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Effects of both leg foot jump skipping and staircase step aerobics on vo₂ max on college and university females

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Abstract

The purpose of this study was determined "Effects of Both Leg Foot Jump Skipping and Staircase Step Aerobics on Vo₂max on College and University Females". To achieve the purpose of these study ninety (90) subjects randomly selected from West Bengal different college and Visva-Bharati University of females. The subject's age groups were ranged between 18 to 22 years only. All the subjects were randomly assigned to two experimental groups (X, Y) and the one control group (Z) each group consisting of thirty (30) subjects. Vo₂max was measured at the beginning and after the experimental period of ten weeks in terms of per-test and post-test scores on the criterion measures. To measure the vo₂max Cooper test was used. The analysis of co-variance was used as the statistical treatment with the level of confidence at 0.05. It was found that mean difference of Both leg foot jump skipping and Staircase step aerobics: Both leg foot jump skipping and Control group: Staircase step aerobics and control group were found to be significant. The mean change made by the two experimental group showed statistically significant difference between them. However the mean change made by the both leg foot jump skipping and Staircase step aerobics group were significantly greater than control group in the vo₂ max.

Keywords: Both leg foot jump skipping, Staircase step, aerobics, Vo₂ max

Introduction

We are creatures of the space age. Our hands are like machines and our brain is like computer. We breathe in facts and breathe out theories and principles that run our life's business. Body is a prized possession of man, a gift of nature. It is very basis of man's existence and the plinth of personality. In the modern scientific age, every field of human endeavor, systematic, objective and scientific procedure is followed in harmony with principles based on experience, understanding and application of the knowledge of science. The field of games and sports is no exception on this. In progressive countries like U.S.A, Germany, Russia, Australia etc. speedy progress in the field of games and sports has taken place their international achievements have been possible due to research experimentation and application of scientific knowledge in the field of games and sports. Today it is essential for the physical education and the coaches recognize the vital part, science plays an important role in the successful conduct of physical education and athletic programme, to contribute to the best of one's ability to all features of physical education and athletics will require a good understanding of the available scientific knowledge not only will such understanding results in better teams and better programme of activities but also enable to guard the health of pupils. Then too meaningful the reason why to select a particular training programme for accomplishing a specific task scientific knowledge is essential. In today's techno – scientific age, the world has completely changed in all aspects due to discovery and research. In the field of games and sports also, there has been a great changed with the help of scientific coaching and training. The athlete are being trained on scientific guidelines with highly sophisticated means for better achievement in their concerned sport to enable the coaches to get optimum performance with minimum expenditure of energy and time. They are being exposed to the exercise and training methods, which have got beneficial effect for achieving higher standard. The main aspect to be emphasized in order to achieve high level of performance is the efficient function of the body.

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They must function well enough to support the particular activity that the individual is performing since different activities make different demands upon the organism with respect to blood circulation, respiration, metabolic neurological and temperature regulating functions, physiological fitness is specific to activity $\text{vo}_2 \text{ max}$ is the maximum volume of oxygen that by the body can consume during intense, whole body exercise, while breathing air at sea level. This volume is expressed as a rate, either liters per minute (L/Min) or milliliters per kg bodyweight per minute (ml/kg/min). Because oxygen consumption is linearly related to energy expenditure. $\text{Vo}_2 \text{ max}$ is an essential part of physical education and sports field. Maximum oxygen uptake depends on some factors like gender, genetics, age, size, altitude and temperature. But training can increase the % $\text{vo}_2 \text{ max}$ by 20 to 30 percent. In this study researcher intended to the effectiveness of both leg foot jump skipping and staircase step aerobics programme on $\text{vo}_2 \text{ max}$ of female of selected age range. This can be useful in the place where the climatic condition, inadequate space and other facilities do not allow the trainees to adopt other type of training programmes.

Methodology

Ninety (90) females of West Bengal different college and Visva-Bharati University Department of Physical Education were selected as subjects. These girls age ranged from 18 to 22 years. The age of the above selected girls was verified from their respective age records in the Institutes. All the subjects were randomly assigned to two experimental groups (X, Y) and the one control group (Z) each consisting of thirty subjects. The experimental treatments were also assigned to

