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## Effect of combination of speed and endurance training programme on selected physical and physiological variables of women handball players

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### Abstract

The purpose of the study was to find out the effect of combination of speed and endurance training on selected physical and physiological variables of university women handball players. To achieve this purpose, thirty women handball players studying in Annamalai University, Tamilnadu were randomly selected as subjects. They were divided into two equal groups and each group consisted of 15 subjects. Group-I underwent combination of speed and endurance training (n = 15) for three days per week for eight weeks and group-II acted as control (n = 15) who did not participate any special training apart from the regular curricular activities. The selected dependent variables speed, strength endurance, cardio-respiratory endurance and resting pulse rate were assessed by administering 50 meters run, sit-ups, Cooper's 9 minutes run and walk and rate of pulse per minute respectively. The data were collected at prior and immediately after the training programme were statistically examined for significant differences, if any, by applying analysis of covariance (ANCOVA). In all the cases, .05 level of confidence was used to test the significance, which was considered as an appropriate.

**Keywords:** Speed and endurance training, physical and physiological variables.

### 1. Introduction

One of the most beautiful and valuable things that God has created on earth is human life. It is the responsibility of human to protect and maintain human life in order to achieve higher goals and live a meaningful life. This can be made possible by paying due attention to health and fitness. So scientist's researchers and health experts have devoted much of their precious time to the field of health and fitness. The greatness of a nation is dependent to a large extent on the fitness of its citizens. "Total fitness" includes physical, mental, emotional, social and spiritual aspects. Physical educators are mainly responsible for promoting the physical aspect of total fitness in harmony with all the other aspects of fitness.

### 2. Methodology

#### 2.1 Selection of subjects

The purpose of the study was to find out the effect of combination of speed and endurance training on selected physical and physiological variables of university women handball players. To achieve this purpose, thirty women handball players studying in Annamalai University, Tamilnadu were randomly selected as subjects. The age groups of the subjects were ranged between 18 to 25 years. They were divided into two equal groups and each group consisted of 15 subjects. Group-I underwent combination of speed and endurance training for three days per week for eight weeks and group-II acted as control who did not participate any special training apart from the regular curricular activities.

#### 2.2 Selection of variables and tests

The present study was undertaken to assess the effect of combination of speed and endurance training on selected physical and physiological variables of university women handball players. The investigator analyzed various literatures and also consulted with physical education professionals, to use the most suitable tests for the purpose of study and it was presented in table - 1.

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**Table 1:** Dependent Variables and their Respective Tests

Sl. No.	Criterion Variables	Test Items	Unit of Measurement
1.	Speed	50 Meters Run	Seconds
2.	Strength Endurance	Sit-ups	Numbers
3.	Cardio-respiratory Endurance	Cooper’s 9 minutes Run and Walk	Meters
4.	Resting Pulse Rate	Pulse rate per minute	Numbers

**2.3 Specific Speed and Endurance Training**

The experimental group underwent combination of speed and endurance training for three days per week for eight weeks.

1. Fartlek runs-mix of sprint & jogs:
  - I. Sprint straight away, jog turns on track Sprint turns, jog straight away on track, and Sprint from tree to tree, mailbox to mailbox, telephone pole to pole, with jogs in between.
  - II. Start 8-10 minutes; add 2 minutes every 2 weeks.
2. Fartlek run-mix of sprints & jogs:
  - I. Get certain of sprint of varying distances during each mile run.
  - II. 2-3 mile run 3, 4, 6, or 10 sprints of varying distances during each mile run. (3 sprint/ mile).
3. Linear Speed running – 100 yards.
4. 10 x 30 metres at race pace from blocks with full recovery 4 x 80 metres at race pace with full recovery.
5. 18- 27 minutes walking.
6. 27- 36 minutes jogging.

7. 13- 23 minutes running.
8. 9- 13 minutes sprinting.

**2.4 Experimental design and statistical procedure**

The random group design was used as experimental design. The selected subjects were tested on selected criterion variables at prior to and immediately after the training programme and were statistically examined for significant differences, if any, by applying analysis of covariance (ANCOVA). In all the cases, .05 level of confidence was used to test the significance, which was considered as an appropriate.

**3. Results**

The data collected during pre and post-tests among control and training groups have been analysed statistically and the details are shown in table- 2.

**Table 2:** Analysis of Covariance for the Adjusted Posttest Data on Selected Speed, strength endurance, cardiorespiratory endurance and resting pulse rate of Control and Training Groups

Variables	Control group	Training group	Source of ariance	Sum of squares	df	Mean Squares	F Ratio
Speed	6.28	7.51	B: W:	9.65 2.27	1 27	9.65 0.08	120.62
Strength endurance	38.86	40.46	B: W:	531.25 68.62	1 27	537.25 2.52	210.81
Cardiorespiratory endurance	1792.93	1873.79	B: W:	48805.81 39037.44	1 27	48805.81 1445.83	33.76
Resting pulse rate	70.72	68.68	B: W:	30.89 15.17	1 27	30.89 0.56	55.16

The tabulated F ratio for 0.05 level df 1 & 27= 4.21

The adjusted post-test mean values of speed for combination of speed and endurance training group and control group were 7.51 and 6.28 respectively. The obtained ‘F’ ratio value of 120.62 for adjusted post-test scores of combination of speed and endurance training group and control group were greater than the required table value of 4.21 for significance with df 1 and 27 at .05 level of confidence. The results of this study showed that there was a significant difference between combination of speed and endurance training group and control group on speed.

