



## Persuade of high and Medium Intensity of Weight Training on Chosen Speed Variables between Untrained Boys

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### Abstract

*The purpose of the study was to find out the persuade of high intensity and medium intensity of weight training on selected speed parameters. To achieve this purpose of the study 45 untrained boys studying in the government her sec school, Chidamdaram were selected as subjects at random. Their age ranged between 14 to 16 years. The selected subjects were divided into three equal groups of fifteen each. The experimental group- I underwent high intensity weight training, group- II underwent medium intensity weight training, for three days per week for twelve weeks whereas the group-III act as control group. The following variable namely speed, stride length and stride frequency was selected as criterion variable. The collected data were analyzed statistically through analysis of covariance (ANCOVA) to fund out the significant difference, if any among the groups. Whenever the obtained "F" ratio was found to be significant, the scheffe's test was applied as post hoc test to find out the paired mean difference, if any. The 0.05 level of confidence was fixed to test the level of significance which was considered as an appropriate. The results of the study showed that there was a significant difference exists among high, medium, intensity weight training groups and control group on speed parameters. And also high intensity weight training group and medium intensity weight training group showed significant improvement on speed parameters when compared to control group.*

**Keywords:** Weight Training, Speed, Stride Length, Stride Frequency.

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### Introduction

Scientific training methods and application of basic principles of body mechanics in sports skill have been attributed to the higher level of performance in sports skills. Performance is the combined result of coordinated exertion and integration of a variety of functions. Genetic factor probably plays an important role in an individual's performance. Moreover performance to a certain extent depends upon the physical and motor fitness qualities in which definite improvement can be achieved through appropriate training. Training methods and procedures to select athletes to sports that are suitable to them have been markedly revolutionized. The rapid progress made in the understanding of the mechanism involved in the adaptation of athletes to different training procedures has significantly contributed to the development of various training methods. Variations in these training methods have been introduced to make them appropriate and to achieve specific performance objectives. Therefore, training methods and techniques are generally used according to the degree of the involvement of different

element of fitness in any sports performance. The word training has been a part of human language since ancient times. It denotes the process of preparation for some task. This process invariably extends to a number of days and even months and year. The Basic training procedures will serve better when utilized with modification suited to individuals or a group dealt with. The training programme should look into improving the performance of the athletes and at the same time should prevent injury from taking place (Fox, 1985).

The sports training aim at finding hidden reserves and make the sports person aware of it. It also aims at grater development of the reserves. The sports person controls their day to day routine in such a manner that they are able to do training once or twice a day with high effect. It is a continuous process of perfection, improvement and criterion of means and methods of improving sports performance and factors of performance. Weight training is a use of resistance other than weight of the body to develop specific areas of the body. Generally, it is used to develop muscular strength and power. It also develops muscular endurance elasticity and co-ordination. Weight training is the use of systematic exercises with weight and it is used merely as a mean to increase resistance of the muscle contraction. The primary objective is not to learn to lift as much

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weight as possible, but to increase strength and power for application to some other sports.

Weight training refers to an interest in physical fitness or importance of strength in a particular sports. It is not usually an end in itself but as a means to an end. The subject of weight training is a controversial one. Many physical educationists believe it makes participants “muscle bound” but, muscles in a permanent state of partial, limits reduces speed, causes the learning of sports skills. The essentials of weight training (strength training) and regularity and gradual increase in training intensity (principles of over loading) supported by good nutrition and adequate rest unlike endurance training, weight training does not spend many calories. As such, its role of reducing body weight is limited. On the other hand, weight due to muscle hypertrophy. Strength training doesn’t mean one will lose flexibility or become muscle bound. It has also been established that increase in muscular speed (Explosive power) accompanies an increase in muscular strength. It is generally agreed and accepted that muscles increase in exercise through weight training that strength is increased, that chemical changes take place and to some extent perhaps that the speed of muscular contraction is also increased. A great deal has been said both for and against weight lifting and weight training as a means of conditioning athletes for optimum physical performance. However recent studies seem to show the possible relationship between weight training and an increase in such factors as speed, power, strength, flexibility and endurance. The investigator makes an attempt to study the effects of different intensities of weight trainings on selected speed parameters. Sprinting speed is determined by the length of stride and stride frequency (speed of stride). Length of stride depends primarily upon leg length and leg power. Leg speed and frequency mostly depend upon speed of muscle contractions and neuromuscular co-ordination. Researcher demonstrated that the length of stride rather than the rate of acceleration of the leg is the main limitation in sprinting. It is known that length of stride can be increased by increasing leg power, which is the ability to apply more

force rapidly and thereby project the body faster and further with each stride. Leg speed is innate, but stride length can be improved by increasing muscular strength and mobility (Jensen, 1979).

