



**VITAL CAPACITY: ANALYSIS OF THE EFFECTS OF AEROBIC DANCE AND
PRANAYAMA**

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Abstract

This paper aims to analyse the effects of aerobic dance and pranayama on vital capacity of college students. Total Ninety (N=90) students were selected will from Ramgarhia College of Engineering and Technology, Phagwara; Guru Nanak College, Phagwara and Lyallpur Khalsa College, Jalandhar as subjects for this study. Further, they were divided into equal group of thirty (N=30) students. The Group-I known as Aerobic Dance group, Group-II known as pranayama group and Group-III considered as control group for experiment. Mean and S.D. are calculated and analysis of co-variance was applied to find out the significantly better group through S.P.S.S. Further Scheffee,s test was applied to find out the difference between the adjusted post-test mean among three groups. The significant level was chosen at 0.05. The findings of study concluded that aerobic dance training and pranayama are very effective exercises which significantly improve the vital capacity of experiment groups. On the other hand control groups did not report any type of changes on vital capacity. Aerobic dance training and paranyama can be used as vital capacity enhancing tool by students. Both aerobic dance training and pranayama are useful methods which can be helpful to improve the health of the college students and the society in general.

Keyword: vital capacity, aerobic dance, pranayama, physiological variables.



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Introduction

The vital capacity is an important ability which is interlinked with individual's respiratory health. Kent (2006) defined that, "vital capacity is maximum volume of air forcefully expired after maximal inspiration." Vital capacity is influenced by many types of physical trainings i.e. running, swimming, weight training, cycling, dancing and yogic practices. The above given physical training process helps to improve physical and physiological variables to attain good health. Nowadays, aerobic dance and pranayama are commonly used to maintain good health by individuals. Wiggins et al. (2005) stated that, "aerobic capacity is the ability of the cardiovascular system to take in and transport oxygen to the working muscles where it can be utilized and aerobic performance maintained". Aerobic fitness involves many important organs and tells much about the health in general. When aerobic fitness improves, physical and mental health enhances. Physical fitness prepares the body to perform strenuous activity without getting fatigue. Mental fitness prepares the mind to face tough tasks and challenges. Karageorghis & Terry (2001) argued that aerobic dance exercise is one of the most common exercise practices in the world. Many experts emphasised that exercising to music, did not require any costly equipment or space, which made dance aerobics very popular in urban areas. Aerobics is a form of physical exercise that combines rhythmic aerobic exercise with stretching and strength. Aerobic dance is a type of exercise that overloads the heart and lungs and causes them to work harder. When appropriately performed on a regular basis, aerobic exercise helps to increase maximal oxygen uptake (Roitman et al., 2001). Aerobic fitness can be defined as the ability to transport and utilize oxygen. Moreover, aerobic dance demands a group organization of the exercise and accompanying music of a certain tempo and rhythm and to develop cardiovascular fitness (Kostić, et al. 2006). According to Shaw & Tomar (2000) aerobic dance is to move rhythmically in a series of steps along with a partner or group music. Sunder (2009) stated that aerobic activities include walking, jogging, bicycling, dancing and swimming where large muscle group involves and sustains for thirty minutes or longer. It should be done a minimum of five days a week for at least thirty minutes of each session. While doing step aerobic exercises, heart plays a key role to circulate the blood which contains nutrients and oxygen. Above given literature shows that aerobic dance is a kind of rhythmic exercise that involves music and develops cardiovascular fitness. The increased capacity and adaptability associated with aerobic fitness can add life to years, not just years to your life. Length of life has meaning not only in calendar years but also in the quality of life preserved. Quality of life may be assessed in various ways related

to fitness, fulfilment and satisfaction. Experts have introduced a set of rhythm exercises or activities which are termed as aerobics. These activities vary from simple movements like free hand exercise to slightly complex and co-ordinated movements like twisting, jumping and dancing. There are various forms of aerobics exercises used by people to attain and maintain good health.

Pranayama is an important and essential part of yoga. Kamlesh (2013) defined that, "Yoga is the process which indicates the effect of the individual self to achieve union or communion with supreme self." Yogic breathing techniques are termed as pranayama. The Pranayama is the process by which the internal pranic store is increased. Some people split the word Pranayama into prana and yama and define it as breath control. Subbalakshmi et al. (2005) explained that pranayama literally means control of prana and refers to all forms of energy in the universe. Sovik (2000) mentioned that the ancient science of breath is called pranayama which meaning both control of energy and expansion of energy. Generally we state that pranayama is the regulation of the breath through certain techniques and exercises and closely associated with health of individuals. Keeping in view the importance of aerobic dance and pranayama that study in hand taken to check the effects of aerobic dance training and pranayama practices on vital capacity of college students.

