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# DIFFERENT TRACK SURFACES RUNNING RESISTANCE TRAINING IMPACT ON STRIDE LENGTH 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 stride length 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 ten stride length test (meters). 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 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 stride length performance of sprinters comparative to control group.***

***Keywords: – Sand, mud, sled, sprinters, stride and training***

## Introduction:

In recent year we find a worldwide realization of the importance of physical education. Physical education is a judicious blending of the education of body and mind. Plato said that body and mind should be driven alike like a pair of horses itched to a shaft. Physical education is education through physical activity for the development of physical fitness, social fitness, moral fitness and emotional fitness. A balanced physical education programme not only contributes to the development of the physiques but also develops the mental, moral and social qualities.

Speed has two components stride length and stride frequency. To improve speed, one or both of these components must increase. The forward movement of a sprinter is achieved by the legs driving backwards behind the body. This mean that the drive must be complete with the knee and ankle joints fully extended; the lower leg must not reach forward to land ahead of the body; at the completion of each stride the contact with the ground is made by the ball of the foot and whenever compromise is required between leg speed and leg drive, it must be in favor of the driving action.

**Statement of the Problem:**

The purpose of the study was to analyze "the different track surfaces running resistance training impact on stride length performance of men sprinters."

**Hypothesis:**

1. It was hypothesis 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 stride length performance of sprinters.

2. 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 on stride length.

**Methodology:**

The purpose of this study was to analyze the different track surfaces running resistance training impact on stride length 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 ten stride length tests (meters). The obtained data's were analyzed by Analysis of Covariance (ANCOVA). The level of significant was fixed at 0.05 levels.

**Table - I**
**Analysis of Covariance for Stride Length performance on Pre Test and Post Test Data of Experimental groups and Control Groups Sprinters (In meters)**

| GROUPS | SSTG Mean±SD | GSTG Mean±SD | MSTG Mean±SD | SGMG Mean±SD | CG Mean±SD | SOV &df | SUM OF SQUARES | MEAN SQUARES | OBTAINED 'F' |
|---|---|---|---|---|---|---|---|---|---|
| Pre Test | 1.958 ±0.294 | 1.902 ±0.147 | 1.970 ±0.104 | 1.925 ±0.152 | 1.938 ±0.147 | **B 4** | 0.058 | 0.015 | 0.445* |
| | | | | | | **W 95** | 3.121 | 0.033 | |
| Post Test | 2.158 ±0.278 | 2.009 ±0.235 | 2.021 ±0.235 | 2.146 ±0.143 | 1.930 ±0.143 | **B 4** | 0.755 | 0.189 | 4.826* |
| | | | | | | **W 95** | 3.717 | 0.039 | |
| Adjusted Post | 2.140 | 2.044 | 1.992 | 2.159 | 1.931 | **B 4** | 0.749 | 0.187 | 17.377* |
| | | | | | | **W 94** | 1.012 | 0.011 | |

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 stride length 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 2.4.7 and 2.47, but the calculated values of stride length performance post and adjusted posttest 'F' values are 4.826 and 17.377 respectively. Which are higher than the tabulated value. Since the obtained 'F' ratio is found significant.

**Table - II**

**THE LSD POST HOC TEST FOR PAIRED MEAN OF GROUPS ON STRIDE LENGTH PERFORMANCE**

| SSTG | GSTG | MSTG | SGMG | CG | MD | CI |
|---|---|---|---|---|---|---|
| 2.140 | 2.044 | - | - | - | 0.096* | 0.08 |
| 2.140 | - | 1.992 | - | - | 0.148* | |
| 2.140 | - | - | 2.159 | - | 0.019 | |
| 2.140 | - | - | - | 1.931 | 0.209* | |
| - | 2.044 | 1.992 | - | - | 0.052 | |
| - | 2.044 | - | 2.159 | - | 0.115* | |
| - | 2.044 | - | - | 1.931 | 0.113* | |
| - | - | 1.992 | 2.159 | - | 0.167* | |
| - | - | 1.992 | - | 1.931 | 0.061 | |
| - | - | - | 2.159 | 1.931 | 0.228* | |

***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 stride length in meters. There was no significant differences between SSTG and SGMG [MD = 0.019], GSTG and MSTG [MD = 0.052] & MSTG and CG [MD = 0.061] lower than CI value 0.08. It was evident that both training were equally effective on improvement of stride length performance of sprinters.

