

**EFFECTIVENESS OF DEEP BREATHING EXERCISE VERSUS ACBT TRAINING TO INCREASE CARDIOVASCULAR FITNESS IN ADOLESCENCE (TEENAGERS)**

Author Priya Mishra, Dr.Navjyoti Gupta, Dr Vinod Nair

**ABSTRACT**

**BACKGROUND:** Cardiovascular fitness, often referred to as cardiovascular endurance or aerobic fitness, is a crucial health-related component of physical fitness. It is the ability of the cardiovascular system (heart and blood vessels) to efficiently transport oxygen and nutrients to the body's tissues and remove waste products during sustained physical activity. Cardiovascular fitness, also known as aerobic fitness, is a fundamental aspect of overall physical health that encompasses the coordinated functioning of the heart, lungs, and muscles to efficiently utilize the oxygen obtained through breathing.

**AIMS AND OBJECTIVES:**

Comparison between effectiveness of deep breathing exercise versus ACBT training to increase cardiovascular fitness in adolescence (teenagers). 1) To evaluate the effectiveness of Deep breathing exercise to increase cardiovascular fitness in Adolescence (Teenagers). 2) To evaluate the effectiveness of ACBT Training to increase cardiovascular fitness in Adolescence (Teenagers). 3) To compare the effectiveness between ACBT Training versus Deep Breathing Exercise to increase cardiovascular fitness in Adolescence (Teenagers).

**METHODOLOGY:**

Comparative study design. 40 40 Adolescence (teenagers) were randomly selected according to inclusion and exclusion criteria and were divided into two groups – Group A: Deep breathing exercises

Group B: ACBT training Duration of Study: 30 minutes per day, 4 days a week, a total of 12 Weeks

#### CONCLUSION :

The result of the study concluded that after 12 weeks of intervention, both group A and group B (Deep breathing exercises and ACBT) were significantly effective in improving cardiovascular fitness. But the group B (ACBT Training) shows significantly more improvement than group A (Deep Breathing exercises).

#### **ABBREVIATON**

Vo<sub>2</sub>max : Maximal Oxygen Consumption

DB : Diaphragmatic Breathing

ACBT : Active cycle of breathing Exercise

FET : Forced Expiration Technique

PPC : Post Pulmonary Complication

HR : Heart Rate

HF : Heart Failure

COPD : Chronic obstructive pulmonary disease

DBE : Deep breathing Exercise

PEF : Peak Expiratory Flow

6 MWT : 6 minute walk test

RR : Respiratory Rate

DB : Deep breathing

#### **INTRODUCTION**

Cardiovascular fitness, often referred to as cardiovascular endurance or aerobic fitness, is a crucial health-related component of physical fitness. It is the ability of the cardiovascular system (heart and blood vessels) to efficiently transport oxygen and nutrients to the body's tissues and remove waste products during sustained physical activity. Cardiovascular fitness, also known as aerobic fitness, is a fundamental aspect of overall physical health that encompasses the coordinated functioning of the heart, lungs, and muscles to efficiently utilize the oxygen obtained through breathing.

Benefits associated with cardiovascular exercise and physical activity:

- \* Reduce intra-abdominal fat stores
- \* Increased muscle strength
- \* Improved sleep
- \* Improved bone density

### **METHODS AND PROCEDURE**

As it is comparative study I have taken 40 Adolescence (Teenagers) will be randomly Selected According to inclusion and exclusion criteria and will be divided into two groups-

Group A: Deep breathing exercise

Group B: ACBT training

And the duration of my study is 20 minutes per day, 4 days in a week. Total 12 Weeks with the outcome measures of -

1. 6 Minute Walk Test
2. Spirometry

As I have taken two groups in which one group is performing deep breathing exercise and the another group is performing active cycle of breathing exercise with the 30 min. of each session.

deformity.

## PROCEDURE

The written consent form was collected from the patients selected by inclusion and exclusion criteria and divided into two groups- group A and group B.

