



**EFFECTIVENESS OF DIAPHRAGMATIC BREATHING
EXERCISE AND PURSED LIP BREATHING EXERCISE IN
REDUCING DYSPNEA IN PATIENTS WITH ACUTE BRONCHIAL
ASTHMA**

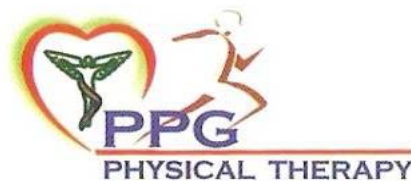
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THE TAMIL NADU DR. M. G. R. MEDICAL UNIVERSITY,
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Submitted by

Reg no: 27113222



P.P.G. COLLEGE OF PHYSIOTHERAPY

9/1, keeranatham road,

Saravanampatty,

Coimbatore-641035

www.ppgphysiotherapy.ac.in

P.P.G. COLLEGE OF PHYSIOTHERAPY

9/1, keeranatham Road,

Saravanampatti,

Coimbatore- 641035.

The Dissertation entitled

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Submitted by

Reg no: 27113222

Under the guidance of

Prof. C.K. MURALIDHARAN M.P.T (CARDIO), MIAP.,

Dissertation submitted to

THE TAMILNADU DR. M. G. R. MEDICAL UNIVERSITY,

CHENNAI-32.

Dissertation evaluated on -----

Internal Examiner

External Examiner

CERTIFICATE I

This is to certify that the dissertation work entitled “**EFFECTIVENESS OF DIAPHRAGMATIC BREATHING EXERCISE AND PURSED LIP BREATHING EXERCISE IN REDUCING DYSPNEA IN PATIENTS WITH ACUTE BRONCHIAL ASTHMA**”

was carried out by Reg. no. **27113222** P.P.G College of physiotherapy,
Coimbatore-35, affiliated to The Tamilnadu Dr. M.G.R medical university,
Chennai-32, under the guidance ,

C K MURALIDHRAN M P T (CARDIO) MIAP.,

Prof. K. RAJA SENTHIL M.P.T (Cardio-Resp), MIAP, PhD _____

Principal

CERTIFICATE II

This is to certify that the dissertation work entitled **EFFECTIVENESS OF
DIAPHRAGMATIC BREATHING EXERCISE AND PURSED LIP
BREATHING EXERCISE IN REDUCING DYSPNEA IN PATIENTS
WITH ACUTE BRONCHIAL ASTHMA**

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Chennai-32, under my guidance of
prof.C K MURALIDHRAN M P T (CARDIO) MIAP

Prof. C.K.MURALIDHARAN M.P.T (CARDIO), MIAP.,

Professor

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I Praise and thank GOD for his gracious showers of blessings upon me that has shaped me.

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ABSTRACT

OBJECTIVES

- To study the effect of pursed lip breathing exercise with bronchodilator in reducing dyspnea during acute asthma

STUDY DESIGN

Pre test and post test experimental study.

METHODOLOGY

The subjects are divided into two experimental groups and each group having 15 subjects

Fifteen subjects during acute asthma which consist of 8 males and 7 femals were trained with diaphragmatic breathing exercise with bronchodilator.

Fifteen subjects during acute asthma which consist of 8 males and 7 femals were trained with pursed lip breathing exercise with bronchodilator.

RESULTS

The mean value of post test scores shows that diaphragmatic and of diaphragmatic and of pursed lip breathing exercise group subjects shows that the pursed lip breathing group subjects improved more than the diaphragmatic group subjects

CONCLUSION

“There is significant reduction of dyspnea in acute asthmatic exacerbations along with bronchodilator using two breathing exercise training and in which pursed lip breathing training is effective in aspect of reduction of dyspnea than diaphragmatic breathing exercise

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Introduction

1.1. INTRODUCTION

Asthma is a disease of the respiratory system in which the airways constrict, become inflamed and are lined with excessive amounts of mucus, often in response to one or more 'triggers'. Such as exposure to environmental stimulant or cold air, exercise or emotional stress. The incidence of asthma is about 3% to 7% in adults. It is found more often in individuals under age 40. Asthma causes approximately 1000 deaths each year. The WHO estimate that there are between 15 and 20 million asthmatics in India. Globally asthma is responsible for around 1,80,000 deaths annually.
(Murray and Nadel 1999)

To facilitate the resolution of dyspnea physiotherapy measures are done. The measures to resolve dyspnea includes relaxation positions, oxygen therapy, bronchodilators, **IPPB** and breathing exercises

Physical therapy strategies such as diaphragmatic breathing exercise, pursed lip breathing exercise along with bronchodilators relieves bronchospasm, improves ventilation, oxygenation, reduce the work breathing and improve breathing pattern and breathing control.**(Nancy Humberstone and Jan Stephen; et. al. June 2006)**

The main therapeutic outcomes of these breathing exercise are to alleviate dyspnea and to increase tolerance. The physiological outcomes are to increase alveolar ventilation and reduce the work of breathing.

The Potential outcomes of these breathing exercise are to eliminate the accessory muscle activity, reduce respiratory rate, increase the peak flow, increase arterial oxygen tension and decrease carbon dioxide tension.

1.2. NEED OF THE STUDY

The study of acute asthma as clinical entity began with the observation that dyspnea was one of the major consequences of acute asthma which may last for hours and lead to status asthmaticus.

But hardly studies are available to prove the efficacy of pursed lip breathing and diaphragmatic breathing along with bronchodilators in rehabilitation of patients during acute asthma

So the main need for the study is to compare the effect of pursed lip breathing and diaphragmatic breathing along with the use of bronchodilator in reducing dyspnea in patients with asthma.

1.3. OPERATIONAL DEFINITIONS

ASTHMA

Asthma is a clinical syndrome characterized by airway hyperactivity to various external and internal stimuli and manifested as recurrent episodes of intermittent reversible airway obstruction.

DIAPHRAGMATIC BREATHING

Gosselink et.al described diaphragmatic breathing as “facilitating outward motion of the abdominal wall while reducing upper ribcage motion during inspiration”

PURSEDLIPBREATHING

Failing described as “usually the easiest breathing technique to learn and it is often employed instinctively by those who benefit from its use.” Patients inhale through the nose over several seconds with the mouth closed and then exhale slowly over 4 to 6 seconds through pursed lips held in a whistling (or) kissing position.

DYSPNEA

The American Thoracic Society defines dyspnea as a term used to characterize a subjective experience of breathing discomfort that consists of qualitatively distinct sensations that vary in intensity.

1.4. AIM OF THE STUDY

The aim of the study is to compare the effect of pursed lip breathing and diaphragmatic breathing exercise in reducing dyspnea with bronchodilator during acute asthma.

1.5. OBJECTIVES OF THE STUDY

- To study the effect of pursed lip breathing exercise with bronchodilator in reducing dyspnea during acute asthma
- To study the effect of diaphragmatic breathing exercise with bronchodilator in reducing dyspnea during acute asthma
- To compare the effect of pursed lip breathing with bronchodilator versus diaphragmatic breathing exercise with bronchodilator in reducing dyspnea during acute asthma

1.6. HYPOTHESIS OF THE STUDY

Null Hypothesis

1. There exists no significant effect of diaphragmatic breathing with bronchodilator in reducing reducing dyspnea during acute asthma.
2. There exists no significant effect of pursed lip breathing exercise with bronchodilator in reducing reducing dyspnea during acute asthma.
3. There exists no significant difference between diaphragmatic breathing with bronchodilator and pursed lip breathing with bronchodilator in reducing reducing dyspnea during acute asthma.

Alternate Hypothesis

1. There exists no significant effect of diaphragmatic breathing exercises with bronchodilator in reducing reducing dyspnea during acute asthma.
2. There exists no significant effect of pursed lip breathing exercise with bronchodilator in reducing reducing dyspnea during acute asthma.
3. There exists no significant difference between diaphragmatic breathing with bronchodilator and pursed lip breathing with bronchodilator in reducing reducing dyspnea during acute asthma.

