



Effect of Aerobic Exercise and Yogic Practices on Muscular Endurance and Flexibility

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Abstract

The purpose of the study was to find out the impact of aerobic exercise and yogic practices on muscular endurance and flexibility. Forty five male students aged between 17 and 21 years were selected for the study. They were divided into three equal groups, each group consisting of fifteen subjects in which two experimental groups and one control group, in which the group I (n=15) underwent aerobic exercise, group II (n = 15) underwent yogic practices for three days (alternative days) per week for twelve weeks, and group III (n=15) acted as control, which did not participate in any training. The experimental group – I (continuous running) & experimental group - II (yoga practice) who participated were informed to report at the early hours of the day around 5.30 A.M. at their training places. The subjects tested on selected criterion variables such as muscular endurance and flexibility at prior to and immediately after the training period. For testing the muscular endurance, push-up test was used and to measure the flexibility, Taylor's Manifest Flexibility Scale was used. The analysis of covariance (ANCOVA) was used to find out the significant difference if any, between the experimental groups and control group on selected criterion variables separately. Since there were three groups involved in the present study, the Scheffé S test was used as post-hoc test. The selected criterion variables such as muscular endurance were improved and flexibility was significantly decreased for the training groups when compared with the control group. Moreover, there were no significant difference was occurred between the training groups on selected criterion variables.

Keywords: Aerobic exercise, yogic practices, muscular endurance and flexibility.

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Introduction

The human being's fitness is primarily based on the utmost stage of successful and metabolic effectiveness. It is standard situation of a human being in body, thinking and spirit, to be free from stress or stain or sick, which skill 'good health' or healthy'. The WHO (World Health Organization) defined that the human's fitness is the asset of total mental, bodily and well-being and no longer straight away relieving from illness or disease. In addition, this that means has been situation to debate, in particular as having a lack of operational fee and the challenge created by using use of the phrase 'complete', it remnants the utmost durable. The Family of International Classifications, World Health Organization, as properly as the International Classification of Functioning (ICF) and the International Classification of Diseases (ISD), are defined and decided the mechanism of health.

High-complicated bodily endeavor is a kind of exercise which improves the productiveness of the cardiovascular shape in absorbing and transporting

oxygen. The magnitude of cardio endeavor is accompanying with the presence of oxygen. It in a similar way alludes that this variety of pastime is to make use of oxygen as a section of the human body's metabolic or energy producing methodology. There are such a vary of assortments of high-impact exercise, through meaning, are carried out at average ranges of energy for produced instances of time. Aerobic is something however nothing that relates or includes or requires free oxygen[1] and in addition capability the utilization of oxygen that is sufficiently requisite to accumulate electricity insistence whilst performing bodily jerk by means of cardio metabolism.[2]

Run of the mill forceful activities that exploit large muscle groups are separately on bicycling, cross-country, swimming, running and strolling, and skiing. These performances, even though exhausting, are rhythmical and are performed and not as much as full level of power. Among strenuous activity, there is minimum rest period for the principle of performing muscle jamboree (among alternate muscle gathering and performing the work). Aerobic is a time period which involves, relates to or requiring the oxygen[3] and additionally linked to make use of oxygen sufficiently with needs of power throughout workout overall performance with cardio metabolism.[4] It's time-

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honored that minimal to modest effective things to do which is bolstered by using cardio metabolism will be labored for a most intervals of time.[5]

Involving anaerobic and cardio activity, improves the potential of the coronary heart mechanism with the aid of growing the thickness myocardial muscle (resistance training) or cardiac output (aerobic exercise). Not all human beings get advantages equally performing the bodily exercise. There is notable distinction in individual's response to bodily activity: the place all most of humans are witnessed some average enchantment in persistence by way of performing cardio exercise, some peoples will as many as double their oxygen intake, whilst different humans will ever get any gain at all from the bodily activity. Similarly, solely minimal humans will exhibit top notch muscle improvement after prolonged duration of weight training, whilst a most fraction of humans ride improvement in strength. The asana (also recognised as postures of yoga) help to stretch and loosen up the muscular tissues and human physique skeletal system. The launch thru bodily potential with soothing actions can assist to make a experience of well-being and calmness. Physical pastime or exercising of any type will help humans with excessive stages of anxiety, and asana have the extra advantages of especially growing deep muscle rest whilst harmonizing at the equal time.[6]

It is 5 important mechanisms of the physique and thinking multiplex in yoga, in which the one is the pranamaya kosha or the cowl of prana. The 5 koshas are: a) annamaya kosha or the gadget of digestion, b) pranamaya kosha or the oxygen which gives the world of dwelling in nano or cellular, which is nearly the complete body, c) vignanamaya kosha or the goal and mathematical, in which the left talent have to desires and have a extra crucial position to play in all choice making, d) manonmaya kosha or the interesting proper Genius and e) anandamaya kosha or the world of heavenly bliss. This Kosha is additionally constant in the human body.[7] Fitness is the individual's potential to feature and stay efficiently, decisively and jest fully. Now and right here to meet self-confidently the troubles and calamity which are amongst life's expectations.[8]

Bucher and Prentice[9] referred to that, health is a broad time period denoting vivid traits that allow an individual's needs regarding intellectual and emotional stability, social recognition and adoptability and sacred and ethical fiber and natural fitness steady with ones' heredity. Physical health is a function of universal fitness. The idiom bodily health has been awesome in a number ways. Physical health is a most important obligatory in order to attain the utmost in existence and to stay greater or much less and supply most in this cutting-edge world. A sound physique and a sound thought are male or female's most valuable

belongings.[10]

Flexibility is now not a frequent element however is exceedingly unique to every joint. Even the two joints of a bilateral aircraft in the equal character can also range noticeably. An indication of experimental data helps the conclusions that flexibility correlates with traditional motion patterns for every individual and every joint, and that age and intercourse disparity are secondary as an alternative than inmate. The well-known flexibility decreases slowly from beginning to historical age. Women and girls have greater flexibility than men at the comparable age category.

