

## **Implementation *Respiratory Muscle Stretch Gymnastic (RMSG)* to Extend Inspiratory and Expiratory Periods in Dyspnea Patients**

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### **Abstract**

*Dyspnea is a subjective sensation of shortness of breath. The emergency nursing problem that arises in dyspnea is ineffective breathing patterns. Ineffective breathing patterns are inspirations and/or expirations that do not provide adequate ventilation. Patients with ineffective breathing patterns are given airway management interventions, in addition to providing oxygen therapy to maximize oxygen entering the body, by providing the Respiratory Muscle Stretch Gymnastics (RMSG) breathing movement technique to help loosen the respiratory muscles to normalize the patient's breathing pattern. At the assessment stage, data was obtained on a case of dyspnea, namely COPD, with complaints of shortness of breath for three days but worsened on the day he was taken to the emergency room with the patient having an irregular breathing pattern, rapid pulse and a history of hypertension. Based on this assessment, a nursing diagnosis of ineffective breathing pattern was obtained with a nursing plan for 1x3 hours. The nursing plan that will be given is airway management with Respiratory Muscle Stretch Gymnastics (RMSG) therapeutic measures. The results of the analysis show that Respiratory Muscle Stretch Gymnastics (RMSG) is not appropriate to carry out in the emergency room where this action is less able to overcome ineffective breathing patterns in dyspnea patients in the emergency room.*

**Keywords:** *Dyspnea, Ineffective Breathing Pattern, Respiratory Muscle Stretch Gymnastics (RMSG).*

### **Introduction**

Respiratory disorders are medical conditions that affect a person's ability to breathe normally. This condition can affect the upper and lower respiratory tract. According to data from WHO (World Health Organization) in 2019, the top 10 causes of death accounted for 55% of the 55.4 million deaths worldwide. The top global causes of death, based on the total number of lives lost, are associated with three general topics: cardiovascular (ischemic heart disease, stroke), respiratory (chronic obstructive pulmonary disease, lower respiratory tract infections) and neonatal conditions – including birth asphyxia and birth trauma, neonatal sepsis and infections, and complications of premature birth. <sup>1,2,3</sup>

Lower respiratory tract infections remain the world's deadliest infectious disease, and are ranked the 4th leading cause of death. However, the number of deaths has decreased significantly: in 2019 the disease claimed 2.6 million lives, 460,000 fewer than in 2000. Deaths from non-communicable diseases continue to increase. Deaths from cancer of the trachea, bronchus and lung have increased from 1.2 million to 1.8 million and now rank 6th among the leading causes of death.<sup>1,4,5</sup>

Nationally the highest causes of death are cerebral vascular disease (21%), ischemic heart disease (12.9%), diabetes mellitus (6.7%), tuberculosis (5.7%), hypertension with its complications (5.3%), chronic lower respiratory tract disease (4.9%), liver disease (2.7%), transportation accidents (2.6%). Of all the respiratory disorders that cause death, all have signs and symptoms in the form of dyspnea.<sup>1,6,7</sup>

Dyspnea is the subjective sensation of shortness of breath. The American Thoracic Society defines dyspnea as "the subjective experience of breathing discomfort consisting of qualitatively distinct sensations of varying intensity. The experience results from the interaction between various physiological, psychological, social factors, And environment , and can causes secondary physiological and behavioral responses.<sup>8,9,10</sup>

The implementation of nursing to help patients overcome the problem of dyspnea (shortness of breath) in the Emergency Department is by providing nursing care that is able to reduce shortness of breath, with interventions given to patients, namely airway management (I. 01011).<sup>11,12,21</sup>

According to research conducted by Research conducted by Multazam *et al* believes that airway management interventions in the form of *Respiratory Stetch Muscle Gymnastic* (RMSG) significantly increases chest expansion and peak expiratory flow in the elderly by stretching the respiratory muscles in the thorax cage.<sup>4,22,23</sup>

*Respiratory Muscle Stretch Gymnastic* (RMSG) is an exercise that consists of stretching (*stretching exercise*) respiratory muscles and *breathing exercise*. This exercise is designed to reduce stiffness in the chest wall through activation of the diaphragm muscle fibers so that it can reduce the degree of shortness of breath.