2. LITERATURE REVIEW

Jonathan Howite; et. al. (March 2012)

Asthma is a chronic disease of the lung's airways in which the airways are inflamed which leads to airway narrowing and difficulty breathing which can improve with treatment. COPD stands for chronic obstructive pulmonary disease. Simply this means chronic damage to the lungs usually from smoking that can pass a myriad of damage to the lung which we collectively call COPD.

Ries; et.al. (June 2010)

Although COPD and asthma have similar characteristics such as signs of coughing and wheezing they are two distinct conditions. Asthma develops during childhood or adolescence. COPD most often develops in smokers.

Scherer YK; et.al. (May 2010)

Exacerbations in asthma – characterized by wheezing, shortness of breath, chest tightness cough. Exacerbations in COPD are commonly caused by respiratory tract infections.

Francis J Braj Brannon; et.al. (November 2004)

Asthma patients have near normal lung function and are symptom free between exacerbations. COPD patients rarely experience a day without symptoms

Eaton, CB; et.al (April 2003)

Dyspnea is the clinical term used for describing shortness of breath or breathlessness. **The American Thoracic Society** defines dyspnea as a term used to characterize a subjective experience of breathing discomfort that consists of qualitatively distinct sensations that vary in intensity. Acute dyspnea is common in acute asthma. In addition to limiting physical and social functioning the sensation of dyspnea is often accompanied by fear and anxiety. In some may be perceived as life threatening.

P Weiner; et. al. (June 2004)

In asthma respiratory rate is elevated and peak expiratory then is reduced (amount in litres per minute). The peak expiratory flow rate measures how fast a person can exhale air. It is one of the tests that measure the function of airway in asthma.

O’Driscol BR, Taylor RJ; et. al. (June 2004)

Double blind trial of nebulised bronchodilator treatment was done for acute asthmatic patients. Peak flow rate was below 140 liters per minute before treatment. In these patients the immediate PEFER response to nebulised salbutamol was better.

Lonuw SJ, Goldin JG; et. al (May 2000)

The efficacy of mobilized ipratropium bromide in patients with acute asthma were a rapid increase in peak expiratory flow rate, forced expiratory volume in 1 second and forced vital capacity.

DD Stret man, V Bhatt – metha; e. al (April 2003)

The acute exacerbations of asthma are challenging to manage. Beta (2) -agonists, ipratropium and corticosteroids remain the most useful therapeutic agents for acute asthma exacerbations.

Balady, Lareau et. al. (January 2000)

Exercise training is an effective method of relieving dyspnea in patients with chronic respiratory disease.

Stulbarg Adams et. al. (August 2000)

Exercise training reduces anxiety and improves self – confidence and desensitizes the intensity of dyspnea from repeated controlled exposure to stimulus.

Olden berg et. al. (July 1999)

Exercise also mucociliary transport in patients with asthma exercise increase lactate threshold and thereby reduces the early fatigability

Gosselink ; et. al (November 2001)

Diaphragmatic breathing is described as facilitating outward motion of the abdominal wall while reducing upper rib cage motion during inspiration. Diaphragmatic breathing increased paradoxical rib cage motions and no change in VO₂. Diaphragmatic breathing exercise are traditionally performed to increase ventilation and improve oxygenation and thus alleviated dyspnea, reduce the work of breathing.

Brager M, Mastsnoy ; et. al. (October 2002)

Diaphragmatic breathing exercise has beneficial effects is asthma. It minimizes breathlessness and minimizes the action of accessory muscles which assist in inspiration.

Girodo M Ekstrand KA; et. al. (August 1998)

Deep diaphragmatic training in asthmatic adults resulted in significant reductions in medications use and in the intensity of asthmatic symptoms.

Vitacca M, Clini E; et. al (March 2000)

The impact of deep diaphragmatic breathing in dyspnea for patients having acute exacerbation was improved significantly and inspiratory muscle effort decreased.

Faling; et. al (August 2001)

Faling described pursed lip breathing as ‘usually the easiest breathing technique to learn’. This is done with or without contraction of abdominal muscles. He contended the relief of dyspnea is almost immediate after starting to use the technique.

