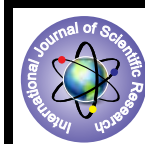


Cardiovascular Adaptation and Body Composition Changes of College Males Under the Influence of Exercise Training



Physical Education

KEYWORDS : Cardiovascular, Adaptations, Exercise

Sri Abhijit Thander	Assistant Director, Physical Education, Visva-Bharati Sports Board, Visva-Bharati University, Santiniketan W.B, India, 731235
Dr. Sagarika Bondyopadhyay	Associate Professor, Department of Physical Education, Visva-Bharati University, Santiniketan W.B, India, 731235
Sri Sujoy Birbanshi	Assistant Professor, Physical Education, Vivekananda Satabarshiki Mahavidyalaya , Manik Para Paschim Medinipur, West Bengal 721513

ABSTRACT

To assess the influence of eight week exercise training on cardiovascular adaptations and body composition, sixty non-athlete male college students were divided into two groups-experimental and control with 30 subjects each group. The training programme lasted for a period of 8 weeks, with sixty-minute training sessions three times a week. VO₂ max was measured by bleep test, blood pressure and heart rate was measured by calibrated omeron's digital monitor; body composition was estimated by computing the body mass index (BMI). Descriptive statistics and t-test was computed to compare groups. The results showed that after 8 weeks training significant differences among the mean of cardiovascular parameters and body composition of the two groups were observed. The findings indicate that an exercise training programme of 8 weeks, three days in a week with 60 min duration is sufficient to improve cardiovascular fitness and body composition in collage aged male.

INTRODUCTION

Sedentary lifestyle, overweight and obesity are major health, clinical, and economical problems in modern societies. The worldwide epidemic of excess body mass is due to imbalance between physical activity and dietary energy intake. The World Health Organization (2002) reports that about 60% of the global population does not do the daily minimum recommendation of 30 min of moderate intensity physical activity for a healthy life style.

Certain fitness investigations have been carried out on subjects from the younger (Armstrong and Welsman 2002, Guerra et al., 2002) to check the effects of concrete exercise modes. Based on studies it is gathered that change in body composition is related more to frequency than to intensity of exercise (Bassulk, 2003 and Chambliss, 2003). Scientific literature indicates that at least 60 minutes of moderate-intensity of

Physical activity may be necessary to maximize weight loss and prevent significant weight regain (Jakicic, 2003; Kemper et al, 2003; Hill &Wyatt, 2005).

There are many youths who are not in sports but would like to have finely built bodies, especially collage aged students. For some of them, it is the only motivation for their exercise. Many collage aged students can not be trained at high intensity level and prefer moderate level of physical activity. Besides, in a busy lifestyle, an attractive exercise prescription can offer benefits with the least investment of time (Jakicic, 2003).

Indian common youths who are not associated with competitive sports are increasingly growing the culture of passive participation an exercise & sport and that leads to a health threat to the society. Different physical activities make different demands on the human body and physiological adaptations take place.

This study attempts an experimentation whether, and if so, how much and within which time course a comprehensive exercise training programme can develop the cardiovascular fitness and improve body composition of college-aged males having sedentary lifestyle.

METHODS

Subjects

The sample numbered 60 male students of V.S. Mahavidyalaya at Paschim Medinipur, West Bengal, India, aged 18 to 23. The experimental group numbered 30 male students who participated in organized workouts in the fitness programme. The control

group was made up of 30 male subjects who had not participated in the organized and systematic training sessions of any exercise and sport. The members of the experimental group attended the training sessions of three days of a week regularly and were motivated to exercise.

Variables

For the evaluation of cardiovascular adaptation due to exercise training chosen variables were Resting Heart Rate, Systolic and Diastolic Blood Pressure and the VO₂ max. The following tests were used: The blood pressure and heart rate were measured by calibrated omeron's digital monitor. The VO₂ max was estimated by the bleep test. To observe body composition changes the body mass index was calculated and for that anthropometric measuring were carried out using standard Stadiometer and weighing machine.

