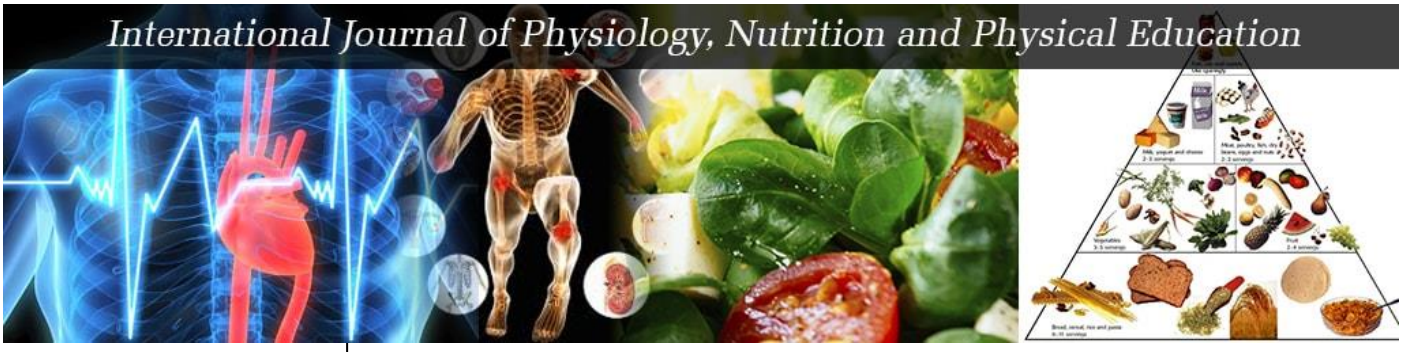

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Effect of Submaximal and maximal training on performance of jumpers

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Abstract
The present study was to determine the effect of submaximal and supramaximal training on the performance of sprinters. The subjects were sixty male sprinters of 18 to 25 years of age, from L.N.U.P.E., Gwalior. The subjects were randomly selected and were assigned to two experimental groups i.e. submaximal and maximal groups and control group, with 20 subjects in each group. The training was given for a period of 12 weeks. The two experimental groups were trained upto six days in a week, while the control group continued with their daily routine work. The selected variables were the performance of subjects in long jump and triple jump. The pre- and post-test were conducted. After the collection of data, analysis of covariance was used to identify significant difference between the groups. The LSD post hoc test was used to identify significant differences between the training programmes. The level of significance was set at 0.05.

Keywords: Submaximal, maximal, performance of jumpers

Introduction
Track and field gained popularity because of its similarity with daily life. Sprinting speed is the capacity of the individual to perform successive movements of the same pattern at a fast rate. Sprinting speed demand effort plus style involving the study and practice of the technique. Training is not a recent discovery. In ancient times, people systematically trained for military and Olympic endeavours. Today athletes prepare themselves for a goal through training. Training in games and sports is no longer a myth and does not have a casual approach; it provides opportunities for scientific process and verification. Training has been accepted as a highly specialized science. In the recent years, greater stress has been laid on the quality rather than the quantity of training. Sports scientists and experts want their sportsman to extract maximum achievement from their training procedure without causing too much strain on them. This is possible only if coaches and teachers of physical education apply the most economical manner for enhancing the performance of athletes. Sprinting is the fullest form of running performed over short distances in which maximum or near maximum effort can be sustained. Track and field events need tremendous strength for good performance. It would be better to find out the same through isometric and isotonic exercises. The vital need of all sprinters is tremendous leg power, necessary for the fastest possible leg speed.

Objective of study
The purpose of the study is to find out the effect of submaximal and Smaximal training on performance of sprinters.

Methodology
Selection of Subjects
The subjects for this study were selected from the Lakshmibai National University of Physical Education, Gwalior. Sixty-seven male athletes who had participated in inter-university and state level competitions ranged from 18–25 years of age, were selected for the experimental programme utilizing the purposive sampling technique. A medical examination of the subjects was carried out in order to check the fitness of the subjects. Four subjects from the maximal group, two from the submaximal and one from the control group discontinued due to injury during the course of training.