### Methodology

The purpose of the study was to find out the persuade of high intensity and medium intensity of weight training on selected speed parameters namely speed, stride length and stride frequency. To achieve this purpose of the study 45 untrained boys studying in the government her sec school, Chidamdaram were selected as subjects at random. Their age ranged between 14 to 16 years. The selected subjects were divided into three equal groups of fifteen each. The experimental group- I underwent high intensity weight training and group- II underwent medium intensity weight training for three days per week for twelve weeks whereas the group-III act as control group. The following variable namely speed, stride length and stride frequency was selected as criterion variable. The subjects of the four groups were tested on speed parameters at prior and immediately after the training period. The experimental group- I underwent high intensity weight training, group- II underwent medium intensity weight training, for three days per week for twelve weeks. Every day the workout lasted for 45 to 60 minutes approximately including warming up and warming down periods. Group- III acted as control who did not participate in any strenuous physical exercises and specific training throughout the training period.

### Analysis of Data

The collected data were analyzed statistically through analysis of covariance (ANCOVA) to find out the significant difference, if any among the groups. Whenever the obtained “F” ratio was found to be significant, the scheffe’s test was applied as post hoc test to find out the paired mean difference, if any. The 0.05 level of confidence was fixed to test the level of significance which was considered as an appropriate.

## Results

**Table I.** Computation of Analysis of Covariance on Speed

	High Intensity Training Group (Sec.)	Medium Intensity Training Group (Sec.)	Control Group (Sec.)	Source of Variance	Sum of Squares	Df	Mean Squares	F-Ratio
Pre Test Mean	7.12	7.00	6.89	Between	0.47	2	0.22	1.07
				Within	8.95	42	0.20	
Post Test Mean	6.35	6.67	6.84	Between	1.78	2	0.89	4.93*
				Within	7.76	42	0.18	
Adjusted Post Test Mean	6.27	6.66	6.98	Between	3.11	2	1.54	18.07*
				Within	3.33	41	0.08	

The required table value for significant at 0.05 level of confidence for 2 and 42 (df) =3.22, 2 and 41 (df) =3.23. \*Significant.

As shown in table- I the pre test means on speed of high intensity weight training, medium intensity weight training groups and control group are 7.12, 7.00 and 6.89 respectively. The obtained 'F' ratio value on the scores of pre test means 1.07 was lesser than the required F ratio value, which proved that the random assignment of the subjects were successful and their scores in speed before the training were equal and there was no significant differences. The post test means on speed of high intensity weight training, medium intensity weight training groups and control group are 6.35, 6.67 and 6.84 respectively. The obtained post test 'F' ratio value of 4.93 was greater than the required table value of 3.22 for significance at 0.05 level of confidence with degrees of freedom 2 and 42. It reveals that significant

differences existed between the groups after twelve weeks of training. The adjusted post test means on speed of high intensity weight training, medium intensity weight training groups and control group are 6.27, 6.66 and 6.98 respectively. The obtained 'F' ratio value 18.07 was greater than the required table value of 3.23 for significance at 0.05 level of confidence with degrees of freedom 2 and 41. The result of the study shows that significant differences existed between the adjusted post test mean of the high intensity weight training, medium intensity weight training and control groups in improving the speed. Since the adjusted post test mean 'F' value was found to be significant, the results were subjected to post hoc analysis using Scheffe'S test. The results were presented in table- II.

**Table II.** Scheffe'S Paired Mean Test Scores on Speed

ADJUSTED POST TEST MEANS				Confidence Interval
High Intensity Training Group	Medium Intensity Training Group	Control Group	Mean Difference	
6.27	6.66	---	0.39*	0.26
6.27	---	6.98	0.71*	0.26
---	6.66	6.98	0.32*	0.26

\* Significant

The post hoc analysis of ordered adjusted post test means proved that significant differences existed between high intensity weight training and medium intensity weight training groups; high intensity weight training and control groups; and medium intensity weight training and control groups, since the mean differences (0.39, 0.71 and 0.32) were greater than the

confidence interval value of 0.26. This proved that due to twelve weeks of high and medium intensity weight training the speed of the subjects improved significantly. While considering the two training methods, it was found that high intensity weight training was better than medium intensity weight training in improving speed.