RMSG can increase the outer cross-section of the muscle by increasing the number of muscle sarcomeres which affects the functional length of the muscle through the interaction of actin and myosin bonds and increasing the maximum inspiratory pressure which occurs due to increasing the tension relationship between muscle fibers which can reduce passive tension in the inspiratory muscles.<sup>13,14,15</sup>

Based on a preliminary study conducted at the Raden Mattaher Hospital Emergency Room, Jambi Province on May 27 2024, there were patients with a Medical Diagnosis of Dyspnea EC COPD with a Nursing Diagnosis of Ineffective Breathing Pattern (D.0005).<sup>16</sup>

With the description above, the author is interested in making the Final Scientific Work for Nurses (KIA-N) with the title "Nursing Care for Patients Using Application *Respiratory Muscle Stretch Gymnastic* (RMSG) to prolong the inspiratory and expiratory periods in Dyspnea patients in the Emergency Room at Raden Mattaher Regional Hospital, Jambi Province."<sup>17,24</sup>

## **Methods**

This type of research uses quantitative descriptive research, the research design uses descriptive research methods with a case study approach to nursing care, which starts from assessment, establishing nursing diagnoses, enforcing nursing interventions, implementing and carrying out nursing evaluations. The case study was carried out in the emergency room on 30 May 2024 at 21.30-23.30, 31 May 2024 and in the pulmonary ward on 03 June 2024 10.30-12.30. This case study uses 1 patient aged 73 years in the emergency room and 1 patient aged 53 years as respondents with nursing problems with ineffective breathing patterns, given intervention *Respiratory Muscle Stretch Gymnastic* (RMSG) for 2 hours is carried out in stages every 10 minutes as long as the patient can move and the patient's breathing pattern is monitored by counting the patient's breaths per minute every 10 minutes of movement. Respiratory frequency monitoring was carried out before and after administering the RMSG movement.

## Results

### Assessment

Study of Mr. S (73 years old) was carried out on May 30 2024 in the emergency room. Due to the reason he was admitted to the emergency room, the patient complained of shortness of breath for 3 days in the past and worsened today, the patient said he had a history of hypertension but it was not controlled. With TTV: BP: 200/121, Pulse: 112, RR: 30x/Minute, Temperature: 36 °C, CRT: < 2 Sec.

Study of Mrs. S (53 years old) was carried out on June 3 2024 in the pulmonary ward. The patient came to the emergency room at Raden Mattaher Regional Hospital on Wednesday, May 29 2024 with complaints of shortness of breath since 3 days ago, fever and decreased appetite, the patient said he had a history of asthma. During the assessment in the pulmonary ward, it was found that the patient appeared short of breath with a respiratory rate of 26x/minute TD: 120/80, Nadi : 100, Temperature: 36 °C, CRT : < 2 Seconds.

### Diagnosis and Intervention

From the results of the assessment, a nursing diagnosis was obtained for Mr. S (&3 Years) and Mrs. S (53 years old) is an ineffective breathing pattern and airway management nursing intervention with collaboration in providing techniques *Respiratory Muscle Stretch Gymnastic (RMSG)*.

### Implementation

Implementation of giving *Respiratory Muscle Stretch Gymnastic (RMSG)* to prolong expiratory and inspiratory periods in dyspnea patients. The implementation is given for 2 hours, given every 10 minutes to the patient according to the patient's ability to perform movements *Respiratory Muscle Stretch Gymnastic (RMSG)*. Providing techniques *Respiratory Muscle Stretch Gymnastic (RMSG)* by means of, relaxed position with your back straight. Slowly raise both shoulders while moving them back. At the same time, lean back while inhaling. After full inspiration, exhale slowly, relax and return to the original position. Then With your back straight, hold both hands behind your buttocks. After a full and slow inspiration, push your hands away from

your body while exhaling slowly. After full exhalation, breathe calmly and return to the original position. Continued With your back straight, hold your hands in front of your chest so that they are intertwined and palms inward. get full inspiration in this position. Then stretch your arms and bend your upper body as far forward as possible while exhaling slowly. After your arms are straightened and your hands are bent, take a full breath in that position. Then breathe calmly and return to the original position. And last With your back straight, hold both hands above your head with your arms extended and palms facing down. After full inspiration, in this position, pull your arms back while exhaling slowly. After exhalation, return to the original position and breathe calmly.<sup>8,18,19</sup>

## Evaluation

The breathing pattern is ineffective, the nursing problem has not been resolved and continuing intervention on the patient Mr. Mrs. 26x/minute.

