
EFFECT OF CONCURRENT TRAINING ON PERFORMANCE PARAMETERS OF 10 METER AIR PISTOL SHOOTERS



Singh Ajay Charak*



Kanwar Ramesh Chand**

*Research Scholar; RTM Nagpur University, Nagpur (M.S)-INDIA.

**Research Supervisor, Nagpur (M.S)-INDIA.

E. Mail: jchrak@gmail.com

Abstract:

The main objective of the study was to investigate the effects of concurrent training on performance parameters of 10 meters air pistol shooters. 40 male shooters age between 16-22 years were selected as samples for the study from Nagpur by purposive sampling and were randomized into two groups i.e. experimental and control group. Single group pretest posttest group design was used to assess performance parameter. Concurrent training was given on alternate day's means three days for concurrent activities every week for six weeks. Pretest and posttest was taken before and after training program. The change in performance mean and standard deviation of experimental group was (20.50 ± 6.151) , while the change in performance mean and standard deviation of control group was (1.60 ± 3.45) . The calculated 't' value of performance was 11.980. The calculated 't' values for performance parameters were found statistically significant at 0.05 level ($p = 0.001$). From the above results it can be concluded that six week concurrent training program was effective to improve the performance skill of 10 meter air pistol shooters.

Keywords: Concurrent Training, Performance Parameters & Air Pistol Shooters.

Introduction:

In the present world, Sports have become extremely competitive. It is not mere participation or practice that makes an individual victorious. Qualitative sports life is affected by various factors like physiology, biomechanics, sports training, sports medicine, sociology and coaching, computer application and psychology and so on. To achieve top level performance in the international arena one must have a fitness regimen and systematic execution. To win medals, in the Olympics, there should be spotting of talent, systematic and scientific method of training, competitive exposure, etc. It is not only because of training, but also because of psychological, and physiological aspects that goals are achieved. Shooting originated as a means of survival, and it was practiced in order to hunt game for food. Shooting is an Olympic sport. The International Sport Shooting Federation, ISSF, is the governing body for shooting competitions throughout the world. There are 19 different categories of shooting competitions of

shooting recognized at the Olympic game. The objective of sports shooting is to deliver a number of perfectly executed shots to a target usually within a given time limit. Concerning the discipline “10 Meter Air Pistol” is an Olympic shooting event governed by the International Shooting Sport Federation (ISSF). The air pistol event was introduced on the World Championship level in 1970 and on the Olympic programmed in 1988. The pistols used are gas-driven with a caliber of 4.5 mm (.177 in). The pistol must be operated by only one hand from a standing position, and may only be loaded with one pellet at a time. For the 10 meter air pistol and air rifle disciplines match diabolic pellets are used. To facilitate maximum performance out of various air guns the leading match pellet manufacturers produce pellets with graduated "head sizes", which means the pellets are offered with front diameters from 4.48 mm up to 4.51 mm.

Background of the Study:

Shooting is an Olympic sport, with different categories. Standing Air Rifle and Pistol Shooting are among the most technical of these, with both disciplines requiring extreme precision for success. From a standing position, the shooter must aim at a target located 10 meters away which, in the case of rifle shooting, has a “bull’s eye”, 1mm wide. Not surprisingly then, the smallest of movements will significantly affect shooter’s score. To successfully compete in this demanding sport, an intensive training of the correct technique is necessary. Once each part of the correct technique is learned and can be properly executed by the shooter, all these elements are to be used in a coordinated and systematically way, otherwise there will be no expected and wished output. Two major factors affecting accuracy are the heart rate and breathing. The sport of target shooting involves three factors-heart rates, breathing, and calm nerves are of paramount importance in all shooting sport. All fundamentals of pistol shooting such as position, grip, sight alignment, breath control, trigger control, physical condition, and psychology of shooting, when perfected, simply enables the shooter to perform. In order for a shot to be accurate, it is necessary to make sure that the pistol will be held as motionless as possible to do so during the time that the shot is being fired the stance used by the shooter must provide the greatest stability possible for both the shooter’s body and the pistol. In order to keep the pistol as immobile as possible the shooter must hold the breath for the length of time required to deliver an accurate shot. Some of this movement is physiological tremor. Tremor size has a demonstrable inverse correlation with shooting performance. Consequently, factors which affect tremor size should affect shooting ability. So as to control physiological tremor physical condition requirements for shooting involves the precise coordination of mental, muscle, eye, and nervous system functions at the same time is also very important to keep all the body functions as calm as possible in order to prevent the body from moving or wobbling, as to attainment of the minimum arc of movement. When the shooter is first getting his sight alignment and has not yet had time to settle his body and pistol, the extent of the movement is relatively great. As the body becomes balanced and the aiming is more precise, the arc of

movement minimizes. After a certain length of time, the minimum arc of movement begins to increase, because the muscles begin to fatigue, and the shooter does not have enough air in his lungs to continue holding his breath. To help the shooter acquire the necessary knowledge to master all the factors that controls his shooting. A training program is required to tone the shooter physically to withstand the rigor of shooting sports.

