E-ISSN: 2707-7020
P-ISSN: 2707-7012
JSSN 2021; 2(2): 31-33
Received: 02-05-2020
Accepted: 25-07-2020

Ravinder Singh
PGT, Physical Education
Govt. Sr. Sec. School,
Shodapur (2045),
Panipat, Haryana,
India

Corresponding Author:
Ravinder Singh
PGT, Physical Education
Govt. Sr. Sec. School,
Shodapur (2045),
Panipat, Haryana,
India

Impact of downhill sprint training on speed of school girls

Ravinder Singh

Abstract
The aim of this study was to examine the downhill sprint training on the speed of school girls. Thirty healthy school boys were selected to experimental (n = 15) and control (n = 15) groups. They carried out 8 weeks downhill training. Speed was measured before and immediately after a training period. The data collected from the two groups prior to and post experimentation were statistically analyzed by analysis of covariance (ANCOVA). The result of the study found that due to the eight weeks of downhill training the speed of the subjects was increased.

Keywords: Downhill training and speed

Introduction
Running is a means of terrestrial locomotion allowing humans to move rapidly on foot. It was defined in athletics terms as a gait in which at regular points during the running cycle both feet are off the ground. It is a distinction to walking, where one foot is forever in contact with the ground, the legs are set aside mostly straight and the center of gravity vaults over the legs in an upturned pendulum fashion. A characteristic feature of a running body from the viewpoint of spring-mass mechanics is that changes in kinetic and potential energy within a stride occur simultaneously, with energy storage talented by elastic tendons and passive muscle elasticity. The term running can refer to any of a mixture of speeds ranging from jogging to sprinting.
Clarkson *et al*. (1992) [3] have shown that the muscle pain and loss of strength can be minimized if runners undertake regular sessions of eccentric training. For runners, this would involve downhill running since downhill's put the muscles in the front of the leg under intense eccentric duress. Downhill sprinting is a method of developing sprinting speed following the acceleration phase. A hill with a maximum of a 15° decline is most suitable. The athletes should run 40 meters to 60 meters to build up to full speed and then maintain the speed for a further 30 meters. A session could comprise of 2 to 3 sets of 3 to 6 repetitions. The difficulty with this method is to find a suitable hill with a safe surface.
Downhill sprinting provides a very good horizontal plyometric stimulus. As long as the slope is no greater than one percent, even inexperienced athletes can run with optimum sprinting mechanics. The elevation of the center of mass is greater at takeoff than it is at touchdown, and this means that the vertical distance through which the center of mass travels also increases. Athletes sprinting downhill experience get greater vertical velocity. Because decline sprinting is an over speed stimulus in both a vertical sense as well as a horizontal sense, it places a great demand on the nervous system. It is a safe and reliable form of assisted training, provided that the grade remains low and that athletes stay within their 10% zone.

Methodology
Participants and Variables
Thirty untrained school girls volunteered to participate in this study. The selected participants were studied higher secondary school at Panipat, Haryana. Their age 17 years to 18 years, height 155 cm to 165 cm, and weight 45 kg to 55 kg. They were randomly divided into two groups and each group consisted of fifteen participants. The speed was selected as dependent variable and it was measured by 50 m run. The data were collected before and after the eight weeks of downhill training.

Training Regimen and Statistical Technique

The experimental group performed the downhill training programs three sessions per week on alternative days for 8 weeks. The downhill training consists of 30 to 40 meters running. Two to three sets per session and three sessions per week with 65-80% HRR. Each set consists of three repetitions. The running intensity was determined by a percentage of heart rate reserve (HRR). The duration of each session was increased once in two weeks as training progressed. The data collected from the two groups prior to and post experimentation were statistically analyzed to find out the significant difference if any, by applying the analysis of covariance (ANCOVA).

Table 1: Analysis of Covariance on Speed of Downhill Training and Control Groups

	Downhill Training Group	Control Group	Source of Variance	Sum of Squares	df	Mean Squares	'F' Ratio
Pre test	7.46	7.49	Between	0.008	1	0.008	0.18
MeanSD	0.21	0.20	Within	1.24	28	0.04	
Post test	6.80	7.34	Between	2.13	1	2.13	37.20*
Mean SD	0.25	0.21	Within	1.60	28	0.05	
Adjusted Post Test	6.79	7.34	Between	2.26	1	2.26	50.18*
Mean			Within	1.22	27	0.04	

(The required table value for significance at 0.05 level of confidence with degrees of freedom 1 and 27 is 4.21 and degree of freedom 1 and 28 is 4.20).
* Significant at .05 level of confidence. It was found from the result of this study that significant differences existing between downhill.

