



IMPACT OF HILL AND SAND TRAINING ON SPEED AGILITY AND EXPLOSIVE POWER AMONG SOCCER PLAYERS

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Abstract

The purpose of the study was to find out the impact of hill and sand training on speed agility and explosive power among soccer players. The study was conformed to 45 male foot ball players selected from government boys higher secondary school, Sankari, Salem district, Tamilnadu, and their age ranged between 14 to 18 years. They were divided into three equal groups each group consisted of 15 players. Namely experimental group I (Uphill Training group), experimental group II (Sand Training group), and control group. They were tested twice before and after the training with respect to physical variables of speed, agility and explosive power. The training period for this study was three alternative days per week, for six weeks. The collected data were statistically analyzed by analysis of co-variance (ANACOVA) and significance difference on experimental groups with the level of confidence was fixed as 0.05 level. It was concluded that the experimental groups having more significant improvement, than the control group.

Keywords: speed, agility and explosive power, hill training, sand training

Introduction

Physical Education is one of the most ancient arts of the humanities. In its broadest interpretation Physical Education is defined as the art and science of voluntary purposeful and active human movement. It is clear that Physical Education is concerned with a fundamental mode of human expression. Likewise it is an essential form of non – verbal communication which can be communicated very effectively depending and does, express a wider range of emotions while participating in a group towards the activities of Physical Education. (JohnE.Nixon, 1980)

Sports Training

Sports training are the process of preparing an individual for an event or an activity or job. Usually in sports we use the term sports training which denote the sense of preparing sportspersons for highest level of performance. But now a day sports training is not just a term but it is very important subject that affects each and every individual who take up physical activity or sports either for health and fitness or for competition at different level. Hence sports training are the physical, technical, physiological and preparation of an athlete or a player by means of physical exercises. (Ajmer Singh 2008).

Hill Training

Hill training significantly increases the force requirements of our workouts, so it demands an equal increase in our post-workout recovery. Never do more than one or two hill sessions per week, and always conduct the workouts at the recommended volume and intensity. Hill running has a strengthening effect as well as boosting your athlete's power and is ideal for those athletes who depend on high running speeds - soccer, rugby, basketball, cricket players and even runners. To reduce the possibility of injury hill training should be conducted once the athlete has a good solid base of strength and endurance. In hill running, the athlete is using their body weight as a resistance to push against, so the driving muscles from which their leg power is derived have to work harder. The technique to aim for is a "bouncy" style where the athlete has a good knee lift and maximum range of movement in the ankle. They should aim to drive hard, pushing upwards with their toes, flexing their ankle as much as possible, landing on the front part of the foot and then letting the heel come down below the level of the toes as the weight is taken. This stretches the calf muscles upwards and downwards as much as possible and applies resistance which overtime will improve their power and elasticity. The athlete should look straight ahead, as they run (not at their feet) and ensure their neck, shoulders and arms are free of tension. Many experts believe that the "bouncy" action is more important than the speed at which the athlete runs up the hills.

Sand Training

Sand is a great training tool for improving speed and agility. It provides resistance that challenges your muscles, helping to make you faster and more explosive. The constant shifting under your feet engages small stabilizer muscles that improve balance and reduce the risk of injury. Sand training gives you an excuse to work out in the great outdoors. The characteristics of a sand training surface and a grass training surface are quite different. For the athlete there are distinct physiological as well as biomechanical differences when performing on one or the other. The training session used was designed to mimic the movement patterns that are most common to team sports, including acceleration, agility, and common game simulation drills.



The sand training session was conducted on soft, dry beach sand on a level area of beach removed from the water's edge. The grass session was conducted on a well-maintained sporting ground of Kikuyu grass. Athletes were barefoot during the sand trial, compared to the grass trial where they wore shoes. The same training session was completed on both sand and grass surfaces, and 24 hours later, each session was proceeded by a performance trial consisting of vertical jump, repeated sprint ability test, and a 3 kilometer running time trial. These measures were then compared to baseline measures acquired prior to the study. Your anaerobic system is smashed. After training in the sand, with the right program design, regular, one surface, level ground will make you feel like you're accelerating downstream.

Methodology

The purpose of the study was to find out the impact of hill and sand training on speed agility and explosive power among soccer players. To achieve the purpose of the study 45 men foot ball players were selected form Government Boys Higher Secondary School Sankari, Salem, Tamil Nadu as subjects. Their age ranged from 14 to 18 years. They were divided in to three equal groups each group consisted of 15 players. Namely experimental group I, experimental group II and control group. The experimental group I underwent hill training including their regular training for three days per week for six weeks, experimental group II under wand sand training including their regular training for three days per week for six weeks, whereas control group did not expose any special training except their regular training . To achieve the purpose of this study the following speed, agility and explosive power are the criterion variable were selected and measured with 50 meters run, 6 X 10 meters shuttle run and vertical jump respectively.

Training Programme

The subject in the experimental group I underwent hill training and experimental group II underwent sand training. Both the groups were practiced three alternative days per week for a period of six week. Every training session lasted for 45 minutes to 1 hour approximately including warm up and cool down.