**Table III.** Computation of Analysis of Covariance on Stride Length

	High Intensity Training Group (cm.)	Medium Intensity Training Group (cm.)	Control Group (cm.)	Source of Variance	Sum of Squares	Df	Mean Squares	F-Ratio
Pre Test Mean	180.132	178.601	180.066	Between	22.533	2	11.267	0.168
				Within	2804.267	42	66.768	
Post Test Mean	183.734	180.932	180.000	Between	113.244	2	56.622	0.924
				Within	2575.867	42	61.330	
Adjusted Post Test Mean	183.230	181.873	179.562	Between	103.327	2	51.664	22.988*
				Within	92.143	41	2.247	

The required table value for significant at 0.05 level of confidence for 2 and 42 (df) =3.22, 2 and 41 (df) =3.23. \*Significant.

As shown in table III the pre test means on stride frequency of high intensity weight training, medium intensity weight training groups and control group are 180.132, 178.601 and 180.066 respectively. The obtained 'F' ratio value on the scores of pre test means 0.168 was lesser than the required F ratio value,

which proved that the random assignment of the subjects were successful and their scores in stride length before the training were equal and there was no significant differences. The post test means on stride length of high intensity weight training, medium intensity weight training groups and control group are 183.734, 180.932

and 180.00 respectively. The obtained post test 'F' ratio value of 0.924 was lesser than the required table value of 3.22 for significance at 0.05 level of confidence with degrees of freedom 2 and 42. It reveals that no significant differences existed between the groups after twelve weeks of training. The adjusted post test means on speed of high intensity weight training, medium intensity weight training groups and control group are 183.230, 181.873 and 179.562 respectively. The obtained 'F' ratio value 22.988 was greater than the

required table value of 3.23 for significance at 0.05 level of confidence with degrees of freedom 2 and 41. The result of the study shows that significant differences existed between the adjusted post test mean of the high intensity weight training, medium intensity weight training and control groups in improving the stride length. Since the adjusted post test mean 'F' value was found to be significant, the results were subjected to post hoc analysis using Scheffe'S test. The results were presented in table IV.

**Table IV.** Scheffe'S Paired Mean Test Scores on Stride Length

ADJUSTED POST TEST MEANS				Confidence Interval
High Intensity Training Group	Medium Intensity Training Group	Control Group	Mean Difference	
183.230	181.873		1.357	1.391
183.230		179.562	3.668*	1.391
	181.873	179.562	2.311*	1.391

\* Significant

The post hoc analysis of ordered adjusted post test means proved that there was no significant differences existed between high intensity weight training and medium intensity weight training groups. There was significant differences between high intensity weight training and control groups; and medium intensity weight training and control groups, since the mean differences (3.668, and 2.311) were greater than

the confidence interval value of 1.391. This proved that due to twelve weeks of high and medium intensity weight training the stride length of the subjects improved significantly. While considering the two training methods, it was found that high intensity weight training was better than medium intensity weight training in improving stride length.

**Table V.** Computation of Analysis of Covariance on Stride Frequency

	High Intensity Training Group (Nos.)	Medium Intensity Training Group (Nos.)	Control Group (Nos.)	Source of Variance	Sum of Squares	Df	Mean Squares	F-Ratio
Pre Test Mean	3.173	3.180	3.180	Between	0.0004	2	0.0002	0.007
				Within	1.357	42	0.032	
Post Test Mean	3.273	3.307	3.207	Between	0.078	2	0.039	1.268
				Within	1.288	42	0.031	
Adjusted Post Test Mean	3.277	3.305	3.205	Between	0.080	2	0.040	3.595*
				Within	0.455	41	0.011	

The required table value for significant at 0.05 level of confidence for 2 and 42 (df) =3.22, 2 and 41 (df) =3.23.

\*Significant.

As shown in table V the pre test means on stride frequency of high intensity weight training, medium intensity weight training groups and control group are 3.173, 3.180 and 3.180 respectively. The obtained 'F' ratio value on the scores of pre test means 0.007 was lesser than the required F ratio value, which proved that the random assignment of the subjects were successful and their scores in stride length before the training were equal and there was no significant differences. The post test means on stride frequency of high intensity weight training, medium intensity weight training groups and control group are 3.273, 3.307 and 3.207 respectively. The obtained post test 'F' ratio value of 1.268 was lesser

than the required table value of 3.22 for significance at 0.05 level of confidence with degrees of freedom 2 and 42. It reveals that no significant differences existed between the groups after twelve weeks of training. The adjusted post test means on speed of high intensity weight training, medium intensity weight training groups and control group are 3.277, 3.305 and 3.205 respectively. The obtained 'F' ratio value 3.595 was greater than the required table value of 3.23 for significance at 0.05 level of confidence with degrees of freedom 2 and 41. The result of the study shows that significant differences existed between the adjusted post test mean of the high intensity weight training, medium

intensity weight training and control groups in improving the stride frequency. Since the adjusted post test mean 'F' value was found to be significant, the results were

subjected to post hoc analysis using Scheffe'S test. The results were presented in table VI.

