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PURSED LIP BREATHING EXERCISE – A SELF-MANAGEMENT APPROACH TOWARDS SHORTNESS OF BREATH

BINU BABU,
Ph.D scholar, Nursing department, JJT University, Rajasthan, India
binuenchappanal@gmail.com

JINCY EALIAS
Ph.D scholar, Nursing department, JJT University, Rajasthan, India
jincyealias86@gmail.com

ABHILASH V
Ph.D scholar, Nursing department, JJT University, Rajasthan, India
abhilashvenunathan@gmail.com

ABSTRACT:

Respiratory patient's lung function declines as the disease progresses. Shortness of breath is the common symptom in most of the chronic respiratory conditions. As disease worsens or age advances breathlessness can occur even with minimal exertion and daily activities become more difficult. Breathing exercises are essential for patients with chronic lung diseases. Breathing exercises helps to conserve energy and promotes daily activities with less effort and less shortness of breath by increasing effectiveness of breathing. Pursed lip breathing exercise can be used by a patient when feels dyspnea, both during activities and even at rest. Pursed-lip breathing is a breathing exercise where inhalation of air slowly through nose and exhalation slowly through mouth by pursing the lips. It provides immediate symptomatic relief from breathlessness. Pursed-lip breathing primarily slows down the respiratory rate and assists in emptying the lungs of retained CO_2. It helps in self-recovery from chronic respiratory symptoms. Respiratory patients learn pursed lip breathing exercise spontaneously and uses as self-management approach in daily living activities. Regularly practiced pursed lip breathing is an effective self-management stratagem for individuals with chronic lung diseases to control breathing pattern, and increases exercise capacity.

Keywords: *Pursed lip breathing (PLB), Breathing exercise, Shortness of breath (SOB) and chronic respiratory diseases.*

I. INTRODUCTION

The respiratory system contributes to homeostasis by oxygen and carbon dioxide exchange between the atmospheric air, blood, and tissue cells. The body cells use oxygen for the metabolic reactions to produce energy and release carbon dioxide. As excess amount of CO_2 produces acidity which can be toxic to cells, it must be eliminated quickly and efficiently. The cardiovascular and respiratory systems conjoin to supply O_2 and eliminate CO_2.[1]

Respiration is the process of gas exchange which involves pulmonary ventilation (breathing), external pulmonary respiration and internal cellular respiration. [1] At rest, a normal human breathes 12 to 20 times a minute. About 500 mL of air per breath is inspired and expired. The inspired air mixes with the gas in the alveoli. By simple diffusion O_2 enters the blood in the pulmonary capillaries and CO_2 enters the alveoli. Like this, 250 mL of O_2 enters the body per minute and 200 mL of CO_2 is excreted. [2]

Respiratory health is achieved by effective inspiration and expiration. Clinical studies have proved that amount of oxygen in the body, exercise capacity, quality of life and even life span purely depends on optimal breathing. [3], [4]

Most of the respiratory disorders are chronic in nature which makes the person hard to breathe. Shortness of breath or breathlessness is a continuing issue among chronic respiratory patients especially during old age. Breathlessness can occur during daily activities or even at rest, accompanied by chest tightness and cough etc. patients with respiratory disorders have less exercise tolerance and their daily activities make them tired out and fatigued very soon. They may also be tensed and become panic as they lose control over breathing.

The breathing pattern of most of the respiratory patients is shallow, rapid and inefficient. More severe the disease, more incompetent the breathing pattern becomes. Ineffective breathing patterns

and shortness of breath are due to the ineffective respiratory mechanics of the chest wall and lung resulting from air trapping, ineffective diaphragmatic movement, airway obstruction, the metabolic cost of breathing, and stress.[5] Breathing retraining is an effective method to change the inefficient breathing to most effective respiration.

Rehabilitation is a health oriented practice that helps people with acute or chronic dysfunction to achieve the maximum possible level of functioning.[5] Pulmonary rehabilitation is an integral part in nursing care of patients with lung diseases in order to maximize the comfort. Each patient is accountable for his or her disease control. Self-care management is a positive approach to promote quality of life among chronic respiratory patients.

Patients with respiratory limitations gain greatest benefits with regular breathing exercise. Pursed lip breathing is the simplest breathing exercise to control shortness of breath that respiratory patients may learn spontaneously. Pursed lip breathing is a breathing exercise where patients are taught to inhale slowly through nose and exhale more slowly through pursed lips. Pursing the lips delays exhalation and slows respiratory rate. Continuous practice of pursed lip breathing exercise reduces shortness of breath and increase oxygen saturation.[6] It helps the patient to control the rate and depth of respiration. It also promotes relaxation, facilitating the patient to gain control over dyspnea and reduce feelings of panic.[5]

II. ESTIMATION OF LUNG DISEASES IN INDIA

Chronic pulmonary diseases are the leading cause of morbidity and mortality. The number of respiratory diseases is steadily increased in India. According to the report by World Health Organization (WHO) published in May 2014, lung disease deaths in India reached 11.97% of total deaths. This ranks India first in lung disease death in the world.[7] According to India's National Health Profile 2015, 3.5 million cases reported with acute respiratory infections, a 140,000 cases increased than previous year and an increase of 30% since 2010.[8] Recent reports points that cases of chronic respiratory diseases are on rise in cities of Andhra Pradesh, especially in Vijayawada, districts of Guntur and West Godavari. The incidence is aggravated mainly by vehicular pollution, air and dust pollution, habit of smoking and increased population.[9]

III. DEFINITION

Pursed lip breathing (PLB) is a breathing technique in which air is inhaled slowly through nose (as smelling a rose), keeping the mouth closed and exhaled slowly through mouth by lips holding in a pursed manner (as blow out a candle).