the group at random. The X, Y was treated as experimental groups and was administered progressive training programme of Both Leg Foot Jump Skipping and Staircase Step Aerobics respectively for ten weeks. The group 'Z' was served as control group and continue attending the college and university but did not participate in any kind of training programme. $\text{Vo}_2 \text{ max}$ was assessed at the beginning and after the experimental period of ten weeks in terms of pre-test and post-test scores on the criterion measure. The necessary data was collected with standardized procedure by administering Cooper Test. The necessary work was done before the start of the test. All the tests were administered and explained to the subjects categorically and left no ambiguity. Any doubts of the subjects raised were clarified before taking the test, but no special training was given to the subjects. The girls were assembled on the track for the Cooper test. Every subject was given instruction for done cooper test. Eight physical education student were helped the researcher as official. At first 400 mt track was divided by eight ($400/8 = 50$). One official was including of every 50 meter. First official was start 12 minute run by whistle with began stopwatch. After finished 12 minute the subject stop running with whistle of an official. Every subject was standing his nearby official and official record the subjects distance which he/she covered within 12 minutes. For this test the subjects were talking to run as far as possible within 12 minutes. The formula used to calculate $\text{vo}_2 \text{ max}$ was $-(12 \text{ Distance} - 504.9) / 44.73$. To find out the analysis of co-variance was used as the statistical treatment with the level of confidence at 0.05.

Results

Table I: Analysis of covariance of the mean of two experimental groups and control group in VO 2 max.

Group				Sum of square	df	Mean square	F-ratio
	Both leg foot jump skipping (X)	Staircase step aerobics (Y)	Control group (Z)				
Pre-test mean	42.24	40.87	41.06	A32.68 W2166.6	2 87	16.35 24.92	0.657
Post-test mean	47.2	44.3	41.23	A534.29 W2020.74	2 87	267.15 23.24	11.50*
Adjusted post-test mean	46.47	44.78	41.23	A378.54 W390.42	2 86	189.27 4.57	41.58*

Analysis of covariance of the mean of two experimental groups and control in $\text{vo}_2 \text{ max}$. Significant at 0.05 level of confidence, N=90, A= among mean variance, W=within group variance, F-ratio need for significance at 0.05 level of confidence = 3.11

The critical difference for adjusted post- test means was applied to find out which of the difference between the paired adjusted final were statistically significant. Difference between the paired adjusted final means is shown in table –II.

Table II: Paired adjusted means and difference between means for two experimental groups and the control group in $\text{VO}_2 \text{ max}$.

Means			Difference between means	Critical difference for Adjusted mean
Both leg foot jump skipping	Staircase step test	Control group		
46.47	44.78		1.69*	0.86
46.47		41.23	5.24*	0.86
	44.78	41.23	3.55*	0.86

It is apparent from table – II that the mean difference of both leg foot jump skipping and Staircase step test –aerobics: Both leg foot jump skipping and Control group: Staircase step test and Control group were found to be significant at 0.05 level. The mean change made by the two experimental group showed statistically significant difference between them. However the mean change made by the both leg foot jump skipping and Staircase step test aerobic group were

significantly greater than the control group in the $\text{vo}_2 \text{ max}$.

Discussion

The analysis of data using analysis covariance revealed that two experimental groups trained by both leg foot jump skipping and staircase step exercise, showed significant changes in the $\text{vo}_2 \text{ max}$. Both leg foot jump skipping had showed higher physiological change in concerned with

vo_2max followed by staircase step aerobics. There was no change found in control group because the control group was not edged in any type of systematic physical activity as the other two experimental groups were. And ten week was not enough duration to bring any physiological changes as per the growth and growth and development was concerned.

The better performance of experimental group as compared to the control group may be due to the fact that the experimental groups have undergone a systematic and progressive training programme (thrice a week) for duration of ten weeks whereas control group did not participated in any kind of formal training. It is an established fact that regular training of optimum intensity brings some specific physiological adaptive change in various parameters namely cardiovascular system, muscular system and body composition. The both leg foot jump skipping group showed better adaptation in their vo_2max , than that of staircase step aerobics and control group. The effect of both leg foot jump inducted higher physiological changes probably its movement was more recreational and may be due to fact that skipping obviously involves almost the entire parts of body to that of staircase aerobic. The both leg foot jump skipping group also achieved better development because both leg foot jump skipping group also achieved better development because both leg foot jump skipping types of exercise were motivating to the subject and they were very familiar with this type of activity also.

Conclusion

Ten weeks of participation of different modes staircase step aerobics and both leg foot jump skipping of training produced higher vo_2max of experimental subject. Ten week of participation in different modes of training namely both leg foot jump skipping and staircase step aerobics were effective in bringing change in vo_2max . Between two modes of training both leg foot jump skipping exercise followed by staircase step aerobics achieved the highest development in vo_2max .

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