



**EFFECT OF PURSED LIP BREATHING ON
RESPIRATORY PARAMETERS AMONG
ASTHMATIC PATIENTS SELECTED HOSPITALS
AND AREAS OF NAVI MUMBAI**

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ABSTRACT

Background:In sight the fact that asthma is a condition that affects the human respiratory system, it is possible to classify this condition as belonging to a category of immunological illnesses that target the respiratory system. Exercises involving pursed lip breathing (PLB) are one of the non-pharmacological treatments that can be used for asthma patients. Self-care management techniques will improve the respiratory function and improve the quality of life. Methodology: Quasi-experimental one Group pre-test post-test research design using quantitative research approach is used in this study. Non probability purposive sampling technique was followed and sample size was 15. Asthmatic adults were selected from OPD of the hospitals and clinics. Pursed lip breathing was followed by samples for four weeks. **Result:**With a pre-test mean 11.13 and SD 1.884, post-test mean 6.4 and SD 2.70, the calculated p value was <0.00001 ($P < 0.05$), it shows significant Effectiveness in respiratory parameters of the asthmatic patients.

Conclusion: The introduction of a self-care management such as PLB technique can be highly beneficial in improving respiratory parameters and controlling asthma and thereby reducing readmissions. It is essential for healthcare professionals to initiate the plan to ensure patients gain confidence and competence in utilizing the plan. Empowering patients with the right knowledge and self-care management practices will help them take charge of their health and reduce the burden of healthcare costs. Therefore, it is recommended that healthcare professionals prioritize the development and implementation of self-care management techniques such as PLB to improve patient outcomes.

Key Words: Effectiveness, Pursed lip breathing (PLB), Respiratory parameters, Asthmatic patients

INTRODUCTION

People of all ages are impacted by the chronic respiratory disease asthma, which is a severe issue for global health. Asthma was the second-leading cause of mortality among chronic respiratory disorders in 2017, with an estimated 3.33 percent global prevalence. In 2017, there were 457.01 thousand asthma-related deaths. ¹

According to the most current Global Burden of Disease report (GBD, 1990-2019), 34.3 million Indians are predicted to have asthma, which represents 13.09% of the global burden. In addition, it stated that asthma was to

blame for 13.2 thousand fatalities in India. In Indians, asthma accounted for 27.9% of DALYs (disability-adjusted life years). Overall, compared to the worldwide burden of asthma, India has three times the mortality rate and more than double the DALYs.² There is a lot of evidence that the prevalence is rising around the world, and the possible reasons for the rise or for the different prevalence rates in different countries are different. But most people think that pollution, allergens, the western way of life, and environmental tobacco smoke are the main causes.³

Asthma is a heterogeneous disease usually characterised by chronic airway inflammation. It is defined by a history of respiratory symptoms such as wheezing, shortness of breath, chest tightness, and cough that vary over time and in intensity, together with variable expiratory airflow limitation.¹

Asthma is a common lung condition that occasionally makes breathing challenging. It can affect adults as well as children, but it usually first manifests in childhood. Despite the fact that there is now no known cure, medicines can assist manage the symptoms. Patients are able to live happy lives if they have the right treatment and supervision. Asthma is a condition where the airways that carry air to and from the lungs enlarge and become restricted.⁴

Airway obstruction is the defining feature of the reversible condition known as asthma, which can recur for a variety of reasons. A bronchial asthma attack often manifests as recurrent episodes of paroxysmal expiratory dyspnea accompanied by wheezing and coughing brought on by bronchial mucosal inflammation, bronchial muscle spasm, and purulent secretion production. According to WHO, there are currently 235 million asthmatics in the world. Every year, an estimated 80% of deaths are related to asthma episodes, with low-moderate economies having the highest risk.⁵ Some people with asthma experience symptoms that diminish their ability to work and enjoy life.