The Experimental Programme

The number of training sessions per week: three. Number of weeks: 8, the duration of an individual training session: 60 min, the duration of an individual Training programme: 40 min.

The structure of each individual workout encompassed: a warm-up, the "cardio" part and the cool-down. The warm-up lasted for 10 minutes by using dynamic movement patterns like eight different multi-joint exercises which were used for the purpose of preparing the joints and large

muscle groups for the training part of the exercise which was to follow. The 'cardio' part comprised of moderate intensity aerobic exercises with varied movements & pace for 40 minutes.

The cool-down part of the workout lasted for 10 minutes. During the static stretch exercises the subjects relaxed the tension in their bodies. While performing each exercise, special attention was paid to breathing. The stretch exercises were accompanied by quiet, calm, slow music. Its contents: stretching exercises which simultaneously activated several body parts, and where each exercise was repeated three to four times. The subjects had to remain for at least 10 second, 20 at the most, in the final stretching position.

Data Analysis

The basic statistical parameters were calculated for all the data: the mean, standard deviation. To determine the differences between the initial and final measuring of each variable of the experimental and control group, the t- test was calculated. The data was processed by means of the MS Excel Data Analysis tool pack.

RESULTS**Table: 1**

The basic descriptive statistics and the statistical significance of the difference in the means of the applied variables of Experimental and Control Group.

Variables	Group	Mean & SD	t-test	P-Value
Height	Experimental	1.60 + .099	.88	2.00
	Control	1.59 + 0.057		
Weight	Experimental	53.9 + 5.8	.86	2.00
	Control	55.26 + 5.58		
BMI	Experimental	21.02 + 3.07	1.19	2.00
	Control	21.86 + 2.12		
Resting Heart Rate	Experimental	72.8 + 4.88	1.23	2.00
	Control	74.26 + 3.58		
Systolic Blood Pressure	Experimental	121.6 + 6.11	0.126	2.00
	Control	121.83 + 3.47		
Diastolic Blood Pressure	Experimental	83.9 + 4.47	1.82	2.00
	Control	81.76 + 4.56		
VO2 Max	Experimental	34.36 + 6.58	0.236	2.00
	Control	34.78 + 6.85		

The descriptive characteristics of the subjects are presented in Table 1. Each group contained similar numbers of male subjects: control (30 males), Experimental (30 males). At the base line of the data. There were no significant differences observed at baseline between any of the groups for height, Weight, BMI, Resting Heart Rate, Blood Pressure and VO₂ max.

Table 2.

The Mean, SD and Significant Difference of Cardiovascular Fitness variables and BMI of the Experimental and Control Group After Training

Variables	Control	Experimental	T-value Obtained
BMI	23.46 + 2.60	20.36 + 2.71	4.37*
Resting Heart Rate	76.93 + 3.17	66.6 + 3.30	11.94*
Systolic Blood Pressure	124.46 + 4.41	119.4 + 1.47	5.76*
Diastolic Blood Pressure	81.7 + 1.48	78.96 + 1.20	7.75*
VO2Max	34+5.53	43.69+ 4.37	7.26*

***Significant at 0.05 level=2.00**

Table 2 shows the t-test of cardiovascular fitness and BMI of the experimental and control group at the final measuring. On the basis of the obtained t-value, it can be concluded that there is a statistically significant difference in the values of resting heart rate, systolic and diastolic blood pressure VO2 max and in BMI

between the male subjects of the experimental and control groups.

DISCUSSION

The results of this study indicated that 8- weeks of exercise training including low impact aerobics, strengthening, pace run and flexibility exercises based on progressive load training principle significantly decreased the body mass index; Resting Heart Rate, Resting systolic and diastolic Blood Pressure and significantly increased VO₂max of collage males.

According to the result of the present study the exercising subjects in the experimental group who underwent 60 minutes of training for three days a week and exhibited significant reduction in body weight, body mass index, blood pressure and resting heart rate while the values for the control groups actually not decreased over the same time frame.