It was found from the result of this study that significant differences existing between downhill Training Group and control group, since the obtained 'F' ratio value of adjusted post test means of 50.18 on speed was greater than the required table value of 4.21 for degrees of freedom 1 and 27 at 0.05 level of confidence. Hence it was concluded that due to the effect of eight weeks of downhill training the speed of the subjects was significantly increased.

Discussions and Conclusion

The result of the study stated that due to the effect of eight weeks of downhill training the speed of the subjects was significantly increased. This result is supported by the following studies. William, *et al*., (2008) study analyzes the effects of hill slope on acute over speed running. The result showed that sprinting on a 5.8 slope increased the subjects' maximal speed. Facciono (1993) suggested that training at a supramaximal running velocity may improve chronic speed. Kunz and Kaufmann (1981) study results indicated that downhill running yielded approximately 5.4% faster sprint times, compared to flat land running.

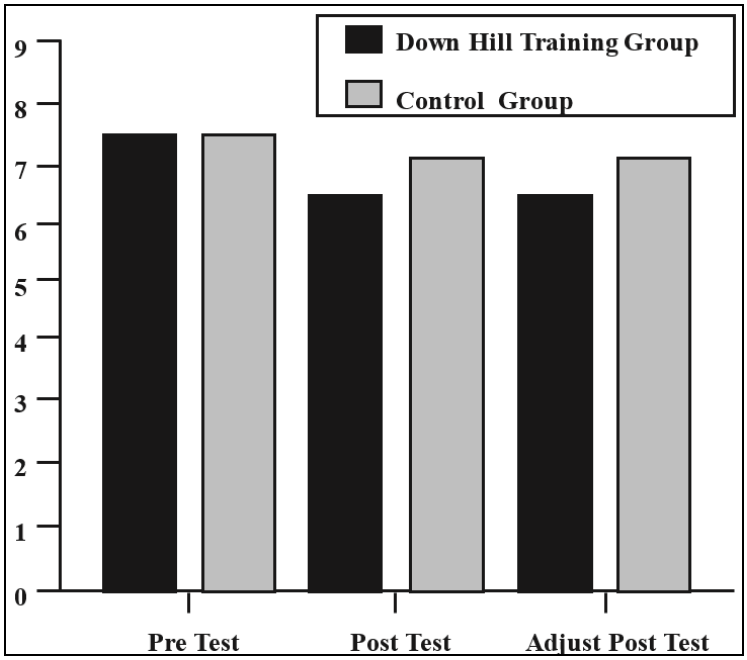

Fig 1: Pyramid Diagram of the Data on Speed of Experimental and Control Groups of School Girls

References

1. Adams TM, Worlay D, Throgmartin D. The Effects of Selected Plyometric and Weight Training on Muscular Leg Power. Track and Field Quarterly Review. 1987;87:45-47.
2. Biewener AA. Animal Locomotion. Oxford University Press, USA, 2003.
3. Clarkson PM, Nosaka K, Braun B. Medicine & Science in Sports & Exercise. 1992;24(5):512520.
4. Ebben WP, Davies JA, Clewien RW. Journal of Strength and Conditioning Research. 2008;22(3):898-902.
5. www.speed-sc.com/why-is-sport-training important 3
6. Dragnea A. (eds.) Theory of Physical Education and Sport, Editura Fest, Bucharest, 2002.
7. Gagea A. Coordinative abilities in sports performance, Editura Afir, Bucharest, 2002.

8. Bondarchuk A. 'Periodization Problems', Legkaya Atletika. 1986;12:1.
9. Dolan P. Happiness by design: finding pleasure and purpose in everyday life. UK; Penguin: Random House. 2015.
10. Bondarchuk A. Transfer of training in sports. Michigan, USA: Ultimate Athlete Concepts, 2007.
11. Darmiento A, Galpin A, Brown L. 'Vertical Jump and Power', Journal of Strength & Conditioning Research, National Strength & conditioning Association. 2012;34(6):34-43.
12. Findley B. 'Is Periodization Applicable to Novice Athletes?', Journal of Strength & Conditioning Research, National Strength & conditioning Association. 2005;27(3):27-28.
13. Haff G. 'Roundtable Discussion: Periodization of Training--- Part 2', Journal of Strength & Conditioning Research, National Strength & conditioning Association. 2004;26(2):56-70.
14. Singh Kulbir. Sports Training, Sports Publication, Ansari Road, Daryaganj, New Delhi.
15. Singh Sukhbir. Sports Training, Angel Publication, Keshav Puram, New Delhi.
16. Yadav Dev Raj. Scientific Principles of Sports Training, Angel Publication, Keshav Puram, New Delhi.
17. Shahare, Avinash, Mandulkar, Uday Dadaji. Scientific Principles of Sports Training, Angel Publication, Keshav Puram, New Delhi.
18. Shekar SC. Sports Training, Khel Sahitya Kendra, Ansari Road, Daryaganj, New Delhi.