Concurrent Training:

Concurrent training is a method that consists of training multiple qualities at equal amounts of focus within the same training phase and often within the same workout. Concurrent training is training for both strength and endurance, in an effort to achieve the ultimate physical fitness and optimum athletic performance on both aspects of training. Different types of training (for example, aerobic training and strength training) carried out during the same training session. Aerobic system to maintain a lower resting heart rate and ensures shooter can perform at their best for extended periods, by concurrent method.

Isometric Training:

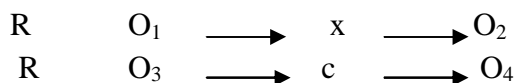
Isometric exercises, also known as static strength training, involve muscular actions in which the length of the muscle does not change and there is no visible movement at the joint. The term 'static contraction training' is sometimes used to describe isometrics. However, 'contraction' signifies a change in length (shortening) of the muscle belly, which does not occur during static strength training. The term 'static action' is preferred to static contraction. Isometric exercises can be used for general strength conditioning.

Objective of the Study:

The main objective of the study was to investigate the effects of concurrent training on performance parameters of 10 meters air pistol shooters.

Materials and Method:

As researcher wanted to study combine effect of concurrent training on the performance parameter of 10 meter air pistol shooters, the study was conducted by experimental method. For the present study pretest-posttest equivalent group design was used to measure performance parameter

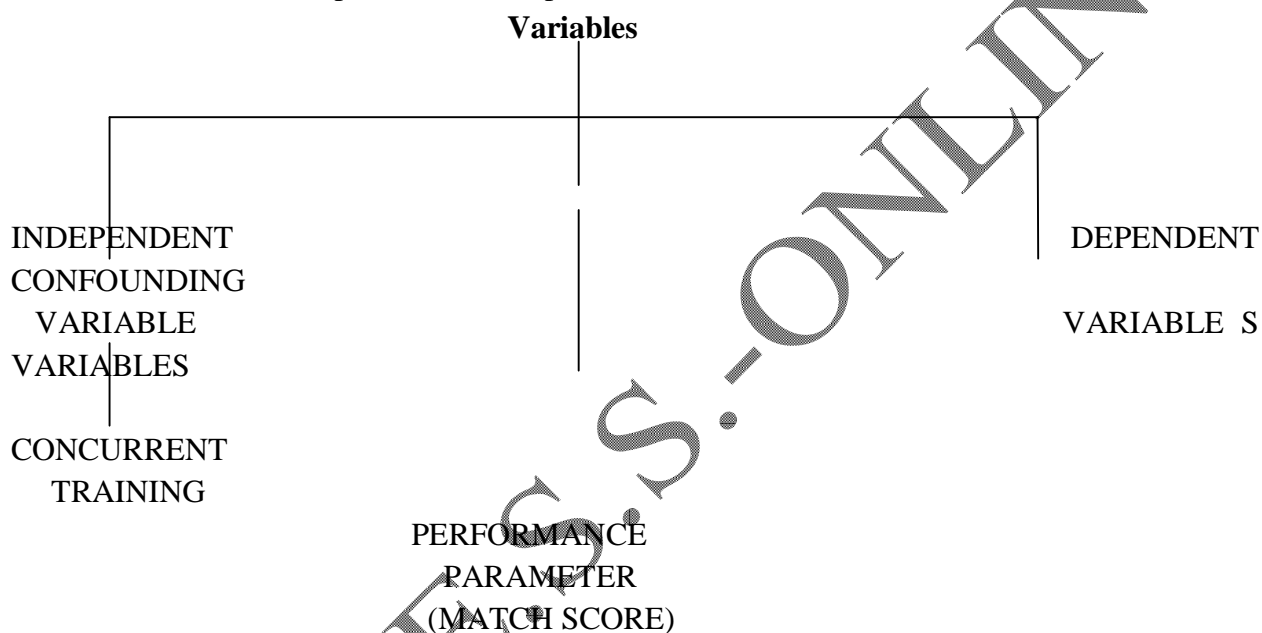


pretest-posttest equivalent group design in which 'X' were experiment group and 'c' was control group and the treatment and O₁ and O₃ represents the pretest and O₂ and O₄ assess posttest respectively. The difference between the pre test and posttest scores were taken as an index of the treatment condition.

