

## **EFFECTS OF INTENSIVE AND EXTENSIVE INTERVAL TRAINING ON SELECTED MOTORABILITY COMPONENTS, PHYSIOLOGICAL VARIABLES AMONG COLLEGE WOMEN STUDENTS**

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**ABSTRACT:** In the modern scientific age, sportsmen are being trained using highly sophisticated means for better achievement in their concerned sport. They are being exposed to the exercise and training methods which have proved beneficial for achieving high standards. The training programmes for sports are to be designed that they may favorably affect the physical and physiological variables associated with high performance capacity in that sport. The study was formulated as a true random group design. The subjects (n=30) were randomly assigned to three equal group of ten women each. The college women students of Alagappa College of Physical Education Karaikudi. They were divided into three equal groups namely Control Group (Group I) Intensive interval training (Group II) Extensive interval training (Group III). The subjects were tested in order to find out speed, Explosive power, Pulse rate, Breath holding time. The experimental group participated in intensive and extensive interval training for the period of six weeks. Dependent variables are Motor Ability Components (Speed, Explosive Power), Physiological Variables (Pulse rate, Breath holding time). Independent variables are Intensive interval training and Extensive Interval training. The pre and post test design employing ANCOVA technique was adopted. Intensive and Extensive interval training equally improved for the following factors of motor ability components namely speed, explosive power.

The six weeks of Intensive and extensive interval training might be significant improvement in speed, and explosive power, among the college women students. Intensive and extensive interval training equally improve for the following factors of physiological variables. The intensive and extensive interval training might be significant improvement of physiological variable resting pulse rate breath holding time among college women student.

**Key word:** Intensive Interval Training, Extensive Interval Training

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### **INTRODUCTION**

In these days of explosive population growth and advanced technology, considerable emphasis is being laid on educating a citizen to maintain optimum level of fitness for personal efficiency and national progress all over the world. The present days is an age of automation, sophistication and technological wonders which were beyond man's wildest dreams of a few years ago. In spite of all the powerful and ever increasing efforts on the part of medical science in recent years, to make man aware of the fact that preventive maintains of his body and especially of his heart is only way to assure a long and healthy life of modern man it has not been observed [1-2].

In the modern scientific age, sportsmen are being trained using highly sophisticated means for better achievement in their concerned sport. They are being exposed to the exercise and training methods which have proved beneficial for achieving high standards. The training programmes for sports are to be designed that they may favorably affect the physical and physiological variables associated with high performance capacity in that sport [3-4].

A variety of training procedures are adopted to develop the physical fitness with emphasis on developing on or other factors more intensively through any method which will have some effect on all qualities to be developed. The training methods can be identified as speed training. The endurance schedules of stress loads undertaken by trainer and athletes.

#### **MATERIALS AND METHOD:**

To execute this investigation, the research scholar employed random sample of thirty subjects drawn at random among the college of physical education women student, Karaikudi. Their age ranges from eighteen to twenty five years. They are divided in to three equal groups namely control group (Group I) Intensive Interval training (Group II) Extensive Interval training (Group III). The pre and post test design employing ANCOVA technique was adopted. The initial test on selected variable well recorded for three groups. The Group I control group did not involved any training. The Group II were given Intensive Interval training and the Group III were given Extensive interval training. The initial and final results were recorded. Dependent variables are Motor Ability Components (Speed, Explosive Power), Physiological Variables (Pulse rate, Breath holding time). Independent variables are Intensive interval training and Extensive Interval training for the period of six weeks. The training groups were classified as follows.

1. Experimental Group II (Intensive interval training 3 days)

2. Experimental Group III (Extensive Interval training 3 days)

Maximal heart rate method of detraining the intensity of interval training was employed for the experimentation. The extensive training was based on 60 to 80 percent of intensity. But the intensive interval training was based on 80 to 90 percent intensity. The running distance was classified as 100m,200m,300m,400m,the running distance was varied every day first 100m training second day 200m training third day 300m training fourth day 400m training , fifth day 100m again training and so on. The training was based on the interval method. The training schedule employed for an individual is presented below. This method was followed for the entire subject to determine the intensity of intensive and extensive interval training.