Methodology

Sample: Total Ninety (N=90) students selected from Ramgarhia College of Engineering and Technology, Phagwara; Guru Nanak College, Phagwara and Lyallpur Khalsa College, Jalandhar as subjects for this study. Further, they were divided into equal group of thirty (N=30) students. The Group-1 known as Aerobic Dance group, Group-II known as pranayama group and Group-III considered as control group.

Procedure: The experiment programmes of aerobic dance training and pranayama was implemented for 8 weeks. Aerobic dance includes Dance on Music, Step Up, Jumping Jack, Over the Top & A-Step for 5 Minutes on each station with 2 minutes rest in between each station. Pranayama experiment includes Kapalbhathi, Bharmari, Palvini & Sheetli for 8 Minutes for each type of Pranayama with 2 minutes rest in between each type of Pranayama. First 5 days of week was chosen for 60 minutes of experiments. Further, sixty minutes divided into 10 minutes for warming up, 40 minutes for main experiments and 10 minutes for cooling down.

Statistical Techniques: Mean and S.D. are calculated and analysis of co-variance was applied to find out the significantly better group through S.P.S.S. Further Scheffee,s test was

applied to find out the difference between the adjusted post-test mean among three groups. The significant level was chosen at 0.05.

Results And Discussion

The results of experiment group-I, experiment group-II and control groups are presented and graphical representation of mean scores given accordingly.

Table-1: Analysis Of Covariance On Vital Capacity Of Aerobic Dance, Pranayama And Control Groups

| Test | Aerobic Dance Group | Pranayama Group | Control Group | Source of Variance | Sum of Squares | df | Mean Squares | Obtained 'F' Ratio |
|---------------------------|---------------------|-----------------|---------------|--------------------|----------------|----|--------------|--------------------|
| Pre-test | | | | | | | | |
| Mean | 1565.00 | 1538.67 | 1553.03 | Between | 1485.28 | 2 | 742.64 | 0.052 |
| S.D. | 384.01 | 350.20 | 172.59 | Within | 1242493 | 87 | 14281 | |
| Post-test | | | | | | | | |
| Mean | 1821.83 | 1898.33 | 1554.27 | Between | 18063.6 | 2 | 9031.8 | 7.44* |
| S.D. | 437.82 | 417.84 | 169.29 | Within | 105613 | 87 | 1213.9 | |
| Adjusted Post-test | | | | | | | | |
| Mean | 1808.64 | 1912.33 | 1553.47 | Between | 3452.8 | 2 | 1726.4 | 40.37* |
| | | | | Within | 3677.74 | 86 | 42.764 | |

* Significant at 0.05 level of confidence.(The table values required for significance at 0.05 level of confidence for 2 and 87 & 2 and 86 are 3.114 and 3.115 respectively).

Table-1 showed that the pre-test mean and S.D. values on vital capacity for aerobic dance, pranayama and control groups were 1565.00, 384.01; 1538.67, 350.20; and 1553.03, 172.59 respectively. The obtained 'F' ratio value of 0.052 for pre-test score of aerobic dance, pranayama and control groups on vital capacity was less than the required table value of 3.114 for significance with df 2 and 87 at .05 level of confidence. The post-test mean and S.D. values of vital capacity for aerobic dance, pranayama and control groups were 1821.83, 437.82; 1898.33, 417.84 and 1554.27, 169.29 respectively. The obtained 'F' ratio value of 7.44 for post-test scores of aerobic dance, pranayama and control groups was more than the required table value of 3.114 for significance with df 2 and 87 at .05 level of confidence. The adjusted post-test mean values of vital capacity for aerobic dance, pranayama and control groups were 1808.64, 1912.33 and 1553.47 respectively. The obtained 'F' ratio value of 40.37 for adjusted post-test scores of aerobic dance, pranayama and control groups were more than the required table value of 3.115 for significance with df 2 and 86 at .05 level of confidence.

The result of this study showed that there was a significant difference between aerobic dance, pranayama and control groups on vital capacity. Further to determine which of the paired means had a significant difference that Scheffe’s test was applied and the results are presented in Table-2.