So out of sixty subjects, twenty each were selected on random basis for submaximal training, maximal training and control group.

Selection of Variables

Keeping in mind the feasibility criteria and specific purpose of the study. The performance of long and triple jumps performance were measured in meters.

Experimental Design

Pre-test and post-test randomized group design was employed in this study; both subjects as well as the experimental treatments were randomly assigned to the two experimental groups and one control group. The initial tests were conducted, followed by 12-weeks of selected training programmes. After completion of the experimental period, the final tests were conducted.

Analysis of Data

In order to find out the effect of submaximal and supramaximal training on performance of sprinters, analysis of co-variance was used. The level of significance was 0.05.

Findings

In order to determine the significance difference between experimental groups and control group, the pre test and post test scores were collected. The initial and final test scores were analysed using ANCOVA. The results of the study are presented in tables and figure for each selected parameter of performance of sprinters are shown.

Table 1: Descriptive Statistics Showing Mean and Standard Deviation of Jumperts Performance of Different Groups

S.N.	Group	N	Mean (sec.)	S.D.
1.	Control	20	11.324	0.125
2.	Submaximal	20	11.379	0.086
3.	maximal	20	11.048	0.144

Table 1 reveals that the Mean and Standard Deviation of control, submaximal and maximal were 11.324+0.125, 11.379+0.086 and 11.048+0.144 sec. respectively.

Table 2: Descriptive Statistics Showing the Adjusted Mean and Standard Deviation of Jumpers Performance of Different Groups

S.N.	Group	Mean (sec.)	S.D.	95% Confidence Interval	
				Lower Bound	Upper Bound
1.	Control	11.336	0.023	11.291	11.382
2.	Submaximal	11.315	0.026	11.263	11.367
3.	maximal	11.100	0.025	11.050	11.150

Table 2 indicate the adjusted post mean and standard deviation of control, submaximal and maximal groups are 11.336+0.023, 11.315+0.026, 11.100+0.025 sec. respectively.

Table 3: Analysis of Co-variance of Comparison of Adjusted Post Test Means of Experimental Group and Control Group in Jumpers

	Sum of Squares	*df*	Mean Square	*f*	Sig.
Between the groups	0.560	2	0.280	27.224*	0.000
Error	0.576	56	0.010		

* Significant at 0.05 level.

F 0.05 (2, 56) = 2.39

p<0.05

Table 3 reveals that there was a significant difference among maximal, submaximal and control group of 100 meters performance as calculated value (27.22) was more than the tabulated value (2.39) at 0.05 level of significance. Table further shows that probability error is 0.000 which is p< 0.05.

Table 4: Comparison of Adjusted Post Test Means of three Experimental Group and Control Group in Jumpers

Group	Group	Mean Difference	Sig.
Control	maximal	0.236*	0.000
	Submaximal	0.021	0.553
Submaximal	Control	-0.021	0.553
	maximal	0.215*	0.000
maximal	Control	-0.236*	0.000
	Submaximal	-0.215*	0.000

*Significant at 0.05 level.

Table 4 shows adjusted post test means of two experimental groups i.e. submaximal, maximal and control groups. The adjusted means of submaximal, maximal and control group were 11.315, 11.100 and 11.336 respectively. The mean difference between submaximal and maximal group is 0.215 significant p< 0.05. However, the insignificant difference is obtained between control group and submaximal group. As the obtained mean difference is 0.021 where is probability of error p>0.05.

Table further exhibited the significant difference between maximal group and control group as the obtained mean difference is -0.236 against the critical value of 0.049 at 0.05 level. Table has clearly shown that the supramaximal group is significantly superior than the submaximal group and control group. However, the submaximal and control group has not shown any significant difference.