**Table VI.** Scheffe'S Paired Mean Test Scores on Stride Frequency

ADJUSTED POST TEST MEANS				Confidence Interval
High Intensity Training Group	Medium Intensity Training Group	Control Group	Mean Difference	
3.277	3.305		0.028	0.08
3.277		3.205	0.072	0.08
	3.305	3.205	0.100*	0.08

\* Significant

The post hoc analysis of ordered adjusted post test means proved that there was no significant differences existed between high intensity weight training and medium intensity weight training groups. There was no significant differences between high intensity weight training and control groups, since the mean differences (0.072) were lesser than the confidence interval value of 0.08. There was significant differences existed between medium intensity weight training and control groups, since the mean differences (0.100) were greater than the confidence interval value of 0.08. This proved that due to twelve weeks of medium intensity weight training the stride frequency of the subjects improved significantly.

### Discussion on Findings

The results of the study showed that there was a significant difference among high intensity weight training, medium intensity weight training and control groups on selected speed parameters such as speed, stride length and stride frequency. The results of the study further showed that there was a no significant difference between high intensity weight training group and medium intensity weight training group. The benefits of strength training include increased muscle, tendon and ligament strength, bone density, flexibility, tone, metabolic rate and postural support. And also it was found that there was significant improvement on selected strength parameters namely arm strength, leg strength and back strength. The present stud was supported by Delecluse and others found the improvement on speed parameters due to weight training..

### Conclusion

1. The high and medium intensity weight training groups have demonstrated significant increase on speed when compared to control group.
2. It was also concluded that the subjects who followed high intensity weight training were significantly better than the subjects who followed medium intensity weight training in improving speed.

3. The high and medium intensity weight training groups have demonstrated significant increase on stride length, when compared to control group.
4. It was also concluded that there was no significant differences between high and medium intensity weight training groups in improving stride length.
5. The result of the study reveals that medium intensity weight training groups have demonstrated significant increase on stride frequency, when compared to control group.
6. The result of the study also reveals that there was no significant improvement found in stride frequency due to the effect of high intensity weight training.

### References

1. Arnhein, Daniel D. (1985). Modern Principle of Athletic Training, St. Louis: The Mosby College Publishing Co., p.78.
2. Baechle, Thomas R. (1994). Essentials of Strength Training and Conditioning, Champaign: Human Kinetics, p.248.
3. Bompa, Tudor O. (1999). Periodization: Theory and Methodology of Training, (4th ed), (Champaign, Illinois: Human Kinetics Publishers, p. 24.
4. Broota K.D., (1989). Experimental Design in Behavioral Research, Delhi: Wiley Eastern Limited, p.301.
5. Brown, Lee E., Vance A. Ferrigno, and Juan Carlos Santana. (2000). Training for Speed, Agility, and Quickness, Champaign: Human Kinetics, p.19.
6. Clarke, H. Harrison, (1976). Application of Measurement to Health and Physical Education, (5<sup>th</sup> ed.), Englewood Cliffs, New Jersey: Prentice Hall Inc.
7. Dick, Frank W. (1992). Sports Training Principles, Cambridge, University Press.
8. Fox, Edward L. (1984). Sports Physiology, Philadelphia: Saunders College Publishers
9. Singh, Hardayal. (1991). Science of Sports Training, New Delhi: D.V.S. Publications P. 13.
10. Jensen, Clayne, R and A. Garth Fishes. (1979). Scientific Basis of Athletic Conditions,

- Philadelphia: The Lea and Febiger Publishers, pp. 189-190.
11. Delecluse, C. et al., (1995). "Influence of High-Resistance and High-Velocity Training on Sprint Performance", *Medicine and Science in Sports and Exercise*, 27, pp.1203-1209.
  12. Eicher, Tom. (1975). "Improving Sprinting Speed through Strength Training", *Athletic Journal*, 65, p .12.