**TABLE - II**  
**INTENSIVE EXTENSIVE INTERVAL TRAINING WEEK SCHEDULE FOR AN INDIVIDUAL:**

Days	Distance Meter	Running time (Sec)	Pulse	Repetition	Recovery
I day	100 M	15 – 14 In 17 - 15 Ex	180-192 150-180	4 – 6 In 6 – 8 Ex	3 min 5 min
II day	200 M	32-29 Sec 35-32	180-192 150-180	4 – 6 6 – 8	3 min 5 min
III day	300 M	52 – 49 55 – 52	180-192 150-180	4 – 6 6 – 8	3 min 5 min
IV day	400 M	80 – 70 90 – 80	180-192 150-180	4 – 5 5 – 7	5 min 7 min
V day	100 M	15 – 14 17 - 15	180-192 150-180	4 – 6 6 - 8	3 min 5 min

**RESULTS :**

**TABLE – III : COMPUTATION OF ANALYSIS OF CO-VARIANCE OF SPEED**

	Control Group	Experimental group - I	Experimental group – II	SV	Source of squares	df	Mean of square	Obtained f- ratio
Pre test	7.93	8.05	7.95	B W	0.083 1.43	2 27	0.041 0.053	0.78
Post test	7.98	7.95	7.65	B W	0.59 1.38	2 27	0.292 0.051	5.711
Adjusted Post test mean	8.021	7.886	7.693	B W	0.542 0.280	2 26	0.271 0.011	25.189

Table F-ratio at 0.05 level of confidence for 2 and 27 (df) = 3.35 and 2 and 26 (df) = 3.37.

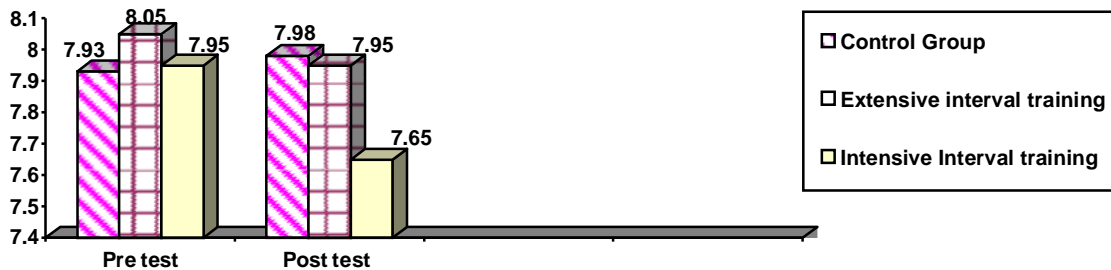
**TABLE – III a : COMPUTATION OF SCHEFFIS POST HOC TEST ORDERED ADJUSTED FINAL MEAN DIFFERENCES OF SPEED**

MEAN VALUE			Mean Difference	C.I	L.S
Control Group	Experimental group I	Experimental Group II			
8.021	7.886		0.135	0.129	
	7.886	7.696	0.19	0.129	
8.021		7.696	0.325	0.129	*

The analysis of covariance of speed indicate that Experimental group I intensive interval training and the experimental group II extensive interval training were significantly improved the speed.

Shaver (1982) stated that the speed is mainly determined by the characteristics of the muscles fibers arrangement of the bone and the attachments of bone by ligaments, tendons, and adequate muscles strength. It primarily depends on the show twitch fibers and fast twitch fibers. Fast twitch fibers are generally characterized by high anaerobic capacity rapid contraction. Short fatigue time and ability to generate relatively large force fatigue time and ability to generate low force fatigue time and ability to generate low force. Due to training the involvement of fast twitch fibers, enzymes, co-enzymes actins myosin. Hence there was significant improvement in speed.