Levenson CR; et. al. (March 2003)

Pursed lip breathing has been reported to decrease dyspnea and therefore may improve exercise tolerance and reduce limitations in activities of daily living.

Muller; et. al. (December 1999)

Pursed lip breathing relieves the feeling of breathlessness and the relief is probably due to changes in mechanical function of the respiratory system and not alteration in gas exchange for the metabolic work of breathing.

Vander Schans CP; et. al. (August 1997)

Dyspnea seems to be related to increase activity of the respiratory muscles. Pursed lip breathing this muscle activity and also resulted in a significant increase of Functional residual capacity and tidal volume during airway obstruction.

Truesdells; et. al. (September 2001)

Acute episodes of shortness of breath cannot be relieved completely with the use of bronchodilators. Implementation of pursed lip breathing is effective during episodes of acute dyspnea.

Garrod R, Dallimore K; et. al. (April 1999)

The study of effects of pursed lip breathing on walking distance in asthmatic patients showed good response with pursed lip breathing, reduction of breathlessness and return of patient to pre exercise breathlessness

Shaphija J.de Marchie ; et.al. (May 2004)

Pursed lip breathing can have a variable effect on dyspnea when performed volitionally during exercise by patients with asthma.

Tiep BL, Burns M; et. al. (Nov 1998)

Pursed lip breathing is often used in the management of patients with asthma. Pursed lip breathing relieves dyspnea as well as improves arterial oxygen saturation (Sao₂) and Co₂

Donado JR, Hill NS; et. al. (July 2002)

Physical therapy measures may be useful in patients with copious sputum production, and pursed lip and diaphragmatic breathing exercise may reduce dyspnea and lend a sense of control to patients with severe flow limitation

Gigliotti F, Romagnoli I; et. al. (June 2005)

Pursed lip breathing and diaphragmatic breathing are breathing retraining strategies employed by asthmatic patients in order to relieve and control dyspnea.

Sudo E; et. al. (January 2000)

The pulmonary rehabilitation is effective in patients with acute asthma. The pulmonary rehabilitation program consisted of pursed lip breathing diaphragmatic breathing training. Dyspnea was decreased; the results suggest pulmonary rehabilitation might improve exercise tolerance in patients with asthma.

Jones; et. al. (September 1999)

Pursed lip breathing and diaphragmatic breathing reduces respiratory rate and PEFER, also will decrease the rate of work of breathing.

Gail Dechman; et. al. (February 2001)

Evidence suggests that pursed lip breathing slows respiratory rate and PEFER devreasing the resistance pressure drop across the airway therefore reduces airway narrowing during expiration. Diaphragmatic breathing simply slows respiratory rate evidence supports the use of pursed lip breathing exercise for improving the breathing of people.

Gosselink RA, Wagnnear RC; et. al. (August 2005)

Breathing exercise improves ventilation reduces dyspnea and normalize pattern of breathing.

Roberto Bianchi; et. al. (August 2003)

Brathing training is likely to contribute to relief of exertion of dyspnea

Weiner P, Magadle K; et. al. (July 1998)

Dyspnea is a common complaint during daily activities in patients with acute asthma. In these patients following periods of therapy with bronchodilators with inspiratory muscle training exercise got benefited. The FEV1 and PEFER were moderately increased.

Carolyn Kisner; et. al. (April 1997)

Patients with acute asthma may suffer from periodic attacks of dyspnea shortness of breath with physical exertion. Prevention of shortness of breath attacks with controlled breathing by pacing activities.

N.Ambrosino,MD; et. al. (May 2000)

The physical reconditioning brought on by disbling dyspnea can lead to marked reduction in the abilty of patient with asthma.

Materials of Methodology

3. MATERIALS OF METHODOLOGY

3.1. MATERIALS

- Couch
- Pillows
- Sheets
- Saline Solution
- Wrights Peak Flow Meter

3.2. METHODOLOGY

3.2.1. Study Design

The study design is a pre test and post test experimental study design

3.2.2. Sample Population

30 Subjects

3.2.3. Sample Selection

The sample is selected using Non – Probability purposive sampling technique.

3.2.4. Selection Criteria

3.2.4.1 Inclusion Criteria

The subjects to be studied are

- Acute Asthmatic patients
- Both Male and Female Subjects
- Age 20 to 40 Years

3.2.4.Exclusion Criteria

The subjects who were excluded are

- Status Asthmaticus
- Chronic Asthma
- Bronchopneumonia
- Acute Infection of Lungs
- Patients with Cardiac Diseases
- Other Pulmonary Disease
- Restrictive Lung Diseases

3.2.5. Study Method

The subjects are divided into two experimental groups and each group having 15 subjects.

Experimental group I

Fifteen subjects during acute asthma which consist of 8 males and 7 femals were trained with disphragmatic breathing eercise with bronchodilator.

Experimental group II

Fifteen subjects during acute asthma which consist of 8 males and 7 femals were trained with pursed lip breathing exercise with bronchodilator.

3.2.6. Study setting

Ashwin hospital

Kongunadu hospitals.

3.2.7. Parameters

Peak expiratory flow rate is measured with peak flow meter

3.2.8. Treatment Technique

Diaphragmatic breathing training

Position: Semi – upright position (half lying)

Instruction

First teach the subject how to breathe by using diaphragm. The therapist hand is placed over the rectus abdomius just below the anterior costal margin, the subject to breathe in slowly, deeply through the nose then ask the subject slowly let all the air out through by controlled expiration.

Pursed Lip Breathing Training

Position: Semi – upright position (half lying)

Instruction

First instruct the subject to avoid abdominal contraction and to relax while expiring, therapist hand is placed over the subject's abdomen to detect any contraction. The subject is asked to breathe in slowly and deeply, then loosely purse the lip and exhale.

3.2.9. Procedure

Proper instruction were given and procedures were demonstrated to all the subjects. 30 subjects administered with bronchodilator during an acute asthmatic attack was selected pre test scores of peak expiratory flow rate were recorded before breathing exercise. Experimental group I subjects were given diaphragmatic breathing, group II were given pursed lip breathing exercises.

Subjects were made to do two sets of five repetitions with two minute rest given between the sessions. At the end of two sessions, peak expiratory flow rate were recorded as post test scores are tabulated in the tabular column.

3.2.10. Statistical Tools

The study was conducted in a pre – test, post – test study design. To analyse these variable student t –test was used.

The t – values are calculated using paired t – test formula for intra group comparison.

$$t = \frac{\bar{d}\sqrt{n}}{S}$$

$$S = \sqrt{\frac{\sum d^2 - (d)^2 \times n}{N - 1}}$$

\bar{d} - Mean of the sample

S – Standard deviation

N – Number of subjects

The inter group comparison is assessed by using independent ‘t’ test

$$T = \frac{\bar{X}_1 - \bar{X}_2}{S} \sqrt{\frac{n_1 n_2}{n_1 + n_2}}$$

\bar{X}_1 – mean of the first sample

\bar{X}_2 – mean of the second sample

\bar{n}_1 – Number of subjects in group I

\bar{n}_2 – Number of subjects in group II

Data Presentation

4. DATA PRESENTATION

EXPERIMENTAL GROUP I

BRONCHODILATOR WITH DIAPHRAGMATIC BREATHING

SL.NO	PEFER in liters / Minute	
	Pre Test	Post Test
1	5.6	6.5
2	1.1	1.9
3	4.7	5.3
4	3.9	5.1
5	3.5	4.8
6	2.3	4.0
7	4.1	5.7
8	5.8	7.3
9	3.7	4.4
10	3.3	4.4
11	3.2	4.7
12	2.5	3.6
13	2.9	4.1
14	1.6	3.9
15	3.9	5.1

EXPERIMENTAL GROUP II**BRONCHODILATOR WITH PURSED LIP BREATHING**

SL.NO	PEFER in liters / Minute	
	Pre Test	Post Test
1	3.6	6.1
2	1.9	5.4
3	1.7	4.3
4	2.2	5.8
5	4.5	7.2
6	3.1	5.2
7	2.5	4.8
8	3.9	6.9
9	4.1	5.8
10	1.3	5.2
11	3.1	4.0
12	3.6	6.2
13	4.1	6.1
14	1.3	5.2
15	3.7	6.9

5. DATA ANALYSIS AND INTERPRETATION

TABULATION:

TABLE – 1

Pre test values of experimental group – I and II (Diaphragmatic breathing and pursed lip breathing exercise)

Groups	Pre - Test	
	Exp – Group – I	Exp – Group - II
Mean Value	3.46	2.97
Independent ‘t’ Test	0.22	
P – Value and Significances	P Value < 0.05 Significant	

The calculated independent ‘t’ value for experimental group – I and II is 0.22. The critical value for 28 degrees of freedom at 5 % level of Significance is 1.701. Since the calculated value is less than the table value exists no significant difference between the pre test values of experimental group I and II.

Table – II

Pre test and post test values for experimental group – I (Diaphragmatic breathing exercise)

Groups	experimental Group – I	
	Pre test	post test
Mean Value	3.46	4.72
't' Test	9.39	
P – Value and Significances	P Value < 0.05 Significant	

The calculated 't' value is 9.39 and the table value for 14 degrees of freedom at 5 % level of Significance is 1.761. Since the calculated value is greater than the table value, the alternate hypothesis is accepted which states that there is significant difference exists between pre and post test values of experimental group - I in terms of reducing dyspnea.

**Comparison of mean values of Pre – test and Post – test PEFR
of Experimental group I**

Table II

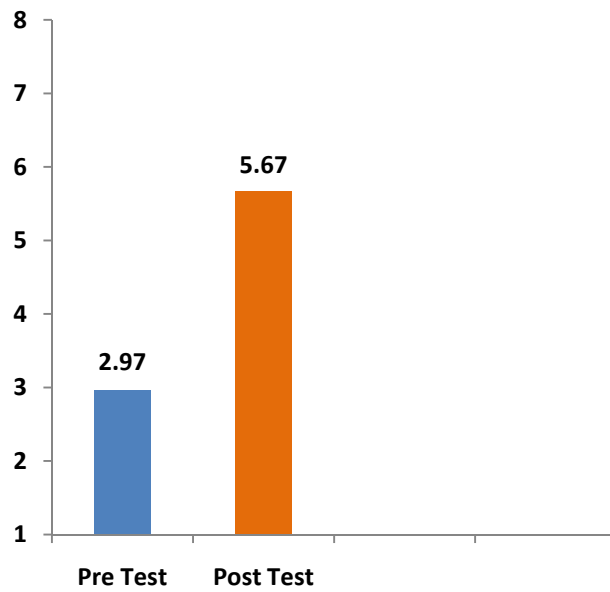


Table – III

Pre test and post test values for experimental group – II (pursed lip breathing)

Groups	Experimental Group – I	
	Pre test	post test
Mean Value	3.46	4.72
't' Test	9.39	
P – Value and Significances	P Value < 0.05 Significant	

The calculated 't' value is 9.39 and the table value for 14 degrees of freedom at 5 % level of Significance is 1.761. Since the calculated value is greater than the table value, the alternate hypothesis is accepted which states that there is significant difference exists between pre and post test values of experimental group - I in terms of reducing dyspnea.

**Comparison of mean values of Pre – test and Post – test PEFR
of Experimental group II**

Table - III

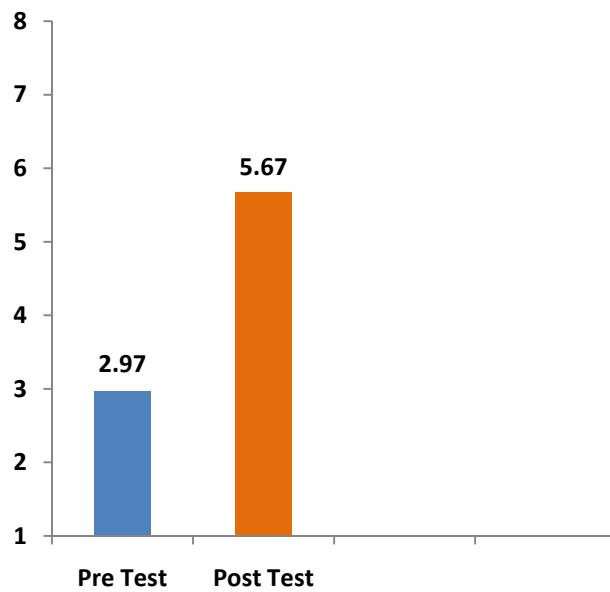


Table – IV

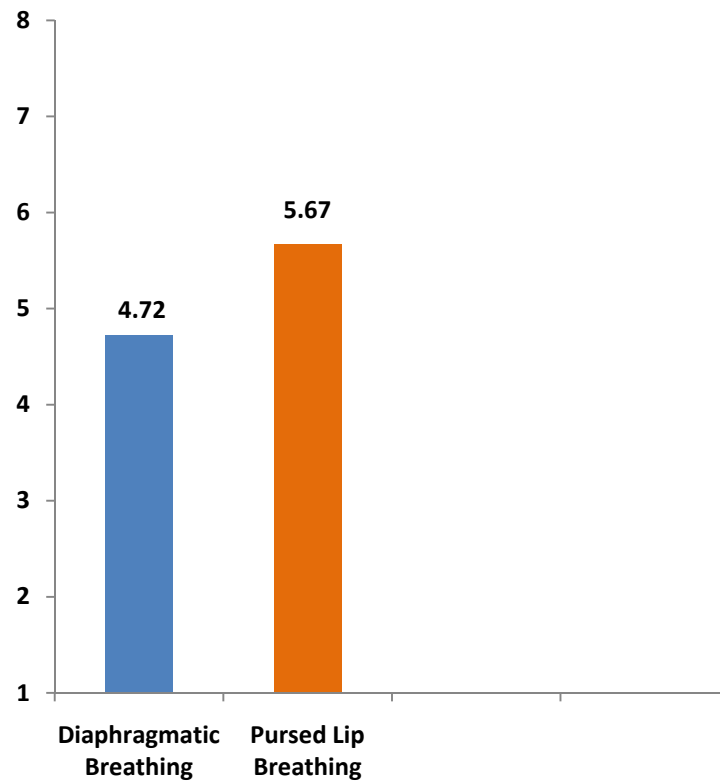
Comparison the Post – test values of experimental group – II (Diaphragmatic breathing and pursed ;ip breathing)

Groups	Post Test	
	Exp – Group - I	Exp – Group - II
Mean Value	4.72	5.67
Independent ‘t’ Test	2.46	
P – Value and Significances	P Value < 0.05 Significant	

The calculated Independent‘t’ value for of experimental group – I and II is 2.46. The critical value for 28 degrees of freedom at 5% level of significances is 1.761. Since the calculated value is more than the table value there exists a significant difference between the post test values of experimental group I and II.

Comparison of mean values of Post test PEFR of Experimental group I and Experimental group I

Table IV



Results

6. RESULTS

The mean value of pre test and post test scores shows that diaphragmatic breathing exercise group subjects significantly improved after the intervention.

The mean value of pre test and post test scores shows that pursed lip breathing group subjects significantly improved after the intervention

The paired 't' test shows that there is significant difference existing between pre test and post test scores of diaphragmatic breathing exercise group subjects .

The paired 't' test shows that there is significant difference existing between pre test and post test scores of pursed lip breathing exercise group subjects.

The independent 't' test shows that that there is significant difference existing between and post test scores of diaphragmatic and of pursed lip breathing exercise group subjects.

The mean value of post test scores shows that diaphragmatic and of diaphragmatic and of pursed lip breathing exercise group subjects shows that the pursed lip breathing group subjects improved more than the diaphragmatic group subjects.

Discussion

7. Discussion

In the recent Global initiative for asthma (GINA) guidelines asthma is defined as follows. A chronic inflammatory disorder of airways in which many cells and cellular elements play a role. The chronic inflammation causes are associated increase in airway hyper responsiveness that leads to recurrent episodes of breathlessness, wheezing, chest tightness and coughing particularly at night or in the early morning.