There was significant differences exist between SSTG and GSTG [MD = 0.096], SSTG and MSTG [MD = 0.148], SSTG and CG [MD = 0.209], GSTG and SGMG [MD = 0.115], GSTG and CG [MD = 0.113], MSTG and SGMG [MD = 0.167], & SGMG and CG [MD = 0.228], higher than CI value 0.08. It was proved that sand surface sprint training, grass surface for sled sprint training and combined sand sled and up & down hill sprint training were effective to increase the stride length of sprinters than control group sprinters except mud surface for up & down hill sprint training.

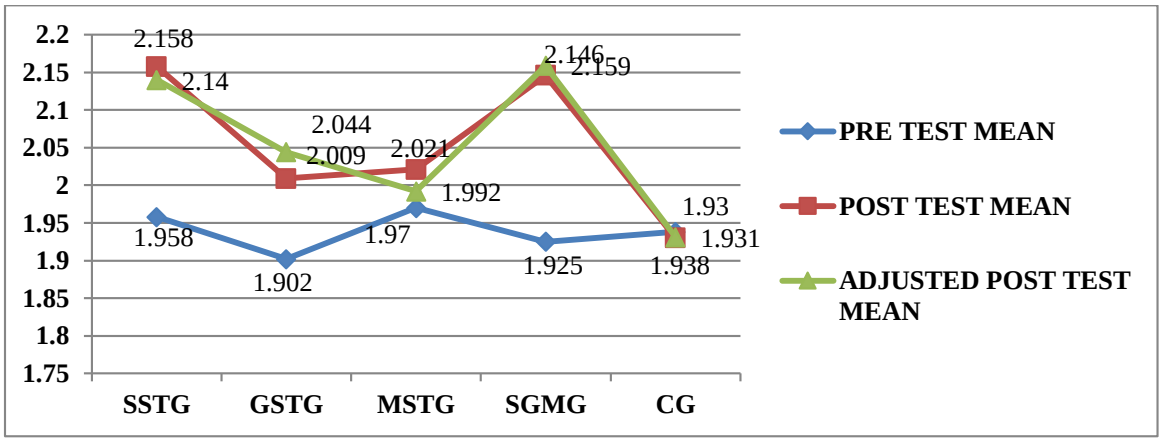


**Figure 1: Graphical Illustration Showing the Pre-Test Post-Test and Adjusted Post-Test Mean Values on stride length performance**

**Discussion on Hypothesis:**

- It was hypothesis 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 stride length performance of sprinters. The statistical analysis proved that isolated and combined training significantly enhanced the stride length 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 on stride length. Research hypotheses rejected 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 is not superior to isolated training for increasing stride length performance.

**Discussion and Findings:**

The experimental treatment report shows that acceleration speed performance time found significantly increase in stride length with the 12-weeks impact of isolated and combined treatment of sand surface sprint training, grass surface sled sprint training and mud surface up & down hill sprint training. The finding of studies related to stride length performance were Alcaraz et al., (2011) concluded that sprinting on a dry sand surface method of training improves the kinematics of sprinting at maximum velocity which may transfer to competition sprinting. Lockie et al., (2003) suggested that lighter loads are best for use in training program for improving kinematics of sprint performance. Beata et al., (2013) concluded that resisted and standard sprint training improves the speed performance in sprint running acceleration in women by improving all different sprint kinematic parameters. Maurice et al., (2015) result declared that 10 m sprint times with the light shoe were significantly reduced compared to the heavy shoe. Zafeiridis et al., (2005) concluded that resist sled training improves acceleration performance, while un-resisted sprint training improves maximum speed.

**Conclusions:**

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

Therefore combined sand sled and up & down hill sprint training was better training than grass surface for sled sprint training and mud surface for up & down hill sprint training. Sand surface sprint training is better than mud surface for up & down hill sprint training for improving stride length of the sprinters.

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