### 1. Table of observation results Mr. S (73 years) in the ER

O'clock	RR	Spo2	TD
21.30	30	84%NRM	200/110
21.40	28	86%NRM	
21.50	29	90%NRM	
22.00	29	93%NRM	
22.10	28	98% ETC	
22.20	27	99% ETC	
22.30	28	99% ETC	
22.40	28	96% ETC	
22.50	27	95%	
23.00	26	96%	
23.10	27	96%	160/92
23.20	28	94%	
23.30	27	96%	

### 2. Table of observation results Mr. S (73 years old) in the pulmonary ward

O'clock	RR	Spo2	TD
10.00	28	84% NRM	
10.10	27	86% NRM	
10.20	27	90% NRM	
10.30	28	93% NRM	
10.40	26	98% NRM	
10.50	27	99% NRM	
11.00	28	99% NRM	145/57

### 3. Table of observation results of Mrs. S (53 years old) in the Pulmonary ward

O'clock	RR	Spo2	TD
10.30	26	96	122/78
10.40	26	93	
10.50	22	94	
11.00	23	98	130/80
11.10	22	98	
11.20	23	97	
11.30	22	98	125/83
11.40	21	98	
11.50	22	98	
12.00	21	95	120/80
12.10	22	95	
12.20	22	96	
12.30	22	98	120/84

## Discussion

Nursing interventions are all actions carried out by nurses based on knowledge and clinical judgment to achieve desired results.<sup>25</sup> After the RMSG movement intervention (*Respiratory Muscle Stretch Gymnastik*) for 3 hours of observation.

Research conducted by Ulfa Nurrohmah et al on The Combination Of Upper Limb Exercise And Respiratory Muscle Stretch Gymnastics On Dyspnea Among COPD Patients found that the combination of Upper Limb Exercise and Respiratory Muscle Stretching Gymnastics used in addition to conventional rehabilitation methods, was proven to be effective in reducing dyspnea in COPD patients. These exercises can support pharmacological therapy to reduce dyspnea<sup>26</sup>.

Another research conducted by Ali Muntazam et al regarding Combination Administration *Respiratory Muscle Stretch Gymnastic* (RMSG) with Breathing Exercises *Buteyko* in Increasing Chest Expansion and Peak Expiratory Flow in the Elderly The result is that combination *respiratory muscle stretch gymnastic* with breathing exercises *buteyko* influential and has a significant value compared to interventions *respiratory muscle stretch gymnastic* alone on increasing chest expansion and peak expiratory flow in the elderly<sup>27,28,29</sup>.

Overall, it can be concluded that if only by providing techniques *respiratory muscle stretch gymnastic* Only in dyspnea patients with a nursing diagnosis of ineffective

breathing patterns in the emergency room is less effective in reducing dyspnea where there is no significant change in the patient's breathing pattern.<sup>30</sup>.

The problem of ineffective breathing pattern nursing in both cases has not been successfully resolved by taking action based on the Indonesian Nursing Intervention Standards. Innovative action of combination administration *Respiratory Muscle Stretch Gymnastic* (RMSG) in the Emergency Room for 1 x 10 minute monitoring for 3 hours. The result was that the patient's breathing pattern did not improve in Mr. S (73 Years). Meanwhile, Mrs. S (53 years old) in the pulmonary ward said his breathing became easier.

Based on several studies that the author has reviewed, it is said that if only gifts *Respiratory Muscle Stretch Gymnastic* (RMSG) alone does not have significant changes to improve breathing patterns. So it must be done in collaboration with other techniques such as breathing *boteyko* or with other techniques with longer and more routine interventions.

## **Conclusion**

Providing collaboration *Respiratory Muscle Stretch Gymnastic* (RMSG) in patients with pattern nursing problems less effective breathing has a significant effect on patients, where there is no change in the expiratory and inspiratory phases which are prolonged after administration *Respiratory Muscle Stretch Gymnastic* (RMSG). It is hoped that this case study can increase insight, knowledge and references for students in nursing regarding engineering *Respiratory Muscle Stretch Gymnastic* (RMSG) and can develop research related to nursing problems with ineffective breathing patterns.

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