The fact that the control group of present study did not lose weight is supported by other research studies that generally reveal that weight loss needs at least 150 minutes of moderate intensity of exercise per week (Saris et al, 2003). Further, the study suggests that three 60-min sessions of exercise training in a week significantly improve VO₂max. This finding is consistent with those of previous researchers (Macfarlane et al, 2006) who demonstrated the efficacy of 150 min of exercise training. Based on the results of the present and earlier studies, the health benefits of physical activity on VO₂max are believed to relate more to the exercise intensity than to the volume (Kemia et al, 2005). Several studies report that the cardiovascular effects vary with the intensity or amount of exercise (Wisloff et al, 2005)

The cardiovascular adaptation related to all selected parameters and improvements in body composition might be highly significant due to the sedentary habits of the young males. As it appears in the initial means of the selected parameters of college boys apparently higher than desirable health status of active youths, physiological adaptation took place largely. This result corroborates with the study of Mikko P. Tulppo et.al, 2003; Shannan E. Gormley et.al.2008.Many studies have revealed that over weight or obese people lose weight and improve in body composition better with a combination of dietary and exercise program than with dietary or exercise program alone (Després and Lamarche, 1993 & Chambliss, 2003).

CONCLUSION:

This research the fact that significant changes occur to the cardiovascular fitness and the body mass index on the examined sample of male subjects under the influence of the balanced exercise training programme. It means that physiological adaptations to cardiovascular parameters, namely the resting heart rate, systolic and diastolic blood pressure and vo₂ max takes place and significantly improves in trained subjects. Besides, body composition improved through positive changes in BMI.

Therefore, the results of this study indicated that 8 weeks of exercise training programme affects the cardiovascular parameters to adapt the training stimulus and also decreased significantly some factors of body composition in sedentary males even in the absence of dietary restrictions.

REFERENCE

1. Bassuk, Shari S.; Manson, JoAnn E. (2003). Physical activity and cardiovascular disease prevention in women: How Much is good enough? Exercise & Sport Science Reviews. The American College of Sports Medicine 31(4): 176-181. | 2. Bouchard, C., Despres, J. P. and Tremblay, A. (1993) Exercise and obesity. Obes. A Research Journal, 1, 133-147. DOI: 10.1002/j.1550-8528.1993.tb00603 | 3. P Ossaaloo, A Zafari, L Najari (2012). The Effects of Combined Training (Aerobic Dance, Step Exercise and Resistance Training) on Body Composition in Sedentary Females. Annals of Biological Research, 3 (7):3667-3670 | 4. Caspersen, C.J., Powell, K.E., Christenson, G.M. (1985). Physical activity, exercise, and physical fitness: definitions and distinctions for health-related research. Public Health Rep., 100, 126-31 | 5. Chambliss, H.O. (2003). Exercise duration and intensity in a weight-loss program. Clin J Sport Med., 29(10), 1323-30. | 6. Després, J. P., and Lamarche, B. (1993). Effects of diet and physical activity on adiposity and body fat distribution: implications for the prevention of cardiovascular disease. Nutr. Res. Rev., 6, 137- 159. doi: 10.1079/NRR19930010. | 7. Tulppo MP, Hautala AJ, Mäkelä TH, Laukkanen RT, Nissilä S, Hughson RL, Huikuri HV. (2003) "Effects of aerobic training on heart rate dynamics in sedentary subjects" Journal of Applied Physiology July 1, vol. 95 no. 1 364-372 | 8. Moradichaleshtori, M., Salami, A., Jafari, A. (2008) "The Effect of Amount of Physical Activity on Cardio Respiratory Fitness and Body Composition" Journal of Exercise Science and Physiotherapy, Vol. 4, No. 2:71-75 | 9. Gormley SE, Swain DP, High R, Spina RJ, Dowling EA, Kotipalli US, Gandrakota R. (2008) "Effect of Intensity of Aerobic Training on VO2max", MedSci Sports Exerc. ;40(7):1336-1343. | 10. World Health Organization [2002]. Reducing risks, promoting healthy life. World Health Report 2002. www.who.int/whr/2002/chapter4/en/index4.html. |