

**THE EFFECTIVENESS OF PEPPERMINT AROMATHERAPY INHALATION
IN NURSING CARE FOR INEFFECTIVE AIRWAY CLEARANCE IN PULMONARY TUBERCULOSIS
PATIENTS AT DRAJAT PRAWIRANEGARA HOSPITAL, BANTEN, INDONESIA: CASE STUDY**

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Abstract

Background: Tuberculosis is the disease with the 13th highest mortality rate in the world and the second largest after Covid-19. Pulmonary Tuberculosis is the highest cause of death due to tuberculosis bacterial infection. **Objective:** This study aims to determine the effectiveness of Peppermint Aromatherapy Inhalation on nursing care for ineffective airway clearance in Pulmonary Tuberculosis patients at Drajat Prawiranegara Hospital. **Methods:** The research method used is qualitative research with a research design that is a case study through a Nursing Care Approach which includes nursing assessment, nursing diagnosis, nursing intervention, nursing implementation, and nursing evaluation. The subjects of this study were two patients with pulmonary tuberculosis who experienced the problem of ineffective airway clearance at RSUD Dokter Drajat Prawiranegara, Serang City, Banten, Indonesia. **Results:** The application of *peppermint aromatherapy inhalation* which was carried out three times a day for three consecutive days was found that the patient could expel phlegm and decreased respiratory frequency. **Conclusion:** The results of this study found that the application of *peppermint aromatherapy inhalation* can reduce the problem of airway clearance ineffectiveness which includes coughing up phlegm and shortness of breath in patients with pulmonary tuberculosis.

Keywords: Peppermint Aromatherapy, Ineffective Airway Clearance, Pulmonary TB.

Introduction

The World Health Organization (2022) states that tuberculosis is the disease with the highest mortality rate based on data for as long as the world's population has been infected with tuberculosis germs. Tuberculosis (TB) is an infectious disease that causes the 13th largest death in the world and the second largest after Covid-19. Pulmonary Tuberculosis is the highest cause of death in the world due to tuberculosis. Silitonga et al., (2020) stated that

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peppermint inhalation is a simple complementary therapy in the form of inhalation using natural ingredients to help smooth the respiratory tract. *Peppermint* contains menthol aroma and has anti-inflammatory properties that can reduce the feeling of tightness. The benefits of *peppermint aromatherapy inhalation* not only soothe the nose, but can make breathing lighter, also serve as a temporary mild anesthetic, and help treat flu and prevent inflammation. Ichsan et al., (2022) also stated that *peppermint inhalation* is the inhalation of warm steam from boiling water that has been mixed with aromatherapy as a warming ingredient, such as mint leaves. Apart from using mint leaves, you can also use peppermint essential oil which can be inhaled directly or using a diffuser. Giving *peppermint aromatherapy inhalation* is proven to be able to overcome the problem of ineffective airway clearance in Pulmonary Tuberculosis patients studied by Silitonga et al., (2020) regarding "The Effect of Simple Inhalation Using Mint Leaves (*Mentha Piperita*) on Reducing Shortness of Breath in Patients with Pulmonary Tuberculosis in the "UPT Puskesmas (Public Health Center) Tandang Buhit Balige Environment". This study was conducted on 28 respondents with the result that there was an effect of giving simple inhalation of mint leaves on reducing shortness of breath in patients with pulmonary tuberculosis seen from the results of the T-Paired T-Test with a value of $0.000 < 0.005$. In previous research on *peppermint inhalation* is a simple complementary therapy in the form of inhalation using natural ingredients that can help smooth the respiratory tract The research conducted by researchers used quantitative research using research instruments. In this study, to better understand the benefits of this research, the authors are interested in conducting qualitative research with a case study entitled "The Effectiveness of Peppermint Aromatherapy Inhalation Action on Nursing Care for Ineffective Airway Clearance in Pulmonary Tuberculosis Patients at Dradjat Prawiranegara Hospital, Serang City, Banten, Indonesia".

Methods

The research method used is qualitative research with a research design, namely a case study using a nursing care approach which includes nursing assessment, nursing diagnosis, nursing intervention, nursing implementation, and nursing evaluation. The case study that is the subject of this research is used to explore the problem of nursing care for ineffective airway clearance in Pulmonary Tuberculosis patients with the application of *peppermint aromatherapy inhalation*.

It was conducted in the inpatient unit of internal medicine at RSUD Dokter Dradjat Prawiranegara in February 2024. The implementation given to the research subjects was carried out for 3 (three) days. The inclusion criteria in this study were Pulmonary Tuberculosis patients who did not have effective airway clearance problems. The research instruments used in this study were nursing care formats in the form of assessment sheets, nursing diagnosis sheets, nursing intervention sheets, nursing implementation sheets, observation

sheets, evaluation sheets, modified Medical Research Council (mMRC) dyspnea sheets, tools used to carry out physical examinations, tools used to perform *peppermint aromatherapy inhalation*, and standard operating procedures for *peppermint aromatherapy inhalation*. Ethical aspects of the study: Consent form, Confidentiality and Anonymity. The data analysis method starts from the research data which will be grouped and analyzed based on subjective and objective data. From the results of data analysis, nursing problems can be found and established, then develop outcome criteria and nursing interventions, as well as implement and evaluate the results of their actions.

Research Results

Nursing Assessment

1. Patient Identity

Patient Identity	Patient 1	Patient 2
Name	Mr. T	No. SR
Age	40 years	15 years
Gender/Gender	Men	Female
Religion	Islam	Islam
Education	Graduated from high school	High school
Jobs	Labor	Students
Tribe	Java/Indonesia	Sundanese/Indonesian
Marital status	Married	Single
Address	Kalang Anyar Village, Taktakan Subdistrict, Serang City, Banten.	Cibuntu Village, Parakan Village, Jawilan sub-district, Serang, Banten.
Medical Record Number	00.52.26.58	00.52.38.23
Medical diagnosis	Pulmonary Tuberculosis	Pulmonary Tuberculosis
Date of Hospital Admission	January 28	February 12
Interview Date	February 7	February 15
Sources of information	Patients and their families	Patients and their families
Person in charge	Mrs. S	Mrs. M

2. Disease History:

History of the Disease	Patient 1	Patient 2
Chief Complaint	The patient complained of chest tightness	The patient complains of shortness of breath
History of Current Illness	<p>The patient said he came to Drajat Prawiranegara Hospital on January 28 with complaints of chest tightness accompanied by abdominal pain, fever, and a lot of phlegm. Patients feel a sense of tightness like being hit by a heavy object so it is difficult to breathe in the chest and concerns about phlegm in the throat so it is difficult to remove phlegm. Patients experience shortness of breath after strenuous activities that interfere with activities and narrow terraces at any time.</p> <p>The results of the physical examination obtained additional auspicious sound ronchi, there is excess sputum, BP: 90/60 mmHg, pulse 78x/min, respiration 27x/min, temperature 36.8°C, and SpO₂: 95%</p>	<p>The patient said he came to the emergency room of Drajat Prawiranegar Hospital on February 12 with complaints of shortness of breath accompanied by abdominal pain and cough with phlegm. The patient said the shortness of breath he experienced made him feel cranky, chest tightness. Patients feel shortness of breath interferes with daily activities until now the change of clothes also feels tight and feels tight all the time.</p> <p>The results of the physical examination found the patient heard additional ronchi breathing sounds, the presence of excess sputum, BP: 100/70 mmHg, pulse 154x/min, respiration 29x/min, temperature 37.4°C, and SpO₂ 86%.</p>
Previous Medical History	<p>The patient said he had never had pulmonary tuberculosis before and as a child never had a severe cough. The patient said he was taking anti-tuberculosis drugs during treatment at Drajat Prawiranegara Hospital. The patient said he had lost weight before 60 KG. The patient had never been</p>	<p>The patient's family said that the patient had previously suffered from pulmonary disease and was only diagnosed with TB after the X-ray results came out on February 13. The patient's family said the patient was on OAT treatment after being diagnosed with pulmonary tuberculosis. The patient's family said that the patient previously went to the</p>

	treated before and only went to the clinic because of abdominal pain.	puskesmas for complaints of abdominal pain and shortness of breath last month. The patient said his weight had dropped from 60 KG to 50 KG over the course of one month.
Family history	The patient said there was no family history of the same disease or any other hereditary disease.	The patient's family stated that none of their family members suffered from the same disease as the patient and there was no history of hereditary diseases.

3. Physical examination

Observation	Patient 1	Patient 2
Vital Signs		
General Conditions	Medium	Medium
GCS	E4V5M6	E4V5M6
Blood pressure	90/60 mmHg	100/70 mmHg
MAP	70 mmHg	80 mmHg
Beats	78x/min	154x/min
Breathing	27x/min	29x/min
Temperature	36,8°C	37,4°C
Saturation	95%	86%
Anthropometry		
Weight	51kg	50kg
High	170 cm	158 cm
BMI	17.64 (underweight)	20.02 (normal weight)
Persistem		

Respiratory system	<i>Inspection:</i> The nasal shape is symmetrical, there is no exhalation in the nostrils, there is the use of respiratory muscles, the anterior-posterior diameter proportion is reduced.	<i>Inspection:</i> The nasal shape is symmetrical, there is nasal lobe breathing, no use of respiratory muscles, normal anterior-posterior diameter proportion of 1:2.
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<p><i>Palpation:</i> There was no tracheal displacement, decreased fremitus tactics, no time and lesions, and no tenderness.</p> <p><i>Tap:</i> The upper lung border at ICS II and the lower lung border at ICS V. Hyperresonant percussion sound present</p> <p><i>Auscultation:</i> There is the additional breath sound of ronchi.</p>	<p><i>Palpation:</i> There was no tracheal shift, decreased tactile fremitus, no periods and lesions, and no tenderness.</p> <p><i>Tap:</i> It is the upper border of the lung at ICS II and the lower border of the lung at ICS V. Sonorous percussion sound.</p> <p><i>Auscultation:</i> There is the additional breath sound of ronchi.</p>
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4. Laboratory

Patient 1

Patient 2

Inquiry	Results	Reference Value	Unit
HEMATOLOGY			
Hematology Routine			
Hemoglobin	11.8 L	13.0-17.0	gram/dL
hematocrit	35 L	40.0-52.0	%
Leukocytes	11.800 H	4.400-11.300	/uL
Platelets	240.000	150.00-450.000	/uL
CLINICAL CHEMISTRY			
Kidney function			
ureum	36	6.0-46.0	mg/dL
Creatinine	1.1	0,6-1,5	mg/dL
Electrolytes			
Sodium (Na)	134 L	135-148	mmol/L
Potassium (K)	4.39	3.3-5.9	mmol/L
Chloride (Cl)	102	96-120	mmol/L
Carbohydrates			
Blood Glucose at one time	94	Normal: <140 Pre DM: 140-200	mg/dL

Inquiry	Results	Reference Value	Unit
HEMATOLOGY			
Hematology Routine			
Hemoglobin	13.0	13.0-17.0	gram/dL
hematocrit	40	40.0-52.0	%
Leukocytes	7.440	4.400-11.300	/uL

Platelets	321.000	150.00-450.000	/uL
CLINICAL CHEMISTRY			
Liver function			
AST (SGOT)	31	0-34	U/L
ALT (SGPT)	10	0-55	U/L
Carbohydrates			
Blood Glucose at one time	86	Normal: <140 Pre DM: 140-200	mg/dL

5. Diagnostic Test Results:

a. Patient X-ray 1:

Cor: CTR < 50%, normal aorta.

Lung: there is an increased bronchovascular smear. There is a vascular lucif shadow in the lower plane of the right hemithorax with collapsed lung tissue medially, and infiltrates appear in the left suprahiller. The right and left hilar are not thickened. The sinuses and diaphragm are normal. Bones and soft tissues are in good condition Conclusion: Right pneumothorax and pulmonary tuberculosis are very likely.

b. Patient X-ray 2:

Cor: CTR < 50%, normal aorta.

Lungs: there is an increased bronchovascular smear picture. Infiltrates appear in the upper to lower fields of both lungs. The right-left hilar is not thickened. Sinuses and diaphragm are normal. Soft tissue bones are good. Conclusion: Pulmonary Tuberculosis

6. Drug therapy

a. *The first patient* required drugs are paracetamol 3x500 mg orally, Isoniazid 1x300 mg orally, rifampicin 1x450 mg orally, pyrazinamide 1x1000 mg orally, ethambutol 1x1000 mg orally, ceftriaxone 1x2 gr via IV, levofloxacin 1x750 mg route IV, oxygen 3 liters/minute with nasal cannula.

The medications needed by the *second patient* were ondancetron 2x4 mg IV line, ranitidine 2x1 amp IV line, ceftriaxone 1x2 gr IV line, dexamethasone 2x1 amp IV line, levofloxacin 1x750 mg IV line, IVFD NaCl 0.9% 500cc/8 hours IV line, N. Acetylsteine 3x1 tab by oral route, paracetamol 3x1 tab by oral route, sucralfate 3x1 cth by oral route, rifampicin 1x450 mg by oral route, ethambutol 1x500 mg by oral route, tubercle formation 1x1000 mg by oral route, alveolar membrane damage 1x300 mg orally.

Nursing Diagnosis

Based on the results of data analysis, nursing diagnoses can be established in patient one, namely ineffective airway clearance associated with airway hypersecretion characterized by patients complaining of shortness of breath, ineffective cough, inability to cough, excess sputum, additional respiratory sounds, and changes in respiratory frequency (27x/min).

Nursing diagnoses can be established in two patients, namely ineffective airway clearance associated with airway hypersecretion characterized by patients complaining of shortness of breath, excessive sputum, additional breathing sounds, and changes in breathing frequency (29x/min).

Nursing Interventions

Nursing Output Standards: After intervening for 3x24 hours, effective airway clearance improved with the criteria: Sputum production decreased (5), Additional breath sounds decreased (5), Dyspnea decreased (5), Breathing frequency improved (5).

Nursing Intervention Standards:

Key Interventions:

Airway Management (I.01011)

The study was conducted by observing patients' breathing patterns, additional respiratory sounds, and sputum; and also teaching the effectiveness of coughing techniques.

Support Intervention:

Aromatherapy (I.08233) The study was conducted by identifying preferred and non-preferred scents, identifying levels of pain, stress, anxiety, and natural feelings before and after aromatherapy, monitoring discomfort before and after aromatherapy, and monitoring problems that occurred during aromatherapy administration.

Nursing Implementation

The implementation carried out in this study was monitoring vital signs before inhalation, monitoring breathing patterns, monitoring additional breath sounds, identifying preferred and disliked aroma options, selecting peppermint essential oil, administering essential oil by inhalation method, teaching effective coughing techniques, monitoring sputum, monitoring discomfort before and after inhalation, monitoring problems that occur during inhalation, and monitoring vital signs after inhalation.

Nursing Evaluation

Patient 1, The first day evaluation in the first patient was the presence of excess white and odorless sputum; respiratory frequency: 27x/min; there were additional breath sounds in the form of ronki. On the second day the patient still heard additional breathing sounds, respiratory frequency 26-27x/min, sputum was not released at the time of the action but the patient's discharge had a white odorless liquid... On the third day, the patient still heard additional respiratory noises, the respiratory frequency decreased to 25-23x/min, there was a decrease in sputum on the third action, the patient was able to remove white sputum and had no odor. On the fourth day, the amount of sputum released by the patient was not as much as before, the frequency of breathing improved (20x/min), but additional respiratory ronchi sounds were still heard.

Patient 2

Evaluation of the first day in the second patient was that there was a lot of sputum at the patient's sputum discharge site which was white and odorless, there was still an additional ronchi breathing sound, the frequency of breathing was still above normal (29x/min). On the second day, the patient's additional ronchi breathing sound was still heard, the frequency of breathing was still above normal (27-28x/min), and sputum was still released slightly with white liquid, and no odor. On the third day, the patient passed a small amount of sputum, white in color and odorless after the third procedure; the additional breathing sound of ronchi was still heard, the breathing frequency was still above normal (26x/min). On the fourth day, the amount of sputum secreted by the patient was only a little, the respiratory frequency decreased to 25x/min, the additional ronchi sound was still heard.

Discussion

Nursing Assessment

Assessment of patient 1 was conducted on February 7, 2024, while patient 2 was conducted on February 15, 2024. The results of the assessment, patient 1 showed complaints of shortness of breath accompanied by coughing, more sputum, and fever, while patient 2 showed complaints of shortness of breath accompanied by complaints of shortness of breath accompanied by coughing more phlegm and abdominal pain. This is in accordance with Ekaputri et al. (2022) which states that complaints that are often found in patients with pulmonary tuberculosis are usually in the respiratory department such as coughing and shortness of breath, while systemic complaints such as fever and weight loss.

Assessment of the degree of shortness of breath in patient 1 with a score of 1 which occurs after doing strenuous activity, while in patient 2 with a score of 4-5 which occurs after walking for less than 15 minutes or after changing clothes. This is in line with research by Williams (2017) who used the mMRC dyspnea form to assess the severity of shortness of breath that interferes with daily activities. which interferes with daily activities used in patients with respiratory disorders. Research conducted by Silitonga et al. (2020) used the mMRC dyspnea instrument as a measure of the degree of shortness of breath to make it easier to measure the decrease in respiratory frequency or shortness of breath in patients with pulmonary tuberculosis.

Weight loss occurred in both patients. Patient 1 previously weighed 60 kg and dropped to 51 kg due to decreased appetite caused by decreased appetite, while patient 2 who previously weighed 60 kg dropped to 50 kg due to decreased appetite and unhealthy food. This is in accordance with the theory put forward by Latif et al. (2023) which states weight loss in patients with pulmonary tuberculosis. Nurjannah & Sudana (2017) stated that weight loss is caused by tuberculosis bacterial infection due to malabsorption, increased energy

needs, disruption of metabolic processes and reduced food intake due to decreased appetite resulting in wasting conditions (decreased muscle mass and fat).

The results of the physical examination found a disturbance in the respiratory system. Patient 1 was found to use the auxiliary muscles of the respiratory muscles, the proportion of the anterior-posterior diameter decreased, there was a decrease in tactile fremitus, hyperresonant percussion sound, and additional ronchi breath sounds, while patient 2 was found to have nasal lobe breathing, decreased tactile fremitus, and additional ronchi breath sounds. Research conducted by Nugraha (2023) states that there is abnormal data from the physical examination of the respiratory system, starting from inspection there is a decrease in anterior-posterior to lateral diameter, palpation of decreased tactile fremitus, percussion is generally loud and hyperresonant in some cases, and auscultation found additional breath sounds such as ronki.

Nursing Diagnosis

Based on data analysis, the symptoms found in patient 1 are complaints of shortness of breath, unable to cough, ineffective coughing, excess sputum, additional ronchi breath sounds, and high respiratory frequency, excess sputum, additional ronchi breath sounds, and respiratory frequency changes (27x/min) while symptoms in patient 2 were found that the patient complained of shortness of breath, there was excess sputum, there was additional ronchi sound, and respiratory frequency changed (29x/min-27x/min). This is in accordance with the signs and symptoms, both major and minor diagnoses, namely nursing diagnoses of airway clearance ineffectiveness associated with airway hypersecretion.

According to Nursing Diagnoses ineffective airway clearance associated with airway hypersecretion and research conducted by Nugraha (2023) which states that in Lung Tuