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EVALUATION OF PULMONARY FUNCTION TEST AMONG AEROBIC PRACTITIONERS IN CHENNAI

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ABSTRACT:

Exercise is an important factor for the regulation of the body and its movements. Healthy living and physical fitness are closely related. Aerobic exercise is a form of physical exercise that combines rhythmic aerobic exercise with stretching and strength training routines. Pulmonary function test is used to measure the capacity of lungs. It is also used for evaluating the effective functioning of lungs. The main aim of this study is to explore detailed information about pulmonary function tests among aerobic practitioners. This study was conducted among 40 individuals which involved 20 aerobic practitioners and 20 normal individuals (control group). Lung function is measured using an electronic spirometer. Subjects were given instructions before the test. Data collected was analysed statistically. From this study, it is found that aerobic practitioners have more lung capacity when compared with the control group. When compared with other studies, this study gives a better result about the benefits of aerobic exercise. Also the values calculated are significant. It is concluded that people who do exercise have more lung capacity compared to normal people. Exercise also increases the efficiency of the respiratory system. So to lead a healthy and

happy life, exercise plays a major role. Also this study creates awareness among the public about the benefits of regular exercise.

INTRODUCTION

Healthy living and physical fitness are closely related. Physical activity is known to improve physical fitness and to reduce the mortality and morbidity from numerous chronic diseases (Bakken *et al.*, 2001). One such program is aerobics or cardiovascular fitness. Aerobic exercise is an important component of pulmonary rehabilitation for patients with cardiac and pulmonary diseases. It helps to keep the mind and body in a healthy condition. It regulates the metabolism of the body. Major benefits of aerobic exercise are, it increases the efficiency of respiration, improves blood volume and distribution of blood to all parts of the body and cardiovascular efficiency is increased by doing aerobic exercise. Some of the aerobic exercises are running, swimming, walking, hiking. Aerobic exercise can become anaerobic exercise if it is performed at a high level of intensity (Bhuvaneswari, no date), (Bernard *et al.*, 1999). Pulmonary function test is a non invasive test that shows the efficiency of lungs. Lung function tests also vary in different settings with results suggesting, lung function is governed by the environmental, genetic and nutritional factors (Womack *et al.*, 2000). This test can help the physicians to diagnose and decide the treatment of certain lung disorders.

Some research done on pulmonary function has explored the relation between the yoga and respiratory function, which aids in understanding the mechanism of how yoga improves the quality of life and finds a better way to evaluate the effects of pulmonary rehabilitation, also a study related to yoga has concluded that yoga has a beneficial effects on respiratory and cardiovascular systems when practised regularly (Reddy, Sreehari and Khan, 2015), (Ganguly and Gharote, 1974). Another study has concluded that breathing exercise improves the respiratory function after regular training (Jones and Carter, 2000).

The aim of the study is to evaluate the pulmonary function between the aerobic practitioners and to compare with the normal people. Also this study creates awareness among the public about the benefits of regular exercise.

MATERIALS AND METHOD:

This study **was** carried out among 40 individuals which involved 20 aerobic practitioners and 20 control groups of individuals. Subjects are in an age group between 18- 45 yrs. Computerised spirometer is used for this test. Subjects were given instructions before the test. Subjects are advised to block their nose after a deep inspiration and the air is blown out with a maximum force into the spirometer. Later the values are calculated and graphs are made with standard errors.

Spirometer is programmed to measure various pulmonary functions. The values measured are the FVC, FEV1, FEV1/ FVC and P value. These are the protocols used in this study. The statistics followed in this study is an unpaired T test.

Inclusion Criteria:

1. Subjects with age group between 18- 45yrs.
2. Subjects undergoing regular aerobic exercises.

3. For the control group, subjects selected are non smokers and individuals not undergoing aerobic exercises.

Exclusion Criteria:

1. Subjects with a history of any major surgery and history of existing illness of DM type II, HTN, Metabolic syndrome
2. Subjects with a history of smoking, alcohol and tobacco.

RESULTS AND DISCUSSION

The mean values of lung function parameters were recorded, and the following parameters were taken into consideration, and the values obtained were recorded. The best value from the measurements was used and recorded by a spirometer. Predicted values were calculated by the standard formulae originally programmed in the spirometer. The parameters chosen were FVC, FEV1, FEV1/FVC and PEF, ratios were analysed for both the control group and the aerobic practitioners are shown in the table.1.

Mean values of FVC of the control group (2.55) and aerobic people (4.27) and the difference was found statistically significant. This result is shown in Figure.1. Similarly, it was found that the mean value of FEV1 of the control group (2.06) was less when compared to the aerobic practitioners (3.95) as shown in Figure.2 and it is statistically significant. The mean of predicted PEF among control groups (4.55 L) and aerobic practitioners (6.81 L). Also the FEV1/FVC ratio shows significant (Figure.3). The mean value of PEF observed among the control group compared to aerobic practitioners was highly significant (Figure.4).

In this present study, we studied effects of aerobic exercise on respiratory parameters like FVC, FEV1. We found a significant increase in both the values, when testing with the aerobic practitioners (Vignesh, Preetha and Gayatri Devi, 2018). Our findings are similar to the findings related to other studies done on aerobic exercises in the Coimbatore population (Pradeepa, 2014). Other studies have also reported similar improvement in lung function after practicing aerobic exercises which was done in the Uttar Pradesh population (Singh *et al.*, 2010). By comparing the present study with the yoga practitioners, the results are almost the same (Rampello *et al.*, 2007). The health related aspects of physical fitness, defined as the isokinetic muscle strength and endurance, general flexibility, cardiopulmonary endurance, and body consumption as well as pulmonary functions were evaluated for the subjects (Sutherland, 1998). Significant increases were found in the subjects practicing aerobic exercise. To lead a healthy life, we need to do exercise regularly. From the study, it is clearly understood that the significant value is decreased in normal people compared with aerobic people (Angane and Navare, 2017). FEV1/FVC values are significant in both the cases. But the values are greater for the aerobic people when compared with normal people (Whelton *et al.*, 2002). By doing exercise, we can maintain our metabolism and also it keeps our brain stress free and calm (Segar *et al.*, 1998).

Many studies have been done the pulmonary function test by comparing the diseased people with the normal people, IT employees with normal people. These studies have shown the importance of pulmonary ventilation (Kodama *et al.*, 2009).

This study creates awareness among the public about the maintenance of their body's metabolic rate (Dimeo *et al.*, 1997). Also it encourages the people

to do simple exercise like running, doing yoga, as it is a part of exercise. This helps them to lead a happy and healthy life. This study was well done and utilized direct measures of cardiopulmonary fitness; however, the sample size was small and predominantly male, the training time also short.

Table 1: Table shows the significance in the aerobic and normal people. It is significant in both the cases, but it is greater in aerobic practitioners compared with control groups. * Represents Significance, (p<0.05).

PARAMETERS	AEROBIC PEOPLE Mean value	CONTROL GROUP Mean value.	SIGNIFICANCE	P Value
FVC (L)	4.27 ±0.764	3.25 ± 0.391	Significant	0.0044*
FEV1(L)	3.7 ±0.770	2.6±0.332	Significant	0.0013*
FEV1/FVC %	86.85%	80.00%	significant	0.0092*
PEF	4.81±1.561	4.2±1.096	Significant	0.0073*

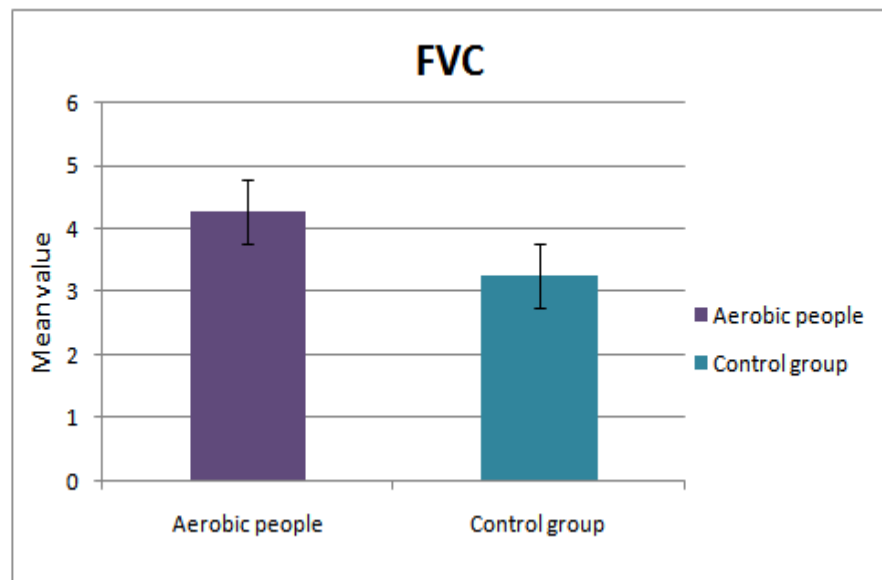


Figure.1 shows the Forced vital capacity FVC of aerobic practitioners and the control group. In this graph, Aerobic people have greater FVC value compared to the normal people (control group). Unpaired T test was done and it was found to be statistically significant

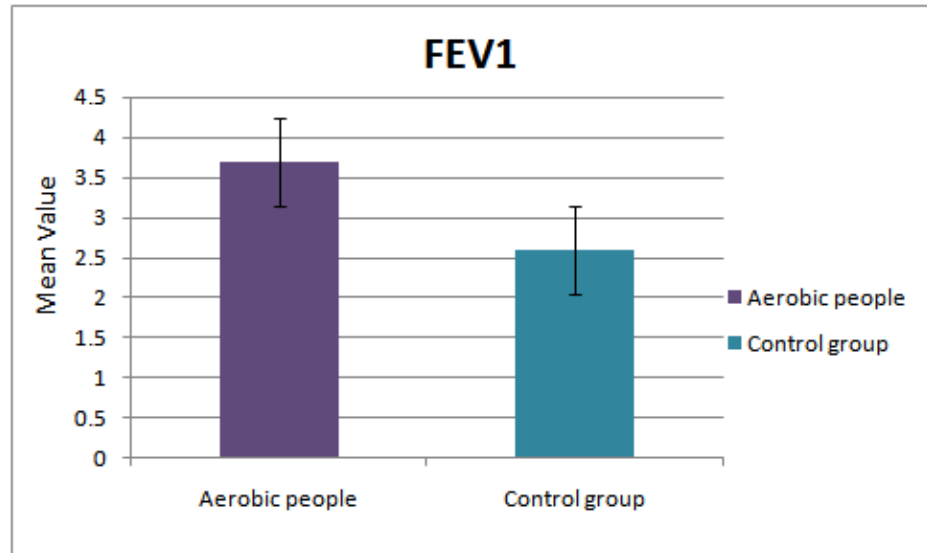


Figure.2 shows the volume of air expired out in the 1st second FEV1 of aerobic practitioners and the control group. In this graph, Aerobic people have greater FEV1 value compared to the normal people (control group). Unpaired T test was done and it was found to be statistically significant

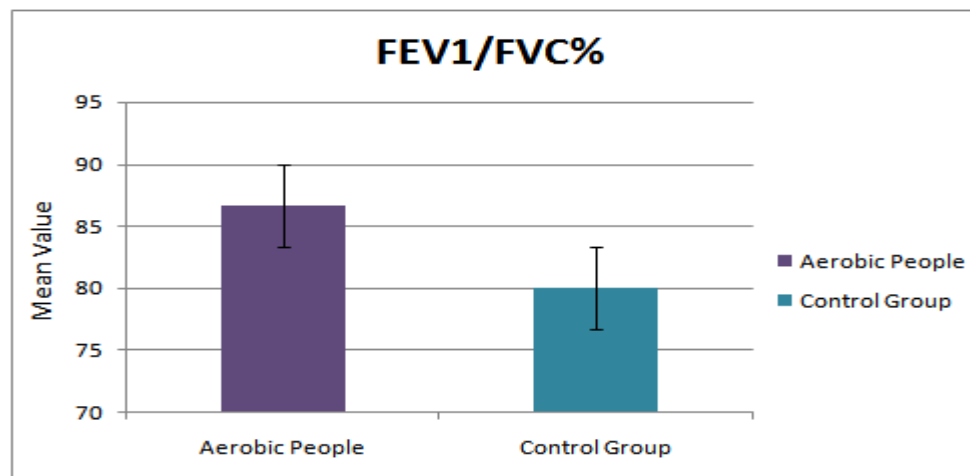


Figure. 3 shows the ratio of FEV1/FVC% in both the aerobic and the control group peoples. In this graph, Aerobic people have greater FEV1/FVC% value compared to the normal people (control group). Unpaired T test was done and it was found to be statistically significant

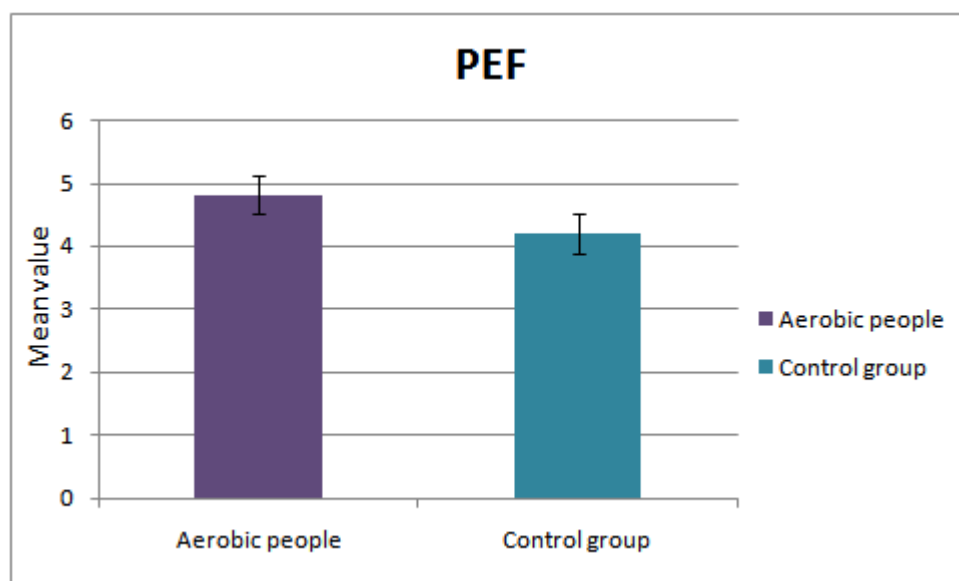


Figure.3 shows the PEF value of aerobic practitioners and the control group. In this graph, Aerobic people have greater PEF value compared to the normal people (control group). Unpaired T test was done and it was found to be statistically significant

CONCLUSION

Within the limitations of the present study it can be concluded that there is a significant increase in Pulmonary function parameters in individuals doing aerobic exercise. Thus practicing aerobic exercise seems to increase the pulmonary function rate and the respiratory efficiency, which was indicated in the present study and doing exercise can also increase the lung capacity, which keeps the body in a healthy state.

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REFERENCES

- Angane, E. Y. and Navare, A. A. (2017) 'Effects of aerobic exercise on pulmonary function tests in healthy adults', *International J Research in Medical Sciences*, 4(6), pp. 2059–2063.
- Bakken, R. C. et al. (2001) 'Effect of aerobic exercise on tracking performance in elderly people: a pilot study', *Physical therapy. academic.oup.com*, 81(12), pp. 1870–1879.
- Bernard, S. et al. (1999) 'Aerobic and strength training in patients with chronic obstructive pulmonary disease', *American journal of respiratory and critical care medicine. atsjournal.org*, 159(3), pp. 896–901.
- Bhuvanewari, T. (no date) 'Diabetes mellitus alters the pulmonary function test parameters among the patients attending regular check-up in tertiary care hospital in and around Chennai-Evidence-based study', *iaimjournal.com*. Available at: https://iaimjournal.com/wp-content/uploads/2017/11/iaim_2017_0411_01.pdf.

- Dimeo, F. et al. (1997) 'Effects of aerobic exercise on the physical performance and incidence of treatment-related complications after high-dose chemotherapy', *Blood*. ashpublications.org, 90(9), pp. 3390–3394.
- Ganguly, S. K. and Gharote, M. L. (1974) 'Cardiovascular efficiency before and after yogic training', *Yoga Mimansa*, 17, 1, 89, 97.
- Jones, A. M. and Carter, H. (2000) 'The effect of endurance training on parameters of aerobic fitness', *Sports medicine*. Springer, 29(6), pp. 373–386.
- Kodama, S. et al. (2009) 'Cardiorespiratory fitness as a quantitative predictor of all-cause mortality and cardiovascular events in healthy men and women: a meta-analysis', *JAMA: the journal of the American Medical Association*. jamanetwork.com, 301(19), pp. 2024–2035.
- Pradeepa, M. (2014) Effect of aerobic exercises on self esteem among school children at selected schools, Coimbatore. masters. College of Nursing, Sri Ramakrishna Institute of Paramedical Sciences, Coimbatore. Available at: <http://repository-tnmgrmu.ac.in/6297/> (Accessed: 28 June 2020).
- Rampello, A. et al. (2007) 'Effect of aerobic training on walking capacity and maximal exercise tolerance in patients with multiple sclerosis: a randomized crossover controlled study', *Physical therapy*. academic.oup.com, 87(5), pp. 545–555.
- Reddy, L. R., Sreehari, P. and Khan, M. I. (2015) 'Effect of yogic exercises (pranayama) on pulmonary function tests', *J Cont Med A Dent*. pdfs.semanticscholar.org, 3(1). Available at: <https://pdfs.semanticscholar.org/5730/7065985bc5d7bb3ac500b0253d3451e9242b.pdf>.
- Segar, M. L. et al. (1998) 'The effect of aerobic exercise on self-esteem and depressive and anxiety symptoms among breast cancer survivors', *Oncology nursing forum*. ncbi.nlm.nih.gov, 25(1), pp. 107–113.
- Singh, M. et al. (2010) 'Effect of aerobic and anaerobic exercise on basal metabolic-rate', *British journal of sports medicine*. British Association of Sport and Exercise Medicine, 44(Suppl 1), pp. i26–i26.
- Sutherland, C. W. (1998) 'Effects of aerobic exercise on the physical performance and incidence of treatment-related complications after high-dose chemotherapy', *ONS Nursing Scan in Oncology*. Nursecom, Inc., 7(2), p. 12.
- Vignesh, P., Preetha, S. and Gayatri Devi, R. (2018) 'Assessment of pulmonary function test in athletes', *Drug Invention Today*. search.ebscohost.com, 10(12).
- Whelton, S. P. et al. (2002) 'Effect of aerobic exercise on blood pressure: a meta-analysis of randomized, controlled trials', *Annals of internal medicine*. acpjournals.org, 136(7), pp. 493–503.
- Womack, C. J. et al. (2000) 'Weight loss, not aerobic exercise, improves pulmonary function in older obese men', *The journals of gerontology. Series A, Biological sciences and medical sciences*. academic.oup.com, 55(8), pp. M453–7.