AN ABSTRACT

An Analytical Study of Isotonic and Isokinetic Endurance Training on Cardiovascular and Pulmonary Functions.

The purpose of the study was to determine the effect of Isotonic and Isokinetic Endurance Training on Cardiovascular and Pulmonary Functions. The subjects for this study were fifteen male cricketers of L.N.I.P.E. cricket academy (Gwalior). The age of the subjects ranged between 15-18 years. The subjects were equally divided into three groups namely two experimental and one control group. All experimental groups were equated based on their pre-test performance on all the selected cardiovascular and pulmonary functions.

Based on literary evidence and scholar's own understanding the following variables were selected for the purpose of this study: Cardiovascular variables namely; Heart Rate, Blood Pressure (Systolic and Diastolic) and Endurance. Pulmonary variables namely; Vital Capacity, Peak Flow Rate, Respiratory Rate, Forced Vital Capacity, VO₂ max, Forced Expiratory Volume₁, Maximum Voluntary Ventilation, Breath Holding Capacity (Positive and Negative) and Minute Ventilation. The tests used in this Study for the collection of data were found to be most reliable and have been used very often in the profession of physical education and sports all over the world.

Heart rate was measured in terms of number of pulse beats per minute. Blood pressure was measured by sphygmomanometer in mm Hg. Cardiorespiratory endurance was analyzed by the 12 min. cooper test and recorded distance in meters covered in 12 minutes. Vital capacity, Forced Vital Capacity, Maximum Voluntary Ventilation and Forced Expiratory Volume₁ were measured by Spirometry test and data was recorded in litres. Three trials were given and the best one was recorded as the score in spirometry test. Positive breath holding & Negative breath holding was measured by manual method and the score was recorded in seconds. VO₂max refers to the highest rate at which oxygen can be taken up and consumed by the body during intense exercise and recorded in liters. A measure of the rate of ventilation, referring to the total exchange of air between the lungs and the ambient air and recorded in liters.
The experimental groups were imparted 30-40 minutes of (three times in a week) training of isotonic and isokinetic respectively for ten weeks under the proper supervision and guidance of the scholar while no training was imparted to control group. Before starting the training programme pre-test and at the end of ten weeks post test was conducted for all the groups.

In order to study the effect of isotonic and isokinetic on selected cardiovascular and pulmonary variables, Analysis of Co-variance was employed.

Within the limitations of the present study, the following conclusions may be drawn:

- Isotonic and isokinetic group brings significant changes for improving heart rate.
- Isotonic group brings significant changes for improving systolic blood pressure.
- There was no significant effect was found through training for improving diastolic blood pressure between isotonic group, isokinetic group and control group.
- Isotonic group brings significant changes for improving endurance of the subjects.
- Isotonic and isokinetic group brings significant changes for improving vital capacity.
- Isotonic and isokinetic group brings significant changes for improving peak expiratory flow rate.
- Isotonic and isokinetic group brings significant changes for improving respiratory rate.
- Isotonic and isokinetic group brings significant changes for improving forced vital capacity.
- Isotonic and isokinetic group brings significant changes for improving VO\textsubscript{2} max.
- Isotonic group brings significant changes for improving forced expiratory volume1.
- Isotonic and isokinetic group brings significant changes for improving maximum voluntary ventilation.
➢ Isotonic group brings significant changes for improving positive breath holding.
➢ Isotonic group brings significant changes for improving negative breath holding.
➢ There was no significant effect was found through training for improving minute ventilation between isotonic group, isokinetic group and control group.