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# Implementing Actions On The Chest To Remove Sputum (Phlegm) In The Respiratory Tract That Is Not Normal

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**ABSTRACT**

Sputum is a material expelled from the lungs and trachea through the mouth. Sputum expelled by a person should be able to be evaluated for its source, color, volume and consistency because the condition of sputum usually specifically shows the pathological process of the formation of sputum itself. The purpose of this study is to eliminate breathing difficulties caused by accumulation of secretions so that the client does not become tired when cleaning secretions and is able to expel phlegm optimally. The research method used is One Group Pre-test Post-test, which is a research design that only uses one group of subjects (without a control class) and carries out measurements before and after giving treatment to the subjects. The results of the study showed that the phlegm discharge in patients before the effective coughing exercise was carried out with the category of 54 people (60%) coming out and 36 people (40%) not coming out. The conclusion is that A significance value of <0.05 (p=0.000) was obtained, meaning that Ha was accepted, meaning that effective coughing exercises can increase phlegm excretion in patients.

**Keyword :** Implementation Of Measures, Remove, Sputum (Phlegm) Respiratory Tract, Not Normal

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## 1. Introduction

Sputum is mucus and other material brought up from the lungs, bronchi, and trachea that may be coughed up and vomited or swallowed. Normal adults produce sputum ± 100 ml/day. If production is excessive, the cleaning process may no longer be

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effective so sputum will accumulate. It is necessary to study the source of sputum, color, volume and consistency of sputum (Muttaqin, 2008).

Sputum is a material expelled from the lungs and trachea through the mouth. Sputum expelled by a person should be able to be evaluated for its source, color, volume and consistency because the condition of sputum usually specifically shows the pathological process of the formation of the sputum itself. Sputum examination is important to diagnose the etiology of various respiratory diseases. Microscopic examination can explain the causative organisms in various bacterial pneumonia, tuberculosis, and various types of fungal infections. The best time to collect sputum is after waking up, because abnormal bronchial secretions tend to collect during sleep (Somantri, 2012).

The airways are ineffective in removing secretions that are not smooth which makes it difficult for the patient to breathe, interferes with gas exchange in the lungs and causes cyanosis, fatigue, apathy and weakness. In the next stage, the airways become narrowed so that they stick together. For this reason, assistance is needed to remove sticky phlegm to clear the airways effectively again. (Fauzi et al., nd, 2016) Difficulty in clearing secretions is a major cause of upper respiratory tract infections in patients, and one of the efforts to clear the airways is effective coughing. (Ayu Novita Permatasari, Ni Luh Putu Eka Sudiwati, 2019).

Effective coughing is important to relieve breathing difficulties caused by accumulation of secretions so that the client does not become fatigued while clearing secretions. Effective coughing is a proper coughing method where the client saves energy so that they do not become tired and are able to expel phlegm optimally. An effective cough is designed to expand the lungs, mobilize secretions and prevent the side effects of secretion accumulation. Ineffective coughing can have detrimental effects on clients with respiratory illnesses. (Sinaga et al., 2022).

How to Remove Sputum:

a. Deep breathing is a form of breathing exercise consisting of abdominal (diaphragmatic) breathing and purs lips breathing. The purpose of abdominal

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breathing is to allow for full deep breathing with minimal effort. Pursed lips breathing helps clients control excessive breathing. The procedure is: adjust to a comfortable position, flex the patient's knees to relax the abdominal muscles, place 1 or 2 hands on the abdomen just below the ribs, take a deep breath through the nose, keep the mouth closed, count to 3 during inspiration, exhale air through the lips as if blowing (purs lips breathing) slowly.

b. Coughing is a reflex reaction that occurs due to stimulation of nerves in the inner lining of the respiratory tract. Effective coughing is an exercise in expelling accumulated and disturbing secretions in the respiratory tract by coughing.

c. Postural Drainage is an intervention to release secretions from various segments of the lungs using the influence of gravity. The procedure is: wash hands, select the blocked area to be drained, based on all lung areas lay the patient in a position to drain the blocked area, ask the patient to maintain the position for 10-15 minutes, position and vibrate the chest above the drained area after drainage in the first position ask the patient to sit and cough if not coughing ask the patient to rest for a while if necessary, encourage the patient to drink a little water, repeat the steps above until all areas have been drained, repeat the chest assessment in all lung fields, wash hands and document.

d. Chest Physiotherapy aims to mechanically release secretions attached to the bronchial walls, thereby increasing the efficiency of the breathing pattern. The procedure is: cover the area to be percussed with a towel or clothing to reduce pain, encourage deep and gentle breathing to increase relaxation percussion of each lung segment for 1-2 minutes, percussion should not be performed on areas with structures that are easily injured such as the mammary glands, sternum and kidneys.

e. Vibration is a series of strong vibrations produced by the nurse's hands placed flat on the patient's chest wall. Vibration is used after percussion to increase expiratory air turbulence and loosen thick mucus. The procedure is: place the palms facing down on the chest area to be drained, one hand on top of the other with the fingers together and extended alternatively the hands can be placed side by side, encourage the patient to take a deep breath through the nose and exhale slowly through the mouth or pursed

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lips, during the expression tense all the muscles of the hand and arm and use almost all the heels of the hands, vibrate the hands, move the hands downwards stop the movement if the patient inhales each time vibration, encourage the patient to cough and remove secretions into the sputum container, if the sputum cannot be expectorated.

f. Use of Nebulizers (Indonesian Ministry of Health, 2011).