Table – I, Hill Training Schedule

S. No	Weeks	Warming – up	Main part					Cool Down
			Reputation	Distance	Set	Rest	Intensity	
1.	1	15 min	4	80 mts	1	7min	85%	15min
2.	2	15 min	4	80 mts	1	7min	90%	15min
3.	3	15 min	5	80 mts	1	6min	85%	10 Min
4.	4	10 min	5	80 mts	1	7min	90%	10 Min
5.	5	15 min	6	80 mts	1	5min	90%	10 Min
6.	6	10 min	6	80 mts	1	6min	95%	10 min

Table – II, Sand Training Schedule

S. No	Weeks	Warming – up	Main part					Cool Down
			Reputation	Distance	Set	Rest	Intensity	
1.	1	15 min	4	80 mts	1	7min	85%	15min
2.	2	15 min	4	80 mts	1	7min	90%	15min
3.	3	15 min	5	80 mts	1	6min	85%	11 Min
4.	4	10 min	5	80 mts	1	7min	90%	11 Min
5.	5	15 min	6	80 mts	1	5min	90%	11 Min
6.	6	10 min	6	80 mts	1	6min	95%	10 min

Analysis of the Data

The subjects of all the groups were tested on speed agility and explosive power at prior and immediately after the training programme. Analysis of co-variance (ANACOVA) was used in this study to find out the effect of hill and sand training on selected physical variables among school level football men players. The significance level was fixed at 0.05 level of confidence which was considered to be the appropriate one for this study. When the F ratio was found to be significant, Scheffe's post hoc test was used to find out the paired mean significant difference.



Table – III, Descriptive analysis of speed, agility and explosive power among experimental groups and control group

S.No	Variables	Group	Pre-Test Mean	SD (±)	Post –Test Mean	SD (±)	Adjusted Mean
1	Speed	UHTG	8.18	0.17	7.45	0.10	7.45
		STG	8.23	0.01	7.72	0.31	7.72
		CG	8.23	0.01	8.09	0.29	8.09
2	Agility	UHTG	24.76	0.48	23.36	0.55	23.34
		STG	24.95	0.02	23.94	0.63	23.95
		CG	24.94	0.02	24.76	0.48	24.77
3	Explosive Power	UHTG	0.54	0.04	0.61	0.03	0.61
		STG	0.52	0.006	0.57	0.02	0.57
		CG	0.52	0.005	0.52	0.02	0.52

UHTG= Uphill Training group STG= Sand Training group CG=Control group

The tables-III the pre, post-test means, standard deviations and adjusted means on selected physical and performance variables of male soccer players were numerical presented. The analysis of covariance on selected variables of experimental groups and control group is presented in table – IV.

TABLE – IV, Computation of Analysis of Covariance On Speed, Agility and Explosive Power among School Foot Ball Players

S.No	Variables	Test	Sum of variance	Sum of squares	Df	Mean square	F ratio
1	Speed	Pre-test	B.G.	0.02	2	0.01	1.35
			W.G.	0.41	42	0.01	
		Post-test	B.G.	3.11	2	1.55	23.66*
			W.G.	2.76	42	0.06	
		Adjusted means	B.S.	3.03	2	1.51	22.61*
			W.S	2.75	41	0.06	
2	Agility	Pre-test	B.G.	0.35	2	0.17	2.28*
			W.G.	3.27	42	0.07	
		Post-test	B.G.	14.79	2	7.39	23.33*
			W.G.	13.31	42	0.31	
		Adjusted means	B.S.	14.43	2	7.218	22.38*
			W.S	13.22	41	0.32	
3	Explosive Power	Pre-test	B.G.	0.004	2	0.002	2.78
			W.G.	0.03	42	0.001	
		Post-test	B.G.	0.05	2	0.028	32.30*
			W.G.	0.03	42	0.001	
		Adjusted means	B.S.	0.05	2	0.02	31.09
			W.S	0.03	41	0.001	

*Significant at 0.05 level of confidences

(The table values required for significance at 0.05 level of confidence for 2 & 42 and 2 & 41 are 3.22 and 3.23 respectively).

In the table the results of analysis of covariance on speed, agility and explosive power. The obtained 'F' ratio of 1.35, 2.28 and 0.71 for Pre-test means was less than the table value of 3.22 for df 2 and 42 required for significance at 0.05 level of confidence on speed, agility and explosive power. The obtained 'F' ratio of 23.66, 23.33 and 32.30 for post-test means was greater than the table value of 3.22 for df 2 and 42 required for significance at 0.05 level of confidence on speed, agility and



explosive power. The obtained 'F' ratio of 22.61, 22.38 and 31.09 for adjusted post-test means was greater than the table value of 3.23 for df 2 and 41 required for significance at 0.05 level of confidence on speed, agility and explosive power. The result of the study indicated that there was a significant difference among the adjusted post test means of uphill training group, sand training group and control group on speed, agility and explosive power.