The adjusted post-test mean values of strength endurance for combination of speed and endurance training group and control group were 40.46 and 38.86 respectively. The obtained ‘F’ ratio value of 210.81 for adjusted post-test scores of combination of speed and endurance training group and control group were greater than the required table value of 4.21 for significance with df 1 and 27 at .05 level of confidence. The results of this study showed that there was a significant difference between combination of speed and endurance training group and control group on strength endurance.

The adjusted post-test mean values of cardio-respiratory endurance for combination of speed and endurance training group and control group were 1873.79 and 1792.93 respectively. The obtained ‘F’ ratio value of 33.76 for adjusted

post-test scores of combination of speed and endurance training group and control group were greater than the required table value of 4.21 for significance with df 1 and 27 at .05 level of confidence. The results of this study showed that there was a significant difference between combination of speed and endurance training group and control group on cardio-respiratory endurance.

The adjusted post-test mean values of resting pulse rate for combination of speed and endurance training group and control group were 68.68 and 70.72 respectively. The obtained ‘F’ ratio value of 55.16 for adjusted post-test scores of combination of speed and endurance training group and control group were greater than the required table value of 4.21 for significance with df 1 and 27 at .05 level of confidence. The results of this study showed that there was a significant difference between combination of speed and endurance training group and control group on resting pulse rate.

**4. Discussion**

According to **Gerschler** the number of repetitions of exercise should be increased with the person’s adaptation to the training and that increase on the distance of the race, the speed attained and time taken to recuperate. **Leskevith and et al**

indicated that the effect of the sequence of exercises that observed changes was noted in speed, strength and endurance. **Roshamm** concluded that continuous is most effective in decreasing heart rates at rest. These findings are also in agreement with the finding of **Gentry and Roy** indicated that the endurance training significant decrease in resting pulse rate. **Uppal** in the study found that by endurance training the efficiency of the circulatory and respiratory systems improved, maximal oxygen up take is increased. Stroke volume and cardiac output increased, ventilator improved, lung volumes became larger and diffusion capacities increased than that of control group. This result that the continuous running group improves the cardio respiratory endurance, breath holding time and lowering of respiratory rate.

The new model of the handball player is one who is a highly conditioned athlete, possessing refined athletic skills, which ultimately elevate the level at which he or she plays the game. Conditioning is the key to consistency in season long, high level performance. Speed and endurance are the athletic skills often considered most valuable for handball.

### 5. Conclusions

The results of the study showed that there was a significant improvement on selected criterion variables such as speed, strength endurance, cardio-respiratory endurance and resting pulse rate due to combination of speed and endurance training. In the present study, the specifically designed combination of speed and endurance training for university women handball players is highly relevant to the selected criterion variables. So that the specific combination of speed and endurance training may influence the criterion variables.

### 6. Reference

1. Arnheim, Daniel D. *Modern Principles of Athletic Training*, St. Louis: The Mosby College Publishing Company, 1985.
2. Bompa, Tudor O. *Theory and Methodology of Training: The Key to Athlete Performance*, Iowa: Kendar Publishing Company, 1983.
3. Clarke, David H, Harrison H. Clarke. *Application of Measurement Health and Physical Education*, Englewood Cliffs, New Jersey: Prentice Hall Inc., 1989.
4. Connolly, Christopher Hetty Einzing. *The Fitness Jungle*, London: Century Hutchinson Limited, 1986.
5. Fox, Edward L, Donald K. Mathews. *The Physiological Basis of Physical Education and Athletics*, Philadelphia: W.B. Saunders Company, 1971.
6. Harold M. Barrow, Rosemary McGee, Kathleen A. Tritschler. *Practical measurement in Physical Education and Sport*. 4th Edition. Lee & Febiger of Philadelphia. U.S.A, 10.
7. Harrison H. Clarke. *Application of measurement to Health and Physical Education* Englewood Cliffs. Prentice-Hall Incorporation. New Jersey. U.S.A, 12.
8. Johnson, SM, Stolberry PC. *Sports Experiences and You*, New York: McGraw Hill Book Company, 1961.
9. Miller, Donna Mae. *Coaching the Female Athletes*, Philadelphia: Lea and Febiger, 1974.
10. Moran, Gray T, George H. Meglyn. *Cross Training for Sports Programme for 26 Sports*, London: Wesley Publishing Co., Ltd., 1988.
11. Neal, Pasty. *Coaching Method of Women*, Massachusetts: Addison Wesley Publishing Company, 1969.
12. Scholich, Kreistraining M. *Circuit Training*, Berlin: Spotverlag, 1979.

13. Strukic PJ. *Basic Physiology*, New York: Spring Envellong Inc., 1981.
14. Thani, Lokesh. *How to Play Handball*, (Delhi: Sports Publication, 2000.
15. Yobu A. *The Measurement and Evaluation*, (1<sup>st</sup> ed.), Madras: Rajmohan Pathipakam, 1988.