



## Effect of Ageing on Physiological Fitness of Elderly People

**Dr. Ravindra M. Kadu**

**M.P.Ed.M.Phil.. Ph.D. Associate Professor, Shri Shivaji College of Physical Education, Amravati**

### ABSTRACT

Increased life expectancy and growth of graying population has created interest to the researcher on various aspects of ageing to improve the quality of life of the elderly. The purpose of this study to observe the effect of ageing on physiological status of the elderly. For this study 60 males age between 50 to 70 years were selected as subject and they were equally divided into two groups viz. 50-60 years (X-Group) and 61- 70 years (Y-Group). Each group had one experimental group and one control group having 15 subjects in each group. The two experimental groups underwent into the moderate exercise programme includes fast walking, jogging, stretching and cool down for 50 to 70 minutes per week for one year. And two control groups remained sedentary. Pre and post test were conducted after completion of one year on four variables of physiological parameters, viz. Resting Heart Rate (RHR), after Exercise Heart Rate (EHR), Systolic and Diastolic Blood Pressure (SBP & DBP). After comparison of pre and post data of each group, it was observed that RHR did not changed in both control groups (XC & YC) but significant reduction was observed in both the experimental groups (XE & YE) after one year period. ERH change significantly in both the group, as heart rate after exercise was reduced in AE and BE and increased in XC and YC. Whereas SBP and DBP did not change significantly both the control groups (XC & YC), but significant reduction was observed in both experimental group (XE & YE) after one year period. From the above study it is reveals that moderate exercise is a good intervention for maintain a physiological fitness of the elderly to lead a healthy life.

### KEYWORDS

Elderly People, Physiological Fitness, Moderate Exercise

### INTRODUCTION

Functional efficiency of an individual is depends on physiological fitness of different systems of body and it declines with age, but not all the systems decline at the same rate. Researchers observe that some functions related with respiratory organs that show only a moderate ageing effect at rest, may show dramatic changes under the stress of exercise. Because long term exercise studied on the same subjects are scare, it is not known the extent to which regular exercise participation can change the actual rate of decline in physiological functions that normally occurs with increasing age. Regular physical activity can improve physiological fitness regardless of age, but it depends on several functions that include initial fitness status, age and the type of physical training. With regard to the age factor, it has generally been held that older individuals are not able to improve their strength and endurance capacity to the same as younger people. The reasons for this decreased 'trainability' are not well understood, although it is attributed to a general decline in nuro-muscular function and age related impairment in the cells capacity for protein synthesis and chemical regulations (Mc Ardle et. al., 1996). The purpose of this study was to observe the effect of ageing on physiological fitness of elderly people with reference to moderate exercise.

### MATERIAL AND METHOD

Sixty male subjects age between 50-70 years were selected for this study. They were equally divided in two groups from 50 to 60 years and 61-70 years. Each group had one experimental group and one control group having 15 subjects in each group. Physiological fitness of all the subject was measure through heart rate (resting and after exercise heart rate) and systolic and diastolic blood pressure before and after moderate training for one year duration. Resting and after exercise heart rates were measured by most commonly used method. Hard ward's Step Test was used to measure after exercise heart rate.

After pre test one year duration of moderate exercise programme was imparted on both experimental groups includes fast walking, jogging stretching and cool down etc. for 45 to 60 minutes per week. Duration of exercise up to 60 minutes was gradually increased after every tree months. Control

groups used to perform their day to day work during the period. After completion of one year period again data were collected. Pre and post data were analyzed by using SPSS version 10.0. Mean and standard deviation were used as descriptive statistics for all groups. Independent t-test was used to predict inter group difference and pair t-test was used for intra group difference of score in pre and post test. Level of significance difference was  $p < 0.05$ .

