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ORIGINAL ARTICLE

COMPARISON OF THE EFFECTIVENESS OF BUTEYKO BREATHING TECHNIQUE VERSUS DIAPHRAGMATIC BREATHING TECHNIQUE IN ASTHMATIC PATIENTS

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ABSTRACT

Background: Asthma is the condition in which the airways narrow and swell and may produce extra mucus. This can make breathing difficult and trigger coughing, shortness of breath, a whistling sound (wheezing) when we breathe out. Exposure to various irritants and substances that triggers allergies (allergens) can trigger signs and symptoms of asthma. **Objective:** The purpose of this study was to assess and compare the effectiveness of buteyko breathing technique versus diaphragmatic breathing technique in asthmatic patients. **Methods:** A sample of 30 patients within the age group of 20-55 years with Asthmatic patients were randomly divided into two groups, Group A (n= 15) and group B (n= 15). The subjects in group A are treated with buteyko breathing technique. The subjects in group B are treated with diaphragmatic breathing technique. The subjects were used to diagnose lung capacity by FEV1 and PEFr. The pre and Post test results were tabulated and assessed. **Results:** Data analysis revealed statistically significant difference between both groups and proved that the Buteyko Breathing therapy is effective than Diaphragmatic Breathing therapy in asthmatic patients. **Conclusion:** This study concluded that the Buteyko Breathing therapy was more effective than Diaphragmatic Breathing therapy in asthmatic patients. Buteyko breathing exercises reduced the asthma symptoms and helps in increasing the quality of life for asthma patients.

Keywords: Buteyko breathing exercises, Diaphragmatic Breathing exercise, FEV1 (forced expiratory volume in 1 second), PEFr (Peak Expiratory Flow Rate)

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INTRODUCTION

Breathing is essential to life it affects all body parts functions. Asthma is a necessary health condition in both developing and developed countries. Asthma is a condition in which the airways narrow and swell and may produce extra mucus. Asthma is a serious global health problem with wide differences in prevalence and severity in countries throughout the world¹. It is a chronic respiratory disease characterized by airflow obstruction, bronchial hyper responsiveness, and underlying airway inflammation.

Approximately 339 million individuals worldwide are impacted by it, including both younger and older generations. Asthma ranks among the top 20 causes of years lived with disability and accounts for a high global burden of death and disability—roughly 1000 people die from it every day. The asthma prevalence increasing in the developing countries. Asthma prevalence is rising and placing a significant financial burden on society¹¹.

Although asthma cannot be cured, its symptoms can be managed. Since asthma frequently evolves with time. One of the most prevalent chronic illnesses worldwide is asthma. A disordered breathing pattern is typical among asthmatics. The aberrant patterns in asthma are based on breathing patterns. Buteyko Breathing Technique (BBT) is one such method that is becoming more and more well-liked

The main goal of the Buteyko "package" is to lower hyperventilation by combining controlled breathing reduction periods, also referred to as "slow breathing" and "reduced breathing,"

with breath holding intervals, often referred to as "control pauses" and "extended pauses²."

Diaphragmatic breathing technique is the pattern of breathing utilizing the diaphragm which is the chief inspiratory muscle. Diaphragmatic breathing increases relaxation, lymphatic flow & efficiency of gaseous exchange, most important to maintain proper health of muscles and tissues. Breathing has substantial effect on parameters of basal lung function³. For those with asthma, diaphragmatic breathing exercises are thought to be the most important breathing method. It leads to the release of CO₂ from the lungs, reduces the load of breathing, and improves perfusion and ventilation⁴.

Peak flow metres track the rate at which air leaves your lungs during powerful exhalations. Reading from the meter can help you. This is called peak flow meter. Peak flow meter were used to assess before and after intervention of study⁵. The air volume that a person can exhale during a forced breath in t seconds is known as their forced expiratory volume, or FEV. Typically, it is expressed as FEV_t, with a subscript indicating the duration of the measurement in seconds.

The goal of this study was to determine whether the Buteyko and diaphragmatic breathing techniques are beneficial for treating asthma in patients.

METHODS

The study was conducted at outpatient department in JKKMMRF College of physiotherapy under supervision of concerned authority. A sample of 30 participants within the age group of 20 to 55 years with asthma

patients were randomly divided into 2 Groups. A total number of 30 participants were selected by random sampling method after due to consideration to inclusion and exclusion criteria. They were divided into 2 groups. Group A and Group B with 15 participants in each group. Group A received Buteyko Breathing technique; Group B received Diaphragmatic Breathing technique for a total duration of 60min per day for 2 weeks. The parameters used for this study were FEV1 and PEFR.

Inclusion Criteria: Age: 20to55 years SEX: Both (Male and Female), Persons diagnosed as mild asthmatic having Pulmonary Function Test done. Using moderate to high doses of medication for asthma. Asthmatic patients whose conditions are stable

Exclusion Criteria: Patients with hypertension greater than 180/120 mmHg, Pregnancy women, Arterial aneurysms, Hemorrhagic stroke, Brain tumor, Patients who changed the medication for asthma during the 2week run in period, Psychological disorders, Orthopaedic abnormality.

RESULT AND TABLES

Comparison of forced expiratory volume in first second score between group A and group B

Sl.no	FEV1	Mean	Mean difference	Standard deviation	Unpaired "t" value
1	Group A	1.32	0.54	0.05	10.57
2	Group B	0.78			

Table 1: Comparison of forced expiratory volume in first second score between group A and group B

The comparative mean values, mean difference, standard deviation, and unpaired 't' value between group A and group B on forced expiratory volume in first second score.

Procedure:

Group A

Buteyko Breathing technique for a session of 60 minutes per day for 2 weeks. The technique consists of 5 core components reduced breathing, nose breathing, coughing, voluntary hypoventilation and breathing exercise⁶.

Group B

Diaphragmatic Breathing Exercise for a session of 60 minutes per day for 2 weeks.

The patient is in gravity assisted position. The patient initiates the breathing pattern with the accessory muscles of inspiration slowly and deeply through the nose keeping the shoulders relaxed and upper chest quiet, allowing the abdomen to raise exhale through mouth⁷.

Progression is in a variety of positions (supine, sitting, and standing) & during activity (Walking and Climbing Stairs). On the 15th day, FEV1 and PEFR values were recorded in a graph.

The above table shows unpaired t-value of 10.57 was greater than the tabulated value which showed that there was statistically significant difference at 0.0001 level between Group A and Group B. The Group A mean was 1.32 and Group B mean was 0.78, and the mean difference of Group A & Group B was

0.54, which showed improvement in asthma symptoms, breathing pattern and breathing capacity of Group A patients with Asthma when compared to Group B. Therefore, the above analysis and interpretation is rejecting null hypothesis and accepting alternate Hypothesis.

Comparison of PEFR between group A and group B

The comparative mean values, mean difference, standard deviation, and unpaired ‘t’ value between group A and group B on PEFR.

PEFR	Mean	Mean difference	Standard deviation	Unpaired “t” value
Group A	137.33	56	4.06	13.78
Group B	81.33			

Table 2: The comparative mean values, mean difference, standard deviation, and unpaired ‘t’ value between group A and group B on PEFR.

The above table shows unpaired t-value of 13.78 was greater than the tabulated value which showed that there was statistically significant difference at 0.0001 level between Group A and Group B. The Group A mean was 137.33 and Group B mean was 81.33, and the mean difference of Group A & Group B was 56, which showed improvement in asthma symptoms, breathing pattern and breathing capacity of Group A patients with Asthma when compared to Group B.

FEV1 and the risk of asthma attacks over a long term follow-up. Based on the study, It was concluded that FEV1% predicted was significantly associated with risk of an asthma attack over the 3years following its measurement⁸.

DISCUSSION

The aim of the study was to compare the effects of Buteyko breathing technique and Diaphragmatic breathing technique for improving the quality of life in asthmatic patients. Barrett T Kitch, et al., conducted a study to determine the relationship between

This study was conducted to study the effects of Buteyko breathing exercise on the newly diagnosed asthmatic patients. Group A was given Buteyko Breathing Exercise and Group B was a control group which was on standard asthma treatment. It was observed that there was an overall subjective improvement of asthma symptoms among the interventional group at the end of 2 months (which was statistically significant) when compared to the control group. Also, there was an improvement in the pulmonary function in terms of peak expiratory flow rate in both the groups. The

results of this study support the effectiveness of Buteyko breathing exercise over the standard treatment in the newly diagnosed asthmatic patient^{9,10}.

The primary goal of asthma management is to achieve and maintain control of the disease in order to prevent exacerbations. This study was therefore aimed at comparing the effects of incentive Spirometry and Diaphragmatic Resistance Training on selected cardio-Pulmonary parameters in patients with asthma.

Our finding shows that the use of Incentive Spirometry and Diaphragmatic Resistance Training has beneficial effects in improving selected pulmonary parameters (FEV1, FVC, PEFR). However, the use of Diaphragmatic Resistance Training is clinically more beneficial and isthus recommended being a part of the intervention for patients with asthma^{11,12}.

In the analysis and interpretation of forced expiratory volume in first second score in group A group B: The unpaired t-value of 10.57 was greater than the tabulated value which showed that there was statistically significant difference at 0.0001 level between Group A and Group B.

In the analysis and interpretation of PEFR in group A group B: The unpaired t-value of 13.78 was greater than the tabulated value which showed that there was statistically significant difference at 0.0001 level between Group A and Group B.

Ethical clearance: Ethical clearance was obtained from the Institutional ethical committee, JKMMRF College of

Physiotherapy, Komarapalayam with reference No. IRB/MPT/C-502/24, dated 03/03/2023.

Conflicts of Interest: There was no personal or institutional conflict of interest for this study.

Fund for the study: This was a self funded study.

CONCLUSION

Based on this study, Buteyko breathing exercises reduced the asthma symptoms and helps in increasing the quality of life for asthma patients.

Based on the result, this study concludes that the Buteyko breathing therapy was more effective than Diaphragmatic Breathing therapy in asthmatic patients.

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