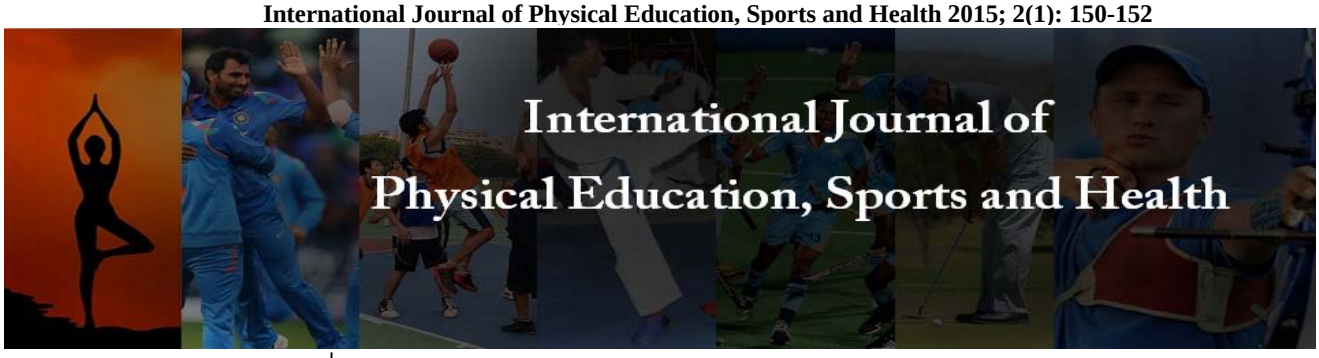
International Journal of Physical Education, Sports and Health 2015; 2(1): 150-152



P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (ISRA): 4.69
IJPESH 2015; 2(1): 150-152

www.kheljournal.com
Received: 13-07-2015
Accepted: 14-08-2015

Govinda Rao Itraju
Ph. D Scholar, Department of Physical Education and Sports, Pondicherry University, Puducherry.

Dr. G. Vinod Kumar
Associate Professor, Department of Physical Education and Sports, Pondicherry University, Puducherry.

Correspondence
Govinda Rao Itraju
Ph. D Scholar, Department of Physical Education and Sports, Pondicherry University, Puducherry.

Effect of Uphill & Downhill Sprinting and Sled Sprinting On Acceleration Speed and Maximum Speed of 13-14 Years Boys

Govinda Rao Itraju, G. Vinod Kumar

Abstract
The purpose of this study was to compare the effect of uphill & downhill sprinting and sled sprinting on acceleration speed and maximum speed of 13-14 years adolescent boys. Total 60 male students were selected randomly as subjects who were used to play regularly in the sports and games from Srikakulam, Andhra Pradesh. The age group of the subjects was between 13-14 years. The subjects were divided into three groups, each group consisting of 20 subjects. Group 1 undergone Uphill & Downhill Sprinting (UDSG), Group 2 was undergone Sled Sprint Training (SSTG) and Group 3 was Control Group (CG) did not participate in any specific training. The experimental groups were undergone training for three alternate days in a week for totally 12 weeks. This study was restricted to selected sprint variables such as Acceleration Speed (AS) and Maximum Speed (MS). Acceleration speed was tested by 30 meters run and maximum speed was tested by 60 meters run. The data were examined by applying analysis of Co-variance and the level of significance was set at 0.05 levels. Based on the analysis of statistical results, it was clearly evident that uphill & downhill sprinting group (UDSG) and sled sprinting training group (SSTG) gave the similar result that is improved acceleration speed (AS) and maximum speed (MS) when compared to control group (CG). There was no significant result were found between experimental groups. There was insignificant result found for CG prior and after experimental duration in both AS and MS.

Keywords: Uphill & Downhill Sprinting, Sled Sprinting, Acceleration Speed, Maximum Speed.

1. Introduction
Sprint running (sprinting) is a high-speed locomotion mode. The winner of the 100-m race at the highest competitive level is considered the fastest man or woman in the world at that time. The 100-m race time is strongly correlated with maximal sprinting speed during the race and the time during which the sprinter can accelerate with maximal effort is limited to 5-7 seconds. Because the maximal sprinting speed depends on the preceding increase in speed in the acceleration phase, the ability to accelerate is critical to 100-m race performance.
When the acceleration phase is of sufficient length and optimum value of running speed, the sprinter is not able to maintain the maximum speed and a long deceleration phase occurs. Top-level sprinters reach their maximum speed between 50 m and 70 m and are able carry on for another 20 m, although very seldom for 30 m. Thus, a third transition sub-phase (35-60 m) takes place only at the elite level. It lasts until the sprinter achieves the level of maximum running speed. In this phase the sprinter reaches peak stride length, stride frequency, and maximum velocity.
There is lot of dispute is there on developing acceleration speed and maximum speed, some athletes are weaker in acceleration zone, some sprinters are failed in maintaining the maximum speed, the author found a solution to solve this type of problems by a package of training to improve both acceleration and maximum speed through the training of uphill & downhill sprinting and sled sprint training.