**BAR DIAGRAM : SPEED**



**TABLE IV: COMPUTATION OF ANALYSIS CO-VARIANCE EXPLOSIVE POWER**

Groups	Control Group	Experiment al Group I	Experiment al Group II	SV	Sum of squares	df	Mean square	Obtained F ratio
Pre test mean	1.82	1.94	1.97	B W	0.14 0.34	2 27	0.070 0.013	5.634*
Post test mean	1.81	1.98	2.15	B W	0.59 0.31	2 27	0.294 0.011	25.686*
Adjusted Post test mean	1.88	1.95	2.10	B W	0.19 0.09	2 26	0.095 0.004	26.732*

**TABLE IV a: COMPUTATION OF SCHEFF’S POST HOC TEST ORDER**

Control Group	Mean Value		Mean difference	CI	L.S
	Experimental Group I	Experimental Group II			
1.881	1.954		0.073	0.07	
	1.954	2.098	0.114	0.07	
1.881		2.098	0.217	0.07	

The analysis of co-variance of explosive power indicated that Experimental group I (Intensive interval training) were insignificant and experimental group II (extensive interval training) were significantly improved the explosive power. Intensive and extensive training enhance both elastic and contractile components of the muscles. Hence it has been successfully used to enhance power. It may also be noted that interval training increasing the height of jumps that are proceeded by counter movements but no have important effects on jumps initiated from a static crouch position. The test employed to assess the elastic power (Bunny hops) involves dynamic nature of movements and this may be the reason for intensive extensive training having produced better results.

**BAR DIAGRAM : EXPLOSIVE POWER**



**TABEL – V :COMPUTATION OF ANALYSIS OF CO-VARIANCE OF PULSE RATE**

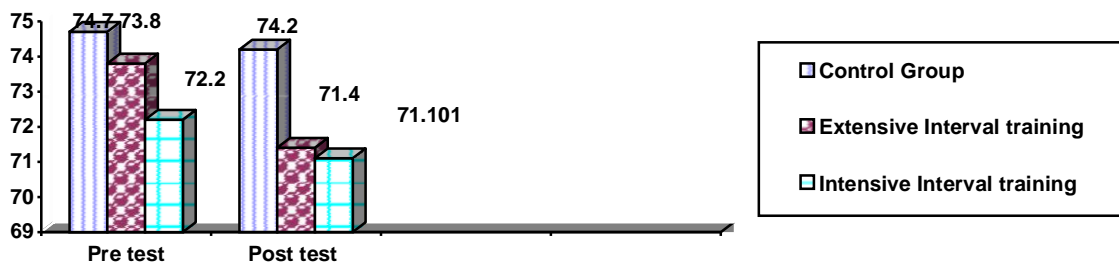
Groups	Contro l groups	Experime ntal Group I	Experime ntal Group II	SV	SS	df	Mean square	Obtaine d f ratio
Pre test mean	74.400	73.800	72.200	B W	25.867 229.60 0	2 27	12.933 8.504	1.521*
Post test mean	74.200	71.400	68.600	B W	156.80 228.40 0	2 27	78.400 8.459	9.268*
Adjusted post test mean	73.363	71.101	69.735	B W	61.376 43.933	2 26	30.688 1.690	18.162*

**TABLE – V a: COMPUTATION OF SCHEFF’S POST HOC TEST ORDERED ADUSTED FINAL MEAN DIFFERENCE OF RESTING PULSERATE**

Mean Value			Mean difference	CI	L.S
Control Group	Experimental Group I	Experimental Group II			
73.363	71.101		2.262	1.50	
	71.101	69.735	1.366	1.50	
73.363		69.735	3.628	1.50	

The analysis of co-variance of resting pulse rate indicated that experimental groups I (Intensive training) were insignificant and Experimental group II (extensive training) were significantly improved the resting pulse rate.