IV. PURPOSE

- To improve breathing and pulmonary status.
- To improve ventilation and oxygenation.
- To maximize lung capacity.
- To provide health related quality of life.
- To improve exercise capacity.
- To keep the airways open during exhalation to promote CO_2 excretion.
- To reduce shortness of breath.
- To prevent bronchiolar collapse and air trapping.
- To retrain the muscles of respiration.
- To improve gaseous exchange and lung fitness.
- To relieve respiratory symptoms.
- To reduce the days of hospitalization.
- To improve confidence and minimizes anxiety.

V. SIGNIFICANCE OF PLB

Chronic conditions have become one of the greatest health challenges. In many respiratory disease patients optimal pharmacological management results only

in minor improvement and patients continues to suffer from shortness of breath and exercise intolerance. Dyspnea cause respiratory drive and increase effort of breathing. Thus progressive dyspnea grabs functional capacity and autonomy which results poor quality of life.

VI. INDICATIONS

Any patient suffering from symptomatic respiratory illness can practice pursed lip breathing exercise. Common indications are;

- Dyspnea
- COPD
- Asthma
- Bronchitis
- Bronchiectasis
- Emphysema
- Lung abscess
- Atelectasis
- Cystic fibrosis
- Respiratory distress
- Hyperventilation
- Acute or chronic lung disease
- Pre-operative training for thoracic surgery
- Airway obstruction

VII. CONTRAINDICATIONS

PLB exercise is not practiced if the patient suffers from following conditions.

- Increased ICP
- Head or spinal injury
- Recent heart failure or MI
- Hemorrhage with hemodynamic instability
- Flail chest
- Rib fracture

VIII. PHYSIOLOGY OF PLB EXERCISE

Pursing the lips is holding the lips as in whistling or as one intends to extinguish the flame of a burning candle, creates a smaller opening for the air to flow through. Pursed lip breathing slows down exhalation, thus the respiratory rate gets reduced. Slow exhalation decreases airway resistance by impeding airflow and turbulence.[6] Prolonged and slow expiration increases expiratory airway pressure inside the airways and keeps the airways open which promotes CO_2 excretion thus reduce the air trapped in the lungs and prevent the airway collapse.[10],[11] Pursed lip breathing improves ventilation-perfusion by expanding lung volume, which eventually increase oxygen saturation temporarily for period of time the maneuver is being performed.[6] This helps the patient to control the rate and depth of respiration. It also promotes relaxation, enabling the patient to gain control over dyspnea and reduce feelings of panic.[5]

Pursed lip breathing exercise also helps in detoxification of body. PLB oxygenates the blood which give life to cells and eliminates CO_2, thus flush out toxins through exhalation.[12] Normally heart rate increases during inhalation and decreased during exhalation. As PLB prolongs exhalation it slows down the heart rate, thereby reduces the blood pressure.

IX. PREPARATION FOR PLB

No special preparation is required for PLB exercise. This exercise can be done in any position – sitting, standing, lying down or even in between activities such as walking, bending, lifting or stair climbing. Upright position is best than lying down as it provides maximum space for the lungs to expand. Since it is a self-management technique, the patient can decide the position, time and duration of exercise. Make the patient relax and comfortable before the exercise.

X. PROCEDURE

- Assume any comfortable place and position.
- Relax the neck and shoulder muscles.
- Inhale slowly through the nose keeping the mouth closed.
- Purse the lips and exhale slowly through the pursed lips.

- Repeat the steps.
- Take twice length for exhalation than inhalation.
- Don't do forceful exhalation. Let the air flow out slowly through pursed lips.
- Pursed lip breathing can be practiced 8-10 repetitions four or five times a day.
- It can be continued till shortness of breath is relieved.

XI. ADVANTAGES

- Act as a rescue exercise in case of acute exacerbations or dyspnea.
- Improved oxygen delivery and carbon dioxide elimination.
- Increases lung volume capacity.
- Enhances airway clearance.
- Instantaneous relief from SOB.
- Lowers muscle fatigue.
- Improvement in exercise capacity.
- Makes breathing easier.
- Promote relaxation and reduce stress.
- It is a self-manageable self-recovery approach.
- Can be used as energy conservation technique.
- Improved tolerance to dyspnea.
- Enhances optimal physical and social performance.
- Improvement in self-efficiency and autonomy.
- Simple, less time consuming and economical.
- Reduction in number of hospitalization and health care cost by self-management of symptoms.
- Plays a role in detoxification.
- Reduces heart rate and blood pressure.

XII. ROLE OF A NURSE

Nursing care of chronic respiratory patients focuses on managing symptoms, maximizing exercise capacity, improving quality of life and teaching breathing techniques. Patient education is crucial in management of chronic respiratory symptoms. The nurse assesses the patient's readiness for education and encourages participating in daily care. Teach and demonstrate the pursed lip breathing exercise procedure and make sure that the patients are following the correct technique. Educate the patient about the common symptoms. The nurse provides positive reinforcement when the patient makes an effort in self-care. Nurse trains the patient to practice PLB in their daily life. Teach the benefits of regular practice of pursed lip breathing. Include the family in patient's care. Advise the patient to avoid exposure to environmental triggers that worsens dyspnea such as air pollution, dust, temperature extremes and smoking. Recommend the patient to use pursed lip breathing in their daily life as an approach to conserve energy and gain a better quality life.

XIII. CONCLUSION

Pursed lip breathing is a controlled breathing to ease shortness of breath. It provides a quick and easy way to make each breath effective. It assists a patient with respiratory symptoms by reducing dyspnea and improving oxygenation and helps to achieve highest level of functioning. Pursed lip breathing exercise is simple, cost effective, easily applicable and appropriate for general respiratory patients.

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