## 2. Research Methods

This study is a Quasi Experiment type of One Group Pretest Postest design, the study was conducted to see the effect of physiotherapy on airway clearance in children aged 6-12 years which was analyzed using the Wilcoxon test. This study was conducted at the Healthy Clinic with a sample of 18 respondents using a purposive sampling technique. This type of research is pre-experimental research with a quantitative approach. The research design used is One Group Pre-test Post-test, which is a research design that only uses one group of subjects (without a control class) and carries out measurements before and after giving treatment to the subjects. In this design, the treatment is given twice, where measurements are previously taken with observations before and after the treatment.

## 3. Results and Discussion

### a. Results

**Table 1.**
**Frequency Distribution of Phlegm Expiration in Patients Before Being Given Effective Coughing Exercises**

| No | Phlegm Exposure | Frequency | Percentage |
|---|---|---|---|
| 1 | Go out | 54 | 60% |
| 2 | Not Exiting | 36 | 40% |
| | **Total** | 90 | 100% |

Based on table 1. seen that the phlegm discharge in patients before the effective coughing exercise was carried out was 54 people. (60%) And No go out that is 36 people (40%).

**Table 2.**

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**Normality Test of the Effect of Effective Cough on Sputum Expel On Patient in Healthy Clinic**

| No | Group | Sig | Information |
|---|---|---|---|
| 1 | Pretest | 0,000 | Abnormal |
| 2 | Posttest | 0,000 | Abnormal |

Based on table 2. shows that the data is not normally distributed because the *p-value* < 0.05, so that For To determine whether or not there is an effect of effective cough on the expulsion of phlegm in patients is assessed based on test statistics non-parametric *Wilcoxon.*

**b. Discussion**

**1. Phlegm Expiration in Patients Before Effective Coughing Exercises**

Based on the data from the research on phlegm discharge in patients before being given effective coughing exercises at the Healthy Clinic, the results were obtained with the category of discharge, namely 54 people (60%) and not discharged, namely 36 people (40%).

The average value of sputum discharge in patients before effective coughing exercises was 1.40. The average value indicates that sputum discharge in patients is in the discharge category. Adherent secretions often cause the respiratory tract to be ineffective in releasing secretions that make it difficult for patients to breathe, interfere with gas exchange in the lungs and cause cyanosis, fatigue, apathy and weakness. (Fauzi et al., nd, 2016).

Ineffective airway clearance is the inability to maintain airway clearance resulting in airway obstruction in the form of phlegm (Pawidya, 2019). Appropriate management for patients with ineffective airways is to maintain or improve pulmonary ventilation and oxygenation, improve comfort and ease of breathing, remove sputum, improve the ability to participate in physical activity, and to prevent risks associated with oxygenation problems such as skin and tissue damage (Wayne, 2019).

**2. The Effect of Effective Coughing Exercises on Sputum Expel in Patients with ARI**

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The results of statistical tests using *Wilcoxon* obtained the average sputum output in patients, before being given effective coughing exercise of 1.40 and after effective coughing exercise of 1.10 with a probability value (p = 0.000), therefore (p < 0.05) it can be concluded that effective coughing exercise can increase phlegm excretion in patients.

Average posttest score in the outgoing category because of respondents have receive effective coughing exercises to increase sputum expectoration in patients with ARI. The effective coughing exercises given in this study showed significant results compared to not being given effective coughing exercises. The purpose of providing effective coughing exercises is to expel all the air from the lungs and airways so as to reduce the frequency of shortness of breath, save energy so that you don't get tired easily and can expel phlegm optimally, train the respiratory muscles so that they can function properly and train clients to get used to doing good breathing methods. (Directorate General of Health Services, nd 2022).

From the results of the study by (Chania et al, 2020) after the chest percussion technique (clapping) and vibration, respondents experienced an increase in sputum output. Respondents who did not produce sputum were (26.7 %) and sputum that did produce was (73.3%) and a p value of 0.002 was obtained. There is a significant effect p value = 0.002 (p value <0.05). This is confirmed by research (Prasetyo et al, 2017) chest percussion (clapping) can mechanically release sputum that accumulates in the airways, chest percussion (clapping) is also used to smooth the turbulence of exhaled air to facilitate secretions to come out.

According to Suhanda and Rusmana (2014) vibration is an action carried out by providing compression to the chest that can move secretions into the airway and vibration can only be done when the patient exhales. Vibration is a technique of vibrating the chest to push secretions from the airway so that secretions can come out easily by instructing the client to inhale slowly through

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the nose and exhale through the mouth with the lips forming the letter "o" after that vibrate quickly for 5 minutes (Ningrum et al, 2019).

## 4. Conclusion

The conclusion of this study is:

a) 60% of sputum discharge in patients with ISPA before effective coughing exercises are included in the discharge category and 40% are included in the non-sputum discharge category. 90% of sputum discharge in patients with ISPA after effective coughing exercises are included in the discharge category and 10% are included in the non-sputum discharge category.

b) The significance value obtained (sig.2-tailed) < 0.05 ( p = 0.000), meaning that Ha is accepted, meaning that effective coughing exercises can increase phlegm excretion in patients.

## 5. Compliance with ethical standards

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### Disclosure of conflict of interest

This research collaboration is a positive thing for all researchers so that there will be no conflicts, in fact this is a challenge that must be resolved together.

### Statement of informed consent

Every action we take as writers is a mutual agreement.

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