A group of research participants were measured on the dependent variable, O₁, prior to administration of treatment condition. The independent variable, X, was then administrated,

and the dependent variable, O₂, was again measured. The difference between the pre test and posttest scores were taken as an index of the treatment condition.

All the air pistol shooters between age group 16-22 years of Nagpur were the population of the study (N=100). To achieve the purpose of the study, purposively sampling technique was used. A sample of 40 male subjects was selected with the help of purposively sampling as subject for the present study. Subjects were further dispersed in two groups randomly i.e. 20 in experimental and 20 in control group. Variables are the conditions or characteristics that the experimenter manipulates, controls or observes.



The researcher selected 40 male students of 16-22 years old using purposive sampling technique, and subjects were randomly selected for control and experimental groups. After grouping, matches were conducted for pre-test score of performance of control and experimental group. Then the six week training program was conducted on experimental group; training was given on alternate days in a week. After the completion of six week training program the performance matches of both experimental and control group were held for post-test score. The data collected was analyzed by using SPSS and results were drawn.

Tools for data collection

Performance Variables
Performance score

Tools
40 shots match

Units
Total scores out of 400.
(each shot 10 scores)

Results and Discussion:

For testing the hypothesis of homogeneity of group mean gains, as well as significance of differences of pairs of group means, the level of significance was set at 0.05 level of confidence, which was considered adequate for the purpose of this study. The obtained results were presents in the following tables which represents the result of descriptive analysis, correlation and comparison.

Analysis of Change in Performance:

Table No: I

Descriptive Statistic of Performance of Experimental and Control Groups

Group	N	Mean(score)	Std. Deviation	Std. Mean	Error
Experimental	20	20.50	6.15	1.37	
Control	20	1.60	3.45	0.77	

Table shows that there were 20 subjects each in experimental and control group. The mean gain in Performance scale for experimental group was 20.50 with standard deviation of 6.15 similarly, for the control group the mean gain in similar variable was 1.60 with standard deviation of 0.77

Table No: II

Independent Samples Test of change in performance of air pistol shooters of Experimental and Control Group

Levene's Test for Equality of Variances			t-test for Equality of Means		
F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
3.75	0.06	11.980	38	0.001	18.90

The Leven's test for equality of variance when applied to the change in performance of 10 meter air pistol shooters scale for experimental group and control group, the F value was found to be 3.75 which were not statistically significant. Hence variance of change in experimental group and control group were equal.

The mean of change in performance of experimental and control group were compared with independent t-test. The mean difference was 18.90 and 't' value was 11.98 with degree of freedom 38 which was statistically significant at 0.05significance level (p=0.001).This indicates that there was significant effect of 6 weeks concurrent training on the performance parameter of Experimental group.

Discussions on Findings:

From the above analysis and interpretation of data following findings may be drawn:-

- Concurrent training improves performance of 10 meter air pistol shooters.

The aim of the present study was to evaluate the effect of the training program. It was observed from the findings that a statistical significant effect was seen due to which ultimately results in enhancing their performance in matches. The results of the study indicate that the experimental group namely concurrent training has significantly differs from the selected dependent variables from pre-test and post-test. It is also found that the improvement in performance as a mean of score causes by concurrent training was greater when compared with the control group. The effect of concurrent on performance was statistically significant in pretest and posttest of subjects. It is known fact that the concurrent training is best suited for developing physical fitness. It also increases the physiological profile. The present study also revealed that the above finding of the study was supported by Zanjani F.S, Cengiz A, Gaeini A.A, Tarssi Z, Rahbar B. compare sequence in the concurrent training with strength and endurance training alone and determine parameters that effect the changes in maximum power, body composition, and aerobic power and concluded that sequence and its application in the form of strength-endurance [SE] training will create the best effect. The study of Hakkinen K, Kraemer W.J, Gorostiaga E, suggest that even the low-frequency concurrent strength and endurance training leads to interference in explosive strength development mediated in part by the limitations of rapid voluntary neural activation of the trained muscles. Chromiak J.A, Mulvaney R.D examined the Effects of Combined Strength and Endurance Training on Strength Development recommended that the training of athletes takes into account the physiological demands of the sport and unique needs of the individual athlete in designing a training program in order to optimize performance. According to Nelson A G, Arnall D A, Loy S F, Silvester L J, simultaneous training may inhibit the normal adaptation to either training program when performed alone. The extent of the interference probably depends on the nature and intensity of the individual training program. Gillett and Elsenman in their study determined the effect of 16 weeks aerobic dance programme. Random assignment was given to experimental group and was concluded that a significant improvement was found in the physiological variables such as breath holding time and heart rate.

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