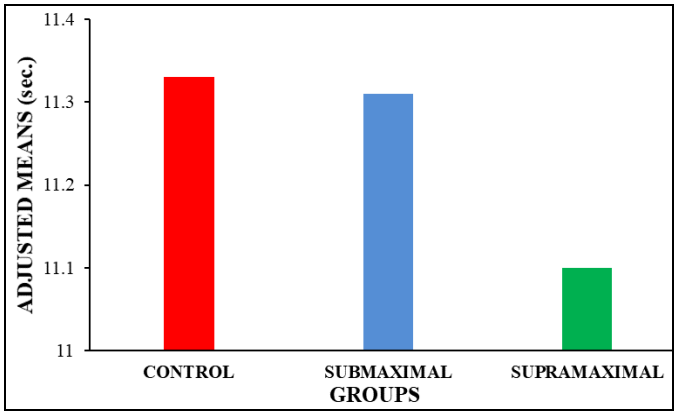

Fig 1: Bar Diagram Showing Descriptive Statistics of Adjusted Means of Different Groups in 100 Meters Run

Discussion of Finding

The results, in general, show that submaximal and maximal training improve performance of Jumpers. It was found that the experimental groups improved significantly. No significant differences were found in the control group. The results show, that the subjects who followed the treatment of submaximal and maximal training improved their performance of sprinters.

The maximal training included repetition runs, weight training, plyometric training and elastic catapull runs. Exercise in the supramaximal zone of intensity relies almost exclusively on anaerobic metabolism. This intensity zone is characterized by highest power outputs and is considered the highest intensity of exercise which is substantially higher than the athlete's VO_2 max. The phosphagen (ATP–PC) system is the primary supplier of energy in the maximal zone. The reliance on anaerobic energy supply is due to the rapid demand for energy, which cannot be met by aerobic mechanism. This deficit is covered by Excess Post-exercise Oxygen Consumption (EPOC) to replenish the ATP or PC stores. Training performed in this intensity zone is usually

limited by the muscular stores of ATP and PC (Bompa and Haff). No improvement in submaximal training over control group was seen in long jump and triple jump performance is basically based on the cardio-respiratory anaerobic ability, and the training within the submaximal range was covering upto 70% of the intensity, which might not be sufficient for the improvement of anaerobic capacity of the individuals, which is the basis for Jumpers performance.

Conclusions

On the basis of findings of the study, the following conclusions were drawn:

1. Twelve-week submaximal and maximal training programmes are useful to improve the performance of sprinters.
2. The maximal training programme has a greater effect in comparison to submaximal training programme on the performance of sprinters.

References

1. Barrow HM, Mcgee R. A Practical Approach to Measurement in Physical Education, 3rd Ed., (Philadelphia: Lea and Febiger,), 1979
2. Billat LV. Interval training for performance: A scientific and empirical practice. Special recommendations for middle and long-distance running. Part II: Anaerobic interval training. Sports Medicine, 2001, 31.
3. Bompa O Tudor, Haff Gregory G. Periodization Theory and Methodology of Training, Human Kinetics, V-Edition, 2009.
4. Frank W Dick, Sports Training Principles, Fourth Edition, Henry Kempton (Publishers) Ltd., 2003.
5. Hardayal Singh. Science of Sports Training New, Delhi: D. V. S. Publications, 1991.
6. Hardayal Singh. Science of Sports Training, New Delhi: D. V. S. Publications, 1991.
7. Johnson L, Nelson K. Practical Measurements for evaluation in Physical Education, 3rd Ed. (Delhi: Surjeet Publication), 1988.
8. Johnson L, Nelson K. Practical Measurements for evaluation in Physical Education, 3rd Ed., (Delhi: Surjeet Publication), 1988
9. Verma JP, Ghufran Mohammad. Statistics for psychology comprehensive text, (Tata McGraw Hill Education Private Limited: New Delhi, 2012.
10. William D McArdle, Frank L Katch, Victor L Katch. Exercise Physiology: Exercise Nutrition and Human Performance, Fifth Edition, 1996.