The primary objective of asthma treatment is to reduce the impact of the disease on the patient's day-to-day activities and to bring the patient's asthma symptoms under control. Coughing, wheezing sounds during an attack, shortness of breath, and an uneasy feeling in the chest, and difficulties sleeping as a result of the coughing are some of the typical asthma symptoms that occur. It is difficult to begin treatment as soon as possible in order to reduce the risk of future lung tissue damage. Both pharmacological and nonpharmacological treatment play a significant management role in the condition.⁶

Exercises to improve breathing are frequently suggested as a supplementary asthma treatment. Little has been systematically documented on the advantages of these strategies for asthma patients, according to a review of the published literature. In chronic obstructive disorders, belly breathing has been shown to have negative effects, and the physiological basis for it in asthma is unclear. Although nasal breathing and pursed-lip breathing have positive effects, clinical data is lacking despite theoretical study and empirical observations to the contrary. Simple breathing pattern changes don't have much of an impact. There is some evidence that exercising the muscles of inspiration and practising hypoventilation can help people take less medications, particularly β -adrenergic inhalers. More study is required to understand the psychological and physiological bases of various breathing techniques used by people with asthma, the differences between patient subgroups, and the benefits of training in day-to-day living.⁷

Pursed-lip breathing is a way to breathe that slows down and plans your breaths to make them as effective as possible. Patients with lung problems need to have more control over their breathing, which pursed lip breathing makes possible. When the air is exhaled through the pursed lip, it improves the way your lungs work and makes it

*EFFECT OF PURSED LIP BREATHING ON RESPIRATORY PARAMETERS AMONG ASTHMATIC PATIENTS
SELECTED HOSPITALS AND AREAS OF NAVI MUMBAI*

easier to breathe. This is very helpful for people with lung diseases that make it hard to breathe. Interstitial lung diseases, like pulmonary fibrosis (PF), block the airways, like asthma, and limited lung diseases, like respiratory fibrosis (ILD), make it hard to breathe. ⁸

Objective:

1. To assess the respiratory parameters among asthmatic patients before and after pursed lip breathing
2. To determine the effectiveness of pursed lip breathing on respiratory parameters among asthmatic patients
3. To determine the association of pre interventional scores of respiratory parameters with selected demographic variables

Hypothesis stated are-

H₀₁: There is no difference between Pre interventional & Post interventional respiratory parameters among asthmatic patients doing pursed lip breathing at 0.05 level of significance

H₀₂: There is no association between pre interventional scores of respiratory parameters with selected demographic variables at 0.05 level of significance

Methodology

Quantitative Research Approach was used with a Quasi-experimental one group pre-test post-test research Design. The study has conducted at selected hospital OPD, Clinics of Navi Mumbai. The population for the proposed study was the adults suffering from asthma. The study has selected OPD patients between 18 to 55 years old who suffer from asthma and use repulses, inhalers, or nebulizations whenever required. The selection also considers patients who know Marathi, Hindi, or English. Study did not include adults who were taking oral or injectable corticosteroids or bronchodilators and who had a severe major illness. For the present study sample size was 15 and non-probability purposive sampling technique was used to select the samples.

Result:

Table No 1: Socioeconomic characteristics of asthmatic patients

n=15

Sr.No	Demographic Variables	Frequency	Percentage
Age in Years			
a	18-25 years	1	6%
b	26-35 years	7	47%
c	36-45 years	4	27%
d	46-55 years	3	20%
Gender			
a	Male	8	53%
b	Female	7	47%
Educational status			

*EFFECT OF PURSED LIP BREATHING ON RESPIRATORY PARAMETERS AMONG ASTHMATIC PATIENTS
SELECTED HOSPITALS AND AREAS OF NAVI MUMBAI*

a	Profession or Honours	0	0%
b	Graduate or post graduate	2	13%
c	Intermediate or post high school diploma	5	33%
d	High school certificate	4	27%
e	Middle school certificate	1	7%
f	Primary school certificate	1	7%
g	Illiterate	2	13%
Occupational status			
a	Sedentary worker	5	33%
b	Moderate worker	6	40%
c	Heavy worker	3	20%
d	Unemployed	1	7%
Residence			
a	Urban	8	53%
b	Urban Slums	7	47%
Monthly family income (In rupees)			
a	≥32050	1	7%
b	16020 – 32049	3	20%
c	12020 – 16019	4	26%
d	8010– 12019	5	33%
e	4810– 8009	1	7%
f	1601– 4809	1	7%
g	≤ 1600	0	0%
Size of the residence			
a	200 Square feet	3	20%
b	201 - 400 Square feet	6	40%
c	401 – 600 square feet	4	27%
d	More than 601 square feet	2	13%
No of Family members residing in the house			
a	Upto 2	3	20%
b	3-5	10	67%
c	6-8	2	13%
d	More than 8	0	0%

The data represented in Table No. 1 represents that majority of 7(47%) belonged to 26-35 years, 8(53%) were males, 5(33%) had Intermediate or post high school diploma and 6 (37%) were moderate worker.

Majority of 8 (53%) from urban area and 5(33%) had monthly family income between Rs.8010-12019. The samples 6(40%) had used the residence size of 201-400 square feet and 10(67%) have 3-5 members.staying with them

Table No 2: Clinical characteristics of asthmatic patients

n=15

Sr. No	Clinical characteristics	Group-1	
		Frequency	Percentage
Suffering from asthma since ___ yrs.			
a	< 5	6	40%
b	6-10	3	20%
c	11-15	2	13%
d	More than 15	4	27%
No. of hospital admissions due to asthmatic attack in previous year			
a	No admission	4	27%
b	1-3	5	33%
c	4-6	2	13%
d	7-9	3	20%
e	More than 10	1	7%
Do you take any medicine for asthma			
a	No medicines	3	20%
b	Use of nebulisation(repulse)	4	27%
c	Use of revolizer (dry powder)	6	40%
d	Use of spray pump	2	13%

The above **Table No.2** states that 6(40%) had asthma from <5 year. Majority of 5(33%) had 1-3 times of admission in a year due to asthma attacks and 6(40%) use of revolizer (dry powder).

Table no 3: Item wise analysis of respiratory status among asthmatic patients before and after pursed lip breathing.

n=15

Respiratory Parameters	Pre-intervention		Post intervention 1		Post intervention 2		Post intervention 3		Post intervention 4	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Respiratory rate										
16-22/min	1	7	2	14	2	13	3	20	5	33
12-15/ min	2	13	3	20	4	27	6	40	7	47
23-28/min	5	33	5	33	5	33	5	33	2	13
>28 /min	7	47	5	33	4	27	1	7	1	7
Respiratory rhythm										
Regular	4	27	5	33	7	47	9	60	9	60
Irregular	11	73	10	67	8	53	6	40	6	40

*EFFECT OF PURSED LIP BREATHING ON RESPIRATORY PARAMETERS AMONG ASTHMATIC PATIENTS
SELECTED HOSPITALS AND AREAS OF NAVI MUMBAI*

Respiratory depth										
Normal	3	20	4	27	6	40	9	60	9	60
Deep	5	33	5	33	4	27	3	20	3	20
Shallow	7	47	6	40	5	33	3	20	3	20
Respiratory breath sounds										
Normal	1	7	2	13	3	20	5	33	6	40
Rales/ronchi	3	20	3	20	4	26.66	4	27	4	27
Wheezing	5	33	4	27	4	26.66	4	27	4	27
High pitched wheezing	6	40	6	40	4	26.66	2	13	1	6

In Table no. 3 depicts that preintervention 7(47%) had >28 /min respiratory rate reduced to 1 (7%) in postintervention phase 4. Regular rhythm is improved from 2 (47%) to 1 (7%) Normal respiration is improved from 3 (20%) to 9 (60%) and high pitched wheezing reduced to 1(6%) from 6 (40%)

Table no 4: Overall respiratory status among asthmatic patients before and after pursed lip breathing.

n=15

Respiratory Parameters	Pre- Intervention		Post Intervention 1		Post Intervention 2		Post Intervention 3		Post Intervention 4	
	N	%	N	%	N	%	N	%	N	%
Mildly compromised	1	7	3	20	4	27	7	47	10	67
Moderately compromised	3	20	5	33	6	40	6	40	3	20
Severely compromised	11	73	7	47	5	33	2	13	2	13

The above **Table no. 4.** Above findings suggest that mildly compromised status is improved from 1(7%) to 10 (67%) and 11 (73%) participants severely compromised status is lowered to 2 (13%) in post intervention 4.

Table no 5: Item wise analysis of respiratory status by PEFR among asthmatic patients before and after pursed lip breathing.

n=15

PEFR Parameters	Pre- Intervention		Post intervention 1		Post intervention 2		Post intervention3		Post intervention 4	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Green zone >250 L/min	3	20	4	27	6	40	8	53	10	66
High	2	13	3	20	5	34	5	33	3	20

*EFFECT OF PURSED LIP BREATHING ON RESPIRATORY PARAMETERS AMONG ASTHMATIC PATIENTS
SELECTED HOSPITALS AND AREAS OF NAVI MUMBAI*

yellow zone 200- 250 L/min										
Low yellow zone 80 and 200 L/min	4	27	5	33	2	13	1	7	1	7
Red zone ≤ 80 L/min	6	40	3	20	2	13	1	7	1	7

The **Table no.5** Above findings suggest that Green zone is improved from 3 (20%) to 10 (66%) High yellow zone is improved to 2(13%) and 3 (20%) Low yellow zone (27%) lowered to 1(7%) and Red zone lowered to 1 (7%) from 6 (40%) in post intervention 4.

Table no 6: Respiratory status by PEFR among asthmatic patients before and after pursed lip breathing.

n=15

PEFR Parameter s	Pre Intervention		Post intervention 1		Post intervention 2		Post intervention3		Post intervention 4	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Normal	3	20	4	27	6	40	8	53	10	66
Mild	2	13	3	20	5	34	5	33	3	20
Moderate	4	27	5	33	2	13	1	7	1	7
Severe	6	40	3	20	2	13	1	7	1	7

The **Table no. 6.** Depicts that normal PEFR parameter is improved from 3(20%) to 10 (66%), MildPEFR parameter is improved from 2 (13%) to 3 (20%). Moderate PEFR parameter is lowered from 4 (27%) to 1 (7%). Participants with severe PEFR parameter is lowered from 6 (40%) to 1 (7%) in post intervention 4.

Table No 7: Pre - Post Comparison to determine the effectiveness of PLB

n=15

Test	Mean	SD	T Test	DF	P-value	Result
Pre test	11.13	1.884	5.53935	14	<0.00001	p < .05 S
Post- test 4	6.4	2.720				

NS (Non-Significant)-P is \geq to 0.05

S (Significant)- p < .05

The **Table no 7** depicts pre-test shows mean 11.13 and SD 1.884, whereas post-test 4 shows mean 6.4 and SD 2.70 respectively. The 't' test value is 5.53935 with df was 14 and P-value is <0.00001. **The result shows significant Effectiveness (p<.05)** of pursed lip breathing on respiratory parameters of asthmatic patients. Therefore the null hypotheses H₀₁ is rejected.

Analysis of association of pre-interventional respiratory status with selected demographic variables

The calculated Chi square value of all the demographic variables found to be non-significant at the level of 0.05 hence the H₀₂ is accepted that is there is no association between pre interventional scores of respiratory parameters with selected demographic variables at 0.05 level of significance.

Discussion: The present study findings are supported by the Lee et al. who conducted a study aimed to compare the effectiveness of breathing control and pursed lip breathing techniques among bronchial asthma patients. As a quantitative research method, this study used a quasi-experimental study strategy. The study consisted of 60 participants who were randomly assigned to either the breathing control group or the pursed lip breathing group. The group A had Pursed lip breathing whereas group B had breathing control exercise. The results of the study showed that there was a significant improvement in the pulmonary function of both groups, but the pursed lip breathing group showed a greater improvement than the breathing control group. Group A (PLB) has gotten better than Group B (breathing control), according to the study. Before and after treatment, the average differences in peak flow expiratory flow rate between group A and group B are 43.33316.220 and 25.28918.002, respectively. The p-value of 0.007 shows that the finding was statistically important. The findings of the study suggest that pursed lip breathing is a more effective technique for bronchial asthma patients to improve their pulmonary function. ⁹

The case study conducted by Ikna C K and Henri S on 65 year old female with shortness of breath. After practising PLB By her, the relapse of hospital admission was prevented. The pursed-lip breathing intervention is supposed to help asthmatic clients feel less short of breath, as shown by the clients' own reports, but it has not been backed by normal breathing frequency as a measure of physical health. Theoretically, this study doesn't contradict what has already been done, so it can be used as a point of reference in future research. ¹⁰

Quasi experimental study with two group pretest and posttest design was conducted with 16 Chronic obstructive pulmonary disease (COPD) patients in each group. According to the data, the pursed-lip breathing exercise done in the intervention group led to a drop in shortness of breath from 3.19 to 1.69 and in the control group from 3.19 to 2.56. The test statistic's p-value is 0.026. People with chronic obstructive lung disease were able to feel less out of breath when they did exercises that involved pursed lips. ¹¹

CONCLUSIONS

Asthma is a chronic respiratory condition that affects people of all ages and is a major worldwide health concern. The researcher concludes from the study's findings that Pulse Lip Breathing has significant effect on respiratory parameters in asthmatic patients.

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SELECTED HOSPITALS AND AREAS OF NAVI MUMBAI*

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