Asthma is associated with an increase in airway resistance. The first intervention of asthma is prevention. The goal of treatment is to minimize exacerbation. The use of short and long acting bronchodilator are one of the defenses in controlling asthma. Establishment of a routine exercise program is also important in treatment of asthma. People with asthmatic attack have a positive response to exercise with improved oxygen consumption and decrease in blood lactate.

Analyses of results have shown that the dyspnea level was reduced after specified exercises in both groups. In experimental group I the mean PEFr improved from 3.46 to 4.72 after intervention. Similarly in experimental group II the mean PEFr improved from 2.97 to 5.67. When comparing the results of both groups, the post test mean value of experimental group I was 4.72 and that of experimental group II was 5.67. This shows that the subjects who were trained with pursed lip breathing along with bronchodilator had improved well than with patients who were trained with diaphragmatic breathing along with bronchodilator.

It is proved that pursed lip breathing exercise along with bronchodilator helps effectively in reducing dyspnea than diaphragmatic breathing exercise along with bronchodilator clinically and statistically.

The 't' value (independent and paired) for parameters of dyspnea has been quite significant and $P= 0.05$ and the 't' value is higher than the table value.

Diaphragmatic breathing will help to relieve dyspnea. Diaphragmatic breathing exercise has also been administered to eliminate accessory muscle activity, alleviate dyspnea and reduce the work of breathing.

Pursed lip breathing slows the respiratory and peak expiratory flow rate. Pursed lip breathing has been reported to decrease dyspnea and therefore may improve exercise tolerance and reduce limitations in activities of daily living. Unlike dyspnea relief, pursed lip breathing also decreases the work of breathing. Use of diaphragmatic breathing and pursed lip breathing reveals that the use of pursed lip breathing appears to be an effective way to decrease dyspnea and improve gas exchange in people with moderate to severe asthma.

Summary of Conclusion

SUMMARY OF CONCLUSION

In an effort to compare the effects of diaphragmatic breathing and pursed lip breathing in reducing dyspnea with acute asthma, thirty asthmatic subjects were selected under purposive sampling technique and randomly assigned into two groups. In addition to bronchodilators group I receiving diaphragmatic breathing exercise and group II receiving pursed lip breathing exercise.

The study was pre – test and post – test experimental design. The outcome of the statistical analysis and literature review reveals that two breathing exercise reduces breathlessness and improves health status.

Hence based on the outcome of the paired ‘t’ test and independent ‘t’ test and their values are higher than the table value at $P=0.05$. Since the calculated value is more than the table value there exists a significant difference between the two experimental groups. Hence it is concluded that the null hypothesis is excluded and thereby the experimental hypothesis is accepted. Thus the is stated in the light of experimental hypothesis which could be

“There is significant reduction of dyspnea in acute asthmatic exacerbations along with bronchodilator using two breathing exercise training and in which pursed lip breathing training is effective in aspect of reduction of dyspnea than diaphragmatic breathing exercise”

Limitations and Suggestions

9. LIMITATIONS AND SUGGESTIONS

- Since the study has been done with smaller number of subjects further studies be conducted with a large sample.
- Since the study was done with subjects on acute asthma further studies should be conducted with subjects on other pulmonary diseases.
- This study was done with diaphragmatic and pursed lip breathing alone further studies should be conducted with other types of physiotherapies like inspiratory muscle training exercise and control of breathing
- This study measures one time performance and pursed lip breathing results were interpreted. Further study can be attempted to know the follow up for long term benefits.
- Since the study was done under single geographical condition further studies should be conducted in different geographical conditions.
- This study was done with the age group between 20 – 40 years. Further studies should be conducted also in children.

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Appendix

ASSESSMENT FORM

NAME :

AGE / SEX :

ADDRESS :

OCCUPATION :

DIAGNOSIS :

MODE OF EXERCISE – Diaphragmatic Breathing / Pursed Lip breathing exercise

SL.NO	PRE TEST SCORE	POST TEST SCORE