**BAR DIAGRAM : PULSE RATE**



**TABLE – VI : COMPUTATION OF ANALYSIS OF CO-VARIANCE OF BREATH HOLDING TIME**

Group	Control group	Experimental group I	Experimental Group II	SV	SS	df	Mean of square	Obtained f - ratio
Pre test	44.1	45.2	44.5	B	66.2	2	3.1	0.73*
				W	71.15	27	4.26	
Post test	45.4	51.2	47.8	B	169.87	2	84.94	24.48*
				W	93.6	27	0.57	
Adjusted post test	43.65	47.3	44.1	B	87.04	2	43.52	11.02*
				W	102.6	26	3.95	

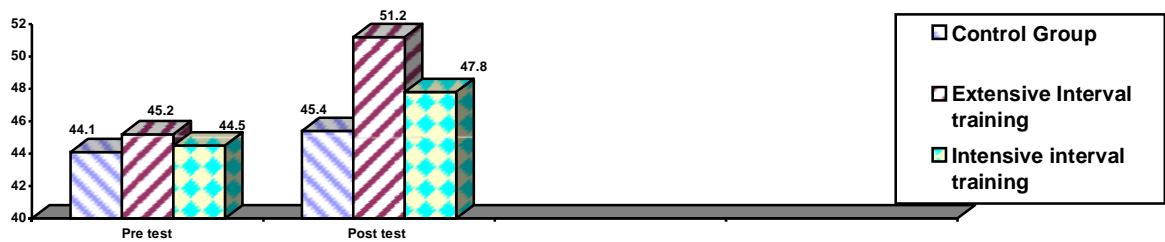
- Significant

**TABLE VI a :COMPUTATION OF SCHEFF’S POST HOC TEST ORDERED ADUSTED FINAL MEAN DIFFERENCE OF BREATH HOLDING TIME**

Mean Value			Mean difference	CI	L.S
Control Group	Experimental Group I	Experimental Group II			
47.3	44.17		3.13	2.31	
47.3		43.65	3.65	2.31	
	44.17	43.65	0.52	2.31	*

The findings of two training method intensive interval training and Extensive interval training showed that there was significant improvement in breath holding capacity. Both training methods improve the lung capacity. Hence the comparison showed the significant difference in breath holding time.

**BAR DIAGRAM : BREATH HOLDING TIME**



In this research the first hypothesis stated that the motor ability may not be better in Intensive interval training than the Extensive interval training.

#### **DISCUSSIONS:**

The findings of the study showed that there were significant effect due to influence of intensive interval training on motor ability components are better than the Extensive interval training on motor ability components. Hence the first hypothesis was accepted on the above said variable.

In this research the second hypothesis stated that the physiological variables (pulse rate, Breath holding time) may not be better in Intensive interval training than the Extensive interval training.

The findings of the study showed that there were significant effects due to the influence of Intensive interval training on physiological variables are better than the Extensive interval training on physiological variable. The intensive and extensive interval training made significant improvement in speed, explosive power physiological variable pulse rate, and breathe holding time. The training also made significant improvement in motor ability components and physiological variables.

#### **CONCLUSION:**

The following conclusions were drawn: Intensive and Extensive interval training equally improved for the following factors of motor ability components namely speed, explosive power. The six weeks of Intensive and extensive interval training might be significant improvement in speed, and explosive power, among the college women students.

Intensive and extensive interval training equally improve for the following factors of physiological variables. The six weeks of intensive and extensive interval training might be significant improvement of physiological variable resting pulse rate breath holding time among college women student.

**Reference:**

- [1] J. Borresen, M.I. Lambert, Autonomic control of heart rate during and after exercise measurements and implications for monitoring training status, *Sports Medicine* 38 (2008) 633-646.
- [2] Charles A.Bucher and Willam E.Perntice, *Fitness for College and life*, (Saint Louis lousi Toronto Saturn clara time mirror Mosby College publishing 1985) p-26
- [3] Dietrich Harre and Team of workers, *Principle of Sports Training*, (Sports Vollagberlin 1982) p.10.
- [4] Joseph James, *A comparative study of the effect of training and break in training on Sprinting speed*, Master Thesis, Jiwaji University, Gwalior,1999) P-15.