weeks. The data were collected before and after the training by conducting 60 meters sprint test. The obtained data's were analyzed by Analysis of Covariance (ANCOVA). The level of significant was fixed at 0.05 levels. The results of the study showed that sand surface sprint training, grass surface sled sprint training, mud surface up & down hill sprint training and combined sand sled and up & down hill sprint training were effective to increase the maximum speed of 60 – meters performance of sprinters comparative to control group.

Keywords: – Sand, mud, sled, sprinters, speed and training

Introduction:

Physical training is meant to make individual physically fit by a regular routine of conditioning exercises. It has been stressed in this text that good all around physical conditioning and participation in many sports and physical activities is essential for young athletes. Not only does this approach bring better results in the long run but certain physical development standards are essential to learn basic techniques of track and field events. Techniques are closely related to strength, power, speed, endurance, agility and mobility. Without the development of these fitness components some skills can't be performed satisfactory.

Sprinting is running full speed over a short distance. The two major factors that determine the sprinting speed of athletes are the stride length and stride frequency. It has often been said that sprinters are born and not made. This is only partly true. Fast running undoubtedly depends largely on inherited physical characteristics and there are some who are extremely gifted with natural speed. However, there is also room for improvement for the less gifted through efficient training to develop running technique and leg power.

Statement of the Problem:

The purpose of the study was to analyze “the different track surfaces running resistance training impact on maximum speed performance of men sprinters.”

Objectives of the Study

1. To investigate the impact of sand surface sprint training, grass surface for sled sprint training, mud surface for up & down hill sprint training and combined training on maximum speed performance of sprinters.
2. To find the significant differences between sand surface sprint training, grass surface for sled sprint training, mud surface for up & down hill sprint training and combined training.

Hypothesis:

- It was hypothesized that sand surface sprint training, grass surface for sled sprint training, mud surface for up & down hill sprint training and combined training would result in a bigger improvement in maximum speed performance of sprinters.
- It is hypothesized that the combined sand surface sprint training, mud surface for up & down hill sprint training and grass surface sled sprint training groups would be superior than other three isolated empirical groups of sprinters in increasing maximum speed performance.

Methodology:

The purpose of this study was to analyze the different track surfaces running resistance training impact on 100- meters race performance of men sprinters. Total N=100 (hundred) male engineering students age ranging from 18-20 years selected from Rajiv Gandhi University of Knowledge and Technology, Ongole campus, Andhra Pradesh, India. The chosen sprinters were assigned into five subgroups by the equated group design on the basis of 100 meters run result performance. The subgroups namely empirical group – I considered as sand surface sprint training [SSTG = 20], empirical group –II considered as grass surface for sled sprint training [GSTG =20], empirical group – III considered as mud surface for up & down hill sprint training [MHTG=20], empirical group IV combined sand sled and up & down hill sprint training [SGMG=20] and control [CG=20] group –V were restricted from taking part in any specific coaching program (Under observation). The training period was for a twelve weeks. The data were collected before and after the training by conducting 60-meters test. The obtained data's were analyzed by Analysis of Covariance (ANCOVA). The level of significance was fixed at 0.05 levels.

Table - I

Analysis of Covariance for 60 - meters performance on Pre Test and Post Test Data of Experimental groups and Control Groups Sprinters (In seconds)

GROUPS	SSTG	GSTG	MSTG	SGMG	CG	SOV	SUM OF	MEAN	OBTAINED 'F'
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	&df	SQUARES	SQUARES	
Pre Test	7.651	7.594	7.618	7.579	7.557	B 4	0.105	0.026	0.233
	±0.400	±0.252	±0.342	±0.323	±0.340	W 95	10.690	0.113	
Post Test	7.951	8.471	7.998	8.609	7.600	B 4	13.521	3.380	33.070*
	±0.407	±0.270	±0.319	±0.316	±0.263	W 95	9.710	0.102	
Adjusted Post	7.908	8.476	7.983	8.627	7.437	B 4	13.622	3.405	172.291*
						W 94	1.858	0.020	