Group A: Deep Breathing Exercise

Group A: Deep Breathing Exercise Treatment Protocol

Duration: 12 weeks

Frequency: Three times per week

Session Duration: 30 minutes per session

Session Structure: Warm-Up (5 minutes):

Gentle stretching and relaxation exercises to prepare the body for deep breathing. Introduction to Deep Breathing (5 minutes): Explains the principles of diaphragmatic breathing. Emphasis on slow, controlled inhalation and exhalation. Diaphragmatic Breathing (10 minutes): Diaphragmatic breathing in a comfortable seated or lying position. Progressive Deep Breathing (10 minutes): Participants engage in gradual deepening of breaths, increasing lung expansion with each inhalation. Focus on full inhalations and complete exhalations. Variations of Deep Breathing (5 minutes): Introduces variations of deep breathing techniques, such as paced breathing or patterned breathing.

Relaxation and Cool Down (5 minutes): guided through a relaxation phase, promoting a sense of calm and well-being. Gentle stretches to release tension in the body.

Group B: ACBT training for 12 weeks as 2 times per week and Duration is 30 minutes per session.

Introduction and Pre-Assessment (5 minutes):

Explain the components of the Active Cycle of Breathing Techniques

(ACBT) Participants' lung function and respiratory symptoms are

assessed. Breathing Control Phase (10 minutes): guide to practice

controlled, slow breathing to optimize lung ventilation. Emphasis on

relaxing and using diaphragmatic breathing. Thoracic Expansion

Exercises (10 minutes): Participants engage in various thoracic

mobility exercises, deep inhalations and relaxed exhalations. These

exercises aim to improve chest expansion and lung capacity. Forced

Expiratory Techniques (10 minutes): Participants practice forced

exhalation techniques, such as huffing or forced coughing. These

techniques facilitate airway clearance and improve respiratory

efficiency. Cool Down and Relaxation (5 minutes): Gentle stretching

and relaxation exercises to ease tension in the chest.

## **DISCUSSION**

Forty adolescence (teenagers) of age group between 15-19 years were randomly selected according to inclusion and exclusion criteria and divided into two groups with 20 numbers in each group.

### **ANALYSIS OF POST-TEST VALUES OF 6MWT BETWEEN GROUP A AND GROUP B**

This study aimed to compare the effectiveness of deep breathing exercises and ACBT training to increase cardiovascular fitness in adolescence (teenagers).

Breathing has a close relationship with autonomic nervous system function.

The phrenic nerve that controls the movement of the diaphragm is connected

to the vagus (parasympathetic) nerve. Decreasing the respiratory rates (RR) by Deep breathing (DB) activates the parasympathetic nervous activity while suppressing the sympathetic nervous activity. Chang et al. reported that slow breathing with eight breaths/min makes the balance of the parasympathetic nervous activity dominant. Autonomic dysfunction, for example, a reduction in heart rate variability, is associated with an increased risk of cardiovascular mortality and morbidity. Hyperactive sympathetic nervous activity and hypoactive parasympathetic nervous activity can be regulated by DB, which will improve cardiovascular health. In addition, yoga practice tends to tune the brain toward a parasympathetically driven mode and positive states.

This study demonstrated that ACBT exercises have a modest effect on lung volumes. ACBT is a cycle of breathing control, thoracic expansion and forced expiratory technique routinely used in respiratory disorders (Smith and Ball, 1998). Traditionally these exercises are said to be used for clearance of bronchial secretions, lung function improvement and strengthening of the respiratory muscles (Porter, 2003).

ACBT also facilitate improvement in cardiorespiratory symptoms in conditions such as heart failure (Collins, 2005). Physiologically these exercises are said to promote maximum air entry by reducing bronchospasms and utilizing collateral ventilation to promote alveoli expansion.

## **CONCLUSION**

From the result of the study concluded that after 12 weeks of intervention, both group A and group B (Deep breathing exercises and ACBT) were significantly effective in improving cardiovascular fitness. But the group B (ACBT Training) shows significantly more improvement than group A (Deep Breathing exercises).