Since the obtained 'F' ratio value was significant further to find out the pair mean difference, the scheffe's test was employed and presented in table -IV

Table – Iv, The Scheffe's test for the differences between the adjusted Post tests paired means on speed, agility and explosive power among soccer players

uphill training group	sand training group	Control group	Mean difference	Confidence Interval
Speed				
7.45	7.72	.....	0.27*	0.25
7.45	.....	8.09	0.64*	
.....	7.72	8.09	0.37*	
Agility				
23.34	23.95	.....	0.61*	0.54
23.34	.....	24.77	1.43*	
.....	23.95	24.77	0.82*	
Explosive power				
0.61	0.57	.....	0.04*	0.03
0.61	.....	0.52	0.09*	
.....	0.57	0.52	0.05*	

***Significant at 0.05 level of confidences**

From the table-IV, clear that the adjusted post test means are 7.45, 7.72 and 8.09; 23.34, 23.95 and 24.77 & 0.61, 0.57 and 0.52 respectively. The mean differences values are between uphill training group and sand training group; uphill training group and control group & sand training group and control group are 0.27, 0.64 and 0.37; 0.61, 1.43 and 0.82 & 0.04, 0.09 and 0.05 respectively speed, agility and explosive power on are greater than the confidence interval value 0.25, 0.54 and 0.03 at 0.05 level of confidence. The results of the study showed that there were a significant difference between uphill training group and sand training group; uphill training group and control group & sand training group and control group on speed, agility and explosive power. When experimental groups were compared uphill training group showed significant improvement in speed, agility and explosive power.

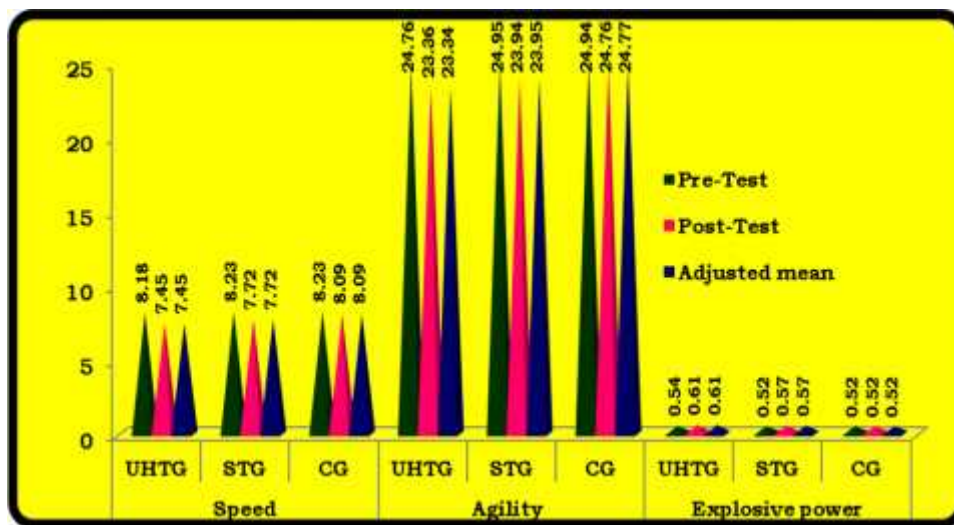


Figure-I The pre, post and adjusted mean values of speed, agility and explosive power experimental groups and control group are graphically represented in the figure-I



Discussion on Finding

The results of the study reveal that there was a significant changes found after the hill training and sand training on speed, agility and explosive power. These results are in corobartation with the studies of **Newton, (2007) and Kotzamanidis, (2006)**.

Conclusions

From the analysis of the data, the following conclusions were drawn.

1. It was concluded that the six weeks of specific hill Training significantly improved speed, agility and explosive power.
2. It was concluded that the six weeks of specific sand training significantly improved speed, agility and explosive power.
3. When compare to sand training group hill training group shows better improvement on speed, agility and explosive power.

Reference

1. Ajmir singh, jagdish, bains. Jagtar singh gill, rachhpal singh brar, nirmaljit kaur rathee., (2008) essential of physical education, kalyani publishers, New Delhi
2. Juriverchoshanskij. (1999) the skills of programming the training process.IAAF New Studies in Athletics. 4(3)54-57.
3. Kanika K. (2005). Soccer coaching manual, New Delhi, sports publication.
4. Kotzamanidis, (2006) “Effect of Hill Training on Running Performance and Vertical Jumping in Prepubertal Boys”, Journal of Strength Conditioning Research. 20(2), 441-5
5. Diallo, (2001) “Effects of Hill Training Followed By a Reduced Training Programme on Physical Performance in Prepubescent Soccer Players”, Journal of Sports Medicine and Physical Fitness. 41(3)
6. Newton, et. al., (2007) “The Effects of Ten Weeks of Resistance and Combined Hill and Sprint Training with the Meridian Elyte Athletic Shoe on Muscular Performance in Women”, Journal of Strength and Conditioning Research. 21(3), 882-7.