Table-2: Schefee’s Test For The Difference Between The Adjusted Post-Test Mean Of Vital Capacity

| Adjusted Post Test Means | | Mean Difference | |
|--------------------------|-----------------|-----------------|---------|
| Aerobic Dance Group | Pranayama Group | Control Group | |
| 1808.64 | 1912.33 | | 103.69 |
| | 1912.33 | 1553.47 | 358.86* |
| 1808.64 | | 1553.47 | 255.17* |

* Significant at .05 level of confidence.

Table-2 shows that the adjusted post-test mean difference on vital capacity between aerobic dance, pranayama and control group were 103.69, 358.86 and 255.17 respectively. Since the adjusted post-test mean difference between aerobic dance and pranayama were not found significant. The adjusted post-test mean difference between aerobic dance and control group; pranayama and control group was higher than the confidence interval at 0.05 level.

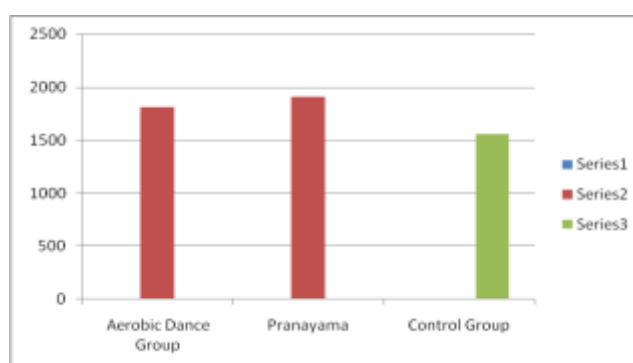


Figure – 1: Comparison Of Mean Values Of Aerobic Dance, Pranayama And Control Groups On Vital Capacity

Discussion

The findings of the study reveals that aerobic dance training and pranayama training significantly help to improve vital capacity of college level students. The aerobic dance, which actually involves very deep breathing, can increase one’s gas exchange at the alveoli-

capillary exchange surface. There would have to be concomitant increase in pulmonary capillarisation in order to make increased lung area effective as a gas exchange area of increased breath holding time. Basal metabolic rate (B.M.R.) is the number of calories used by the body when it is at rest. B.M.R. can remain increased after 30 minutes of moderate physical activity. For aerobic dance, more blood must be supplied to the working tissues. This means the heart will have to pump more blood and also more oxygen should reach the muscles by increased rate of respiration. Oxygen helps to burn the calories more efficiently. The aerobic dance training helps the persons to achieve better oxygen-carbon dioxide exchange, resulting in better oxygen utilization, slower rate of breathing and vital capacity. If body weight reduces, we can easily do the aerobic dance or any other activity without any breathing problems. Chakraborty (1983) reported that dance training helps to improve physiological aspects of individuals. The concept of pranayama is often mistaken for deep breathing. In the later situation, movement of breath is fast and forceful. There is no time for the cells to get soaked in the inhaled oxygen. In pranayama, the movements are so slow that there is adequate time for every alveolus to soak in oxygen. The venous return is much better due to phase's changes in breathing. Elasticity of the lungs and the entire respiratory tract is maintained to a ripe old age. Gautam and Diwedi (2008) concluded that yogic exercises are definitely beneficial for increasing vital strength of the lungs. Kocher (1974) emphasised that yoga exercise improve physiological variables of human body. The haemoglobin/oxygen saturation is enhanced during kumbhaka, as there is enough time for saturation. The vital capacity and inspiratory volumes are increased and residual lung volume decreased as more complete exhalation is performed. The alveoli are exercised, which promotes excellent excretion of toxins and gases. The healthy movement of diaphragm massages the abdominal organs, improving their blood supply and aiding the venous drainage to the thoracic cavity. So, the lungs become healthy and powerful, a good insurance against respiratory problems. The

results of previous studies conducted by Kumar & Elangovan (2011) & Auvai (2013) reported that yoga helpful to improve physiological parameters and health of participants. The results support that aerobic dance training and pranayama needs to practice for good physiological health of students.

Conclusion

The findings of study concluded that aerobic dance training and pranayama are very effective exercises which significantly improved the vital capacity of experiment groups. On the other hand control groups did not report any changes on vital capacity. Aerobic dance training and pranayama can be used as vital capacity enhancing tool by students. Both aerobic dance training and pranayama are useful methods which can be helpful in improving the health of college students and society in general.

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