### RESULTS

The data presented in the following Table reveals that in case of pre and post values of resting heart rate there was no change in both the control groups (XC and YC) after the one year duration. However, in the two experimental groups (XE and YE) resting heart rates were significantly reduced ( $p < 0.05$ ). Significantly change was observed in both the control group and experimental groups, where reduction in experimental groups and increase in control groups in after exercise heart rate after one year period. Data of the study reveal that there was no significant change in systolic and diastolic blood pressure of both the control groups after the one-year experimental period. However, there was significant reduction in SBP and DBP of both the experimental groups following one-year exercise programme.

**TABLE- Comparison of Pre and Post Physiological Fitness Variables.**

Variables	Group	Pre-Test Mean $\pm$ SD	Post-test Mean $\pm$ SD	t-value (Intra-group) Pre vs Post
Resting Heart Rate (RHR)	XE	71.8 $\pm$ 4.76	69.7 $\pm$ 3.33	2.80
	XC	71.2 $\pm$ 5.93	72.1 $\pm$ 6.04	1.49
	YE	74.3 $\pm$ 6.15	71.6 $\pm$ 5.35	6.02
	YC	67.3 $\pm$ 6.13	68.0 $\pm$ 6.77	1.66
After Exercise Heart Rate (HER)	XE	148.2 $\pm$ 6.83	138.0 $\pm$ 7.77	8.87
	XC	153.0 $\pm$ 11.53	159.7 $\pm$ 10.54	8.98
	YE	138.0 $\pm$ 8.99	128.2 $\pm$ 5.13	6.58
	YC	141.3 $\pm$ 10.66	146.0 $\pm$ 9.84	6.71
Systolic Blood Pressure (SBP)	XE	130.4 $\pm$ 7.76	125.7 $\pm$ 6.64	4.06
	XC	131.1 $\pm$ 10.6	138.8 $\pm$ 8.69	1.98
	YE	128.0 $\pm$ 7.64	124.8 $\pm$ 6.52	4.00
	YC	123.8 $\pm$ 8.69	124.1 $\pm$ 8.13	0.17

Diastolic Blood Pressure (DBP)	XE	83.8±8.87	79.1±5.43	3.30
	XC	81.6±7.79	83.2±6.58	1.63
	YE	86.4±5.94	82.6±4.39	2.68
	YC	77.6±4.45	77.3±5.10	0.22

## CONCLUSIONS

Following conclusions were drawn.

- Resting heart rate of the elderly does not change due to ageing but it could be reduced following exercise.
- After exercise heart rate tends to improve with ageing in the elderly, but active life style, in the form of aerobic exercise, can reverse the trend and maintain a steady state in this physiological process.
- As all the physiological systems of our body tend to change with ageing in the elderly, blood pressure too change with ageing slowly but moderate may control an elderly individual's blood pressure remarkably by controlling the hemodynamic factors and influencing on the ill causes those are suppose to be the factors responsible for hypertension.

Therefore, from the facts and findings of the study we may conclude that active life style with regular exercise can give a good physiological boosting for elderly and thereby they maintain their health and well-being with advancement of age.

## REFERENCES

1. American Heart Association. Heart and stroke: AHA National Centre: (1991) Dallas.
2. Blumenthal, J.A., et. al Psychological and physiological effects of physical conditioning on the elderly. *Journal of Psychosomatic Research*,(1982), 26:505-510.
3. Emes, C.G. 'The Effect of Regular Programme of Light Exercise on seniors, *Journal of Sports Medicine*,(1979) 19: 185-190.
4. Joseph, J.J.'Effect of Calisthenics, jogging and swimming on middle aged men. *Journal of Sports Medicine*. (1974), 14-20.
5. McMurry, R.G. *Concept in fitness Programming*. (1999), New York: CRC Press.
6. Shock, N.W. System Integeation, *The Physiology of ageing*. *American Journal of Clinical Nutrition*, (1977), 36. 750-758.
7. Stamford, B.A. "Exercise and Elderly", *Exercise and Sports Science Review*, Vol. 16, (1988), New York, Macmillan.