Table F-ratio value at 0.05 level of confidence for 4 and 95 (df) =2.47, 4 and 94 (df) =2.47

*Significant

The above table-I shows that there is a significant difference on 60 - meters performance among the five groups such sand surface sprint training [SSTG], grass surface for sled sprint training [GSTG], mud surface for up & down hill sprint training [MHTG], combined sand sled and up & down hill sprint training [SGMG] and control [CG] group sprinters. Since the calculated 'F' value required being significant at 0.05 level for 4, 95 d/f and 4, 94 are 2.47 and 2.47, but the calculated values of 60 - meters performance post and adjusted posttest 'F' values are 33.070 and 172.291 respectively. Which are higher than the tabulated value. Since the obtained 'F' ratio is found significant.



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Table - II

THE LSD POST HOC TEST FOR PAIRED MEAN OF GROUPS ON MAXIMUM SPEED PERFORMANCE

SSTG	GSTG	MSTG	SGMG	CG	MD	CI
7.908	8.476	-	-	-	0.568*	0.110
7.908	-	7.983	-	-	0.075	
7.908	-	-	8.627	-	0.719*	
7.908	-	-	-	7.437	0.471*	
-	8.476	7.983	-	-	0.493*	
-	8.476	-	8.627	-	0.151*	
-	8.476	-	-	7.437	1.039*	
-	-	7.983	8.627	-	0.644*	
-	-	7.983	-	7.437	0.546*	
-	-	-	8.627	7.437	1.19*	

**Significant at 0.05 level of confidence*

The table II shows outcomes of paired mean differences between sand surface sprint training group [SSTG], grass surface for sled sprint training group [GSTG], mud surface for up & down hill sprint training group [MSTG], combined sand sled and up & down hill sprint training group [SGMG] and control Group [CG] on 60 – meters dash performance in second. There was no significant differences between SSTG and MSTG [MD = 0.075] lower than CI value 0.110. It was evident that both training were equally effective on improvement of maximum speed performance of sprinters.

There was significant differences exist between SSTG and GSTG [MD = 0.568], SSTG and SGMG [MD = 0.719], SSTG and CG [MD = 0.471], GSTG and MSTG [MD = 0.493], GSTG and SGMG [MD = 0.151], GSTG and CG [MD = 1.039], MSTG and SGMG [MD = 0.644], MSTG and CG [MD = 0.546] & SGMG and CG [MD = 1.19], higher than CI value 0.110. It was proved that sand surface sprint training, grass surface for sled sprint training, mud surface for up & down hill sprint training and combined sand sled and up & down hill sprint training were effective to increase the speed of 60 – meters performance of sprinters than control group sprinters.