1.1 Statement of the Problem
The purpose of the study was to find out the effect of uphill & downhill sprint training and Sled sprint training on sprint parameters of adolescent 13-14 years boys.

2. Materials and Methods

2.1 Selection of subjects

The subjects were chosen from 4 Government high schools, Srikakulam, Andhra Pradesh. The subjects were randomly assigned to three groups. Group 1 and Group 2 were experimental groups. Group 3 was control group. Each group consisted of 20 subjects. The age of the subjects was 13-14 years. All the subjects had good physical fitness and had been participated in regular school sports activities. The training program was employed for group 1 (Uphill & Downhill Sprinting) and group 2 (Sled Sprint Training) for 12weeks, 3 sessions in a week consisting 60 minutes per session with alternate three days in a week. Training session had contained warming up, main workout and warming down in the given period.

2.2 Selection of the Variables

Independent variables: Here two different kinds of training methods which were named as Uphill & Downhill Sprinting and Sled Sprint Training selected as independent variables.

Dependent variables: Acceleration speed and Maximum Speed were taken for consideration as dependent variables.

2.3 Test Administration

Sl. No.	Variable	Test	Unit
1.	Acceleration Speed (AS)	30 meter dash	Second (s)
2.	Maximum Speed (MS)	60 meter dash	Meter/second (m/s)

Statistical Techniques

The ANCOVA was used as a statistical tool to find out the effective mean difference among the groups of uphill & downhill sprinting and sled sprint training on Acceleration speed and maximum speed. Whenever, the interaction effect is found significant, the simple effect test was applied. LSD post hoc test was applied to know the difference between the tests. Results were reported as the mean ± SD of all observations, and the level of significance was set at $p < 0.05$.

3. Results and Discussion

The interpretation of results are presented in the following tables.

Table1: Mean, SD and Analysis of Covariance of Uphill & Downhill Sprinting Group (UDSG), Sled Sprint Training Group (SSTG) and Control Group (CG) On Acceleration Speed (In Seconds)

Test	UDSG Mean+SD	SSTG Mean+SD	CG Mean+SD	SOV & df	Sum of Squares	Mean Squares	F-ratio
Pretest	4.25±0.13	4.23±0.14	4.25±0.13	B 2 W 56	2.219 0.218	1.110 0.004	**285.159***
Posttest	3.82±0.06	3.81±0.06	4.23±0.15				
Adjusted posttest	3.817±0.61	3.821±0.67	4.227±0.152				

*significance at 0.05 levels, Table value is 3.17

It is evident from above table that pretests means of UDSG, SSTG and CG acceleration speed were 4.25, 4.23, 4.25 respectively and standard deviation of 0.13, 0.14 and 0.13, the post-test means of 3.82, 3.81, 4.23 and standard deviation of 0.06, 0.06 and 0.15 respectively, the Adjusted posttest means were 3.817, 3.821, 4.227 and standard deviation of 0.61, 0.67, 0.15 found to be significant with an F value of 285.159 at the table value 3.17. Therefore LSD posttest was applied and presented in the table 1 (a).

Table 1 (a): LSD Post Test for Difference between Paired Means of UDSG, SSTG and CG on Acceleration Speed (AS) (In Seconds)

UDSG	SSTG	CG	Mean difference	Sig
3.817	3.821		-.004	.848
3.817		4.227	-.410	.000
	3.821	4.227	-.406	.000

*Significance at 0.05 levels in LSD.

The results were found from the above table that, there is no significant difference in acceleration speed (AS) between UDSG and SSTG (.848), but compared between UDSG and CG (.000) significant difference were shown, similar significant result were found for between SSTG and CG (.000). That means both experimental groups were significantly improved acceleration speed when compared with the control group.

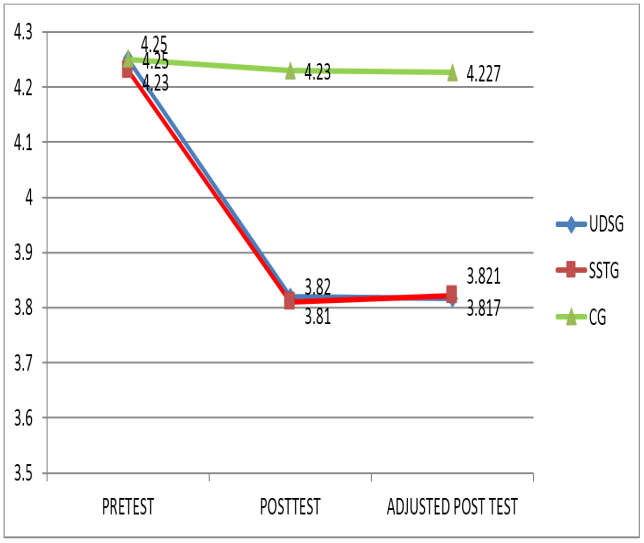


Fig 1: The Details of Pretest, Posttest and Adjusted Post Means of UDSG, SSTG and CG on Acceleration Speed (In Seconds)

Table 2: Mean, SD and Analysis of Covariance of Uphill & Downhill Sprinting Group (UDSG), Sled Sprint Training Group (SSTG) and Control Group (CG) On Acceleration Speed (In M/S)

Test	UDSG Mean+SD	SSTG Mean+SD	CG Mean+SD	SOV & df	Sum of Squares	Mean Squares	F-ratio
Pretest	7.46±0.28	7.51±0.29	7.50±0.32	B 2 W 57	3.865 0.741	1.933 0.013	**146.043***
Posttest	8.07±0.33	8.12±0.34	7.57±0.33				
Adjusted posttest	8.101±0.33	8.106±0.34	7.565±0.33				

*significance at 0.05 levels, Table value is 3.17

It is evident from above table that pretests means of UDSG, SSTG and CG maximum speed were 7.46, 7.51, 7.50 respectively and standard deviation of 0.28, 0.29 and 0.32, the post-test means of 8.07, 8.12, 7.57 and standard deviation of 0.33, 0.34 and 0.33 respectively, the Adjusted posttest means were 8.101, 8.106, 7.565 and standard deviation of 0.33, 0.34, 0.33 found to be significant with an F value of 146.043 at the table value 3.17. Therefore LSD posttest was applied and presented in the table 2 (a).

Table 2(a): LSD Post Test for Difference between Paired Means of UDSG, SSTG and CG on Maximum Speed (AS) (In M/S)

UDSG	SSTG	CG	Mean differences	Sig.
8.101	8.106		-.005	.894
8.101		7.565	.536	.000
	8.106	.565	.541	.000

Significance at 0.05 levels in LSD.

The results were found from the above table that, there is no significant difference in Maximum speed (MS) between UDSG and SSTG (.894), but compared between UDSG and CG (.000) significant difference were shown, similar significant result were found for between SSTG and CG (.000). That means both experimental groups were significantly improved Maximum speed (MS) when compared with the control group.

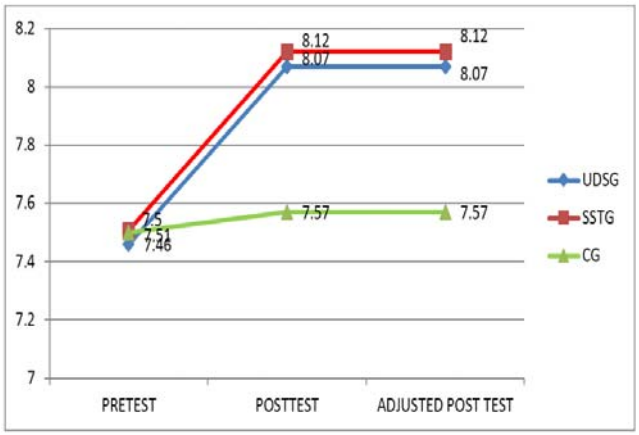


Fig 2: The Details of Pretest, Posttest and Adjusted Post Means of UDSG, SSTG and CG on Maximum Speed (In M/S)

4. Conclusions

1. From the results, it was concluded that Uphill & downhill sprint training (UDSG) and Sled sprint training (SSTG) had shown significant improvement in acceleration speed (AS) in seconds when compared with control group (CG), but there was no significance difference between uphill & downhill sprint training and sled sprint training on acceleration speed.
2. From this study it was also concluded that Uphill & downhill sprint training (UDSG) and Sled sprint training (SSTG) had shown significant improvement in maximum speed (MS) in meter/seconds when compared with control group (CG), but there was no significance difference between uphill & downhill sprint training and sled sprint training on acceleration speed.
3. From the results the researcher may concluded that, the Uphill & downhill sprint training and Sled sprint training had shown same result in both acceleration speed and maximum speed, it mean that AS and MS were improved by doing these training.

5. References

1. Alcaraz PE, Palao JM, Elvira JLL. Determining the optimal load for sprint training with sled towing. J Strength Cond Res. 2009; 23:480-485
2. Bissas AI, Havenetidis K. The use of various strength-power tests as predictors of sprint running performance. J Sport Med Phys Fit. 2008; 48(1):49-54.
3. Donatti A. The development of stride length and frequency in sprinting. New Stud Athl. 1995; 10(1):51-66.
4. Fleck SJ, WJ Kraemer. Designing Resistance Training Programs. Champaign IL: Human Kinetics, 1987, 231-244.
5. Gottschall JS, Kram R. Ground reaction forces during downhill and uphill running. J Biomech. 2005; 38:445-452.
6. Lockie RG, Murphy AJ, Spinks CD, Effects of resisted sled towing on sprint kinematics in field-sport athletes. J Strength Cond Res. 2003; 17(4):760-767.
7. Kawamori N, Newton R, Hori N, Nosaka K. Effects of weighted sled towing with heavy versus light load on sprint acceleration ability, J Strength Cond Res. 2014a; 28:2738-2745.
8. Paradisis G, Cooke CB. The effects of sprint running training on sloping surfaces. J Strength Cond Res. 2006; 20(4):767-777.