Materials and Methods

In this study it was aimed to find out the effect of aerobic exercise and yogic practices on muscular endurance and flexibility. To achieve the purpose forty five male football players from various colleges of Thiruvalluvar University, Vellore, were selected as subjects at random from the total population of 86 students. They were divided into three equal groups of fifteen each and further divided as two experimental groups and one control group, in which the group I (n=15) underwent aerobic exercise weekly three days (alternative days – Monday, Wednesday and Friday), group II (n = 15) underwent yogic practices for six days (Monday to Saturday) per week for twelve weeks, and group III (n=15) acted as control which did not participate in any special training apart from the regular curricular activities. To evaluate the initial load for endurance training group, the Cooper's 12 minutes run/walk test was conducted. The minimum distance covered by the subject was fixed as initial load. The experimental group – I (continuous running) & experimental group - II (yoga practice) who participated were informed to report at the early hours of the day around 5.30 A.M. at their training places. For every training programme there would be a change in various structure and systems in human body. So, the researchers consulted with the experts and then selected the following variables as criterion variables: 1. Muscular endurance, 2. Flexibility.

Data Analysis

Analysis of covariance was used to determine the differences, if any, among the adjusted post test means on selected criterion variables separately. Whenever the 'F' ratio for adjusted post test mean was found to be significant, the Scheffé S test was applied as post-hoc test. The level of significance was fixed at .05 level of confidence to test the 'F' ratio obtained by analysis of covariance.

Table 1

Analysis of Covariance and 'F' ratio for Muscular and Flexibility endurance of Aerobic Exercise Group, Yogic Practices Group and Control Group

Variable Name	Group Name	Aerobic exercise Group	Yogic Practices Group	Control Group	'F' Ratio
Muscular endurance (in Nos./Min.)	Pre-test Mean \pm S.D.	35.73 \pm 1.16	35.40 \pm 1.242	36.13 \pm 1.36	1.28
	Post-test Mean \pm S.D.	38.33 \pm 1.11	38.80 \pm 0.94	35.53 \pm 1.45	33.07*
	Adj. Post-test Mean	38.349	39.055	35.263	93.05*
Flexibility (in Inches)	Pre-test Mean \pm S.D.	7.80 \pm 0.86	7.73 \pm 0.70	7.80 \pm 0.76	0.038
	Post-test Mean \pm S.D.	10.07 \pm 0.96	10.27 \pm 0.88	7.60 \pm 0.74	44.17*
	Adj. Post-test Mean	10.59	10.282	7.592	48.45*

* Significant at .05 level of confidence. (The table value required for significance at .05 level of confidence with df 2 and 42 and 2 and 41 were 3.22 and 3.23 respectively).

Table 1 shows that pre test means 'f' ratio of aerobic exercise group, yogic practices group and control group on muscular endurance was 1.28, which is insignificant at 0.05 level of confidence. The post and adjusted post test mean 'f' ratio value of experimental groups and control group was 33.07 and 93.05, which was significant at 0.05 level of confidence. The pre and post test means 'f' ratio of aerobic exercise group, yogic practices group and control group on flexibility was

0.038, which is insignificant at 0.05 level of confidence. The post and adjusted post test mean 'f' ratio value of experimental groups and control group was 44.17 and 48.45 which was significant at 0.05 level of confidence. The overall study shows that there was a significant decrease in flexibility and muscular endurance. Further, to find out which of the paired mean significantly differ, the Scheffé S test was applied and presented below.

Table 2

Scheffé S Test for the Difference Between the Adjusted Post-Test Mean of Muscular endurance and Flexibility

Aerobic exercise Group	Yogic Practices Group	Control Group	Mean Difference	Confidence Interval at 0.05 level
Adjusted Post-test Mean Difference on Muscular Endurance				
38.349		35.263	3.086*	0.75
38.349	39.055		0.706	0.75
	39.055	35.263	3.792*	0.75
Adjusted Post-test Mean Difference on Flexibility				
10.059		7.592	2.467*	0.77
10.059	10.282		0.223	0.77
	10.282	7.592	2.69*	0.77

* Significant at 0.05 level of confidence.

Table 2 shows that the Scheffé S Test on muscular endurance for the difference between adjusted post-test mean of aerobic exercise group and control group (3.086) and yogic practices group and control group (3.792) which were significant at 0.05 level of confidence. But there was no significant difference between aerobic exercise group and yogic practices group (0.706) on muscular endurance after the respective training programme. Table 2 shows that the Scheffé S Test for the difference between adjusted post-test mean difference in flexibility between aerobic exercise group and control group (2.467), and yogic practices group and

control group (2.69) were significant at 0.05 level of confidence in favour of yogic practices group. But there was no significant difference between aerobic exercise group and yogic practices group (0.223) on flexibility after the respective training programme.

Conclusions

1. The aerobic exercise and circuit training groups has shows their improvement in muscular endurance than the control group. Arazi and Faraji [11] has found that muscular endurance was improved after the endurance training.

Tran *et al* [12] has found that there was a significant improvement in muscular endurance after the yoga practice.

2. Flexibility was also significantly improved for all the training groups, such as, resistance training group and yogic practices group when compared with the control group. Milanovic *et al* [13] also found that the moderate soccer training and continuous running was improved the flexibility. Jay Polsgrove *et al* [14] found that the yoga practice has improved the flexibility among college athletes.

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