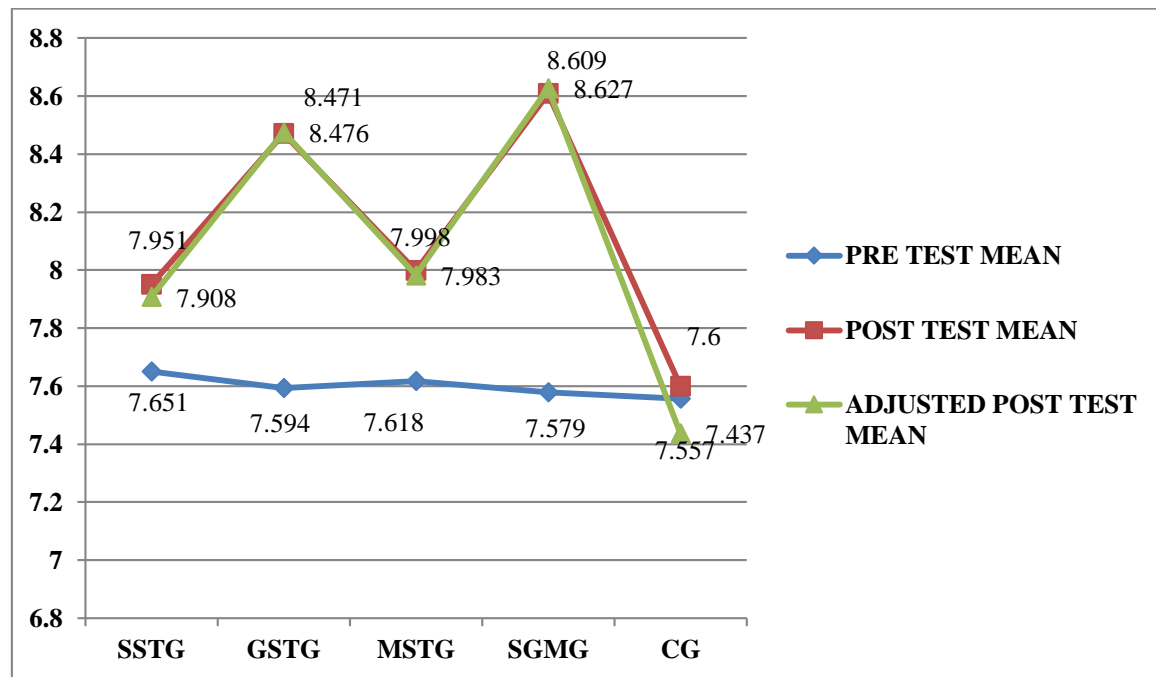


Figure 1: Graphical Illustration Showing the Pre-Test Post-Test and Adjusted Post-Test Mean Values on 60 – Meter sprint performance

Discussion on Hypothesis:

- It was hypothesized that sand surface sprint training, grass surface for sled sprint training, mud surface for up & down hill sprint training and combined training would result in a bigger improvement in maximum speed performance of sprinters. The statistical analysis proved that isolated and combined training significantly enhanced the maximum speed performance of their respective empirical groups. Hence research hypothesis accepted
- It is hypothesized that the combined sand surface sprint training, mud surface for up & down hill sprint training and grass surface sled sprint training groups would be superior than other three isolated empirical groups sprinters in increasing maximum speed performance. Research hypotheses accepted on the bases of result, it is proved that the combined sand surface sprint training, mud surface for up & down hill sprint training and grass surface sled sprint training had positive impact to improve the maximum speed performance.

Discussion and Findings:

On the bases of analysis, found that maximum speed performance of the empirical group's sprinters improved with the impact of isolated and combined training. The studies on 60 – meters performance were Govinda and Vinod (2015) study results clearly evident that uphill & downhill sprinting and sled sprinting are equally effective to improve the maximum speed and acceleration speed of empirical group than control. Sunilkumar et al., (2020) final result stated that assisted sprint training, resisted sprint training and combined sprint training increased the speed level of collegiate sprinters. Aniketpolsai and Somnathrakshit (2016) study confirmed that 50 Yards dash performance of the female sprinter improved with the impact of downhill training. Jason et al., (2014) proved that primary and secondary speed training drills were effective in improving maximum speed (40- yard dash) performance of soccer players. Brain et al., (2018) study proved that heavy resisted sled sprint training and un-resisted sprint training were similarly effective at improving sprint performance in professional soccer players when performed in the competitive phase of the season.

Conclusions:

It was proved that sand surface sprint training, grass surface for sled sprint training, mud surface for up & down hill sprint training and combined sand sled and up & down hill sprint training were effective to increase the maximum speed performance of sprinters than control group sprinters.

Therefore combined sand sled and up & down hill sprint training was better training than isolated sprint training to increase the maximum speed performance of the sprinters. Grass surface for sled sprint training is better training than sand surface sprint training and , mud surface for up & down hill sprint training for improving the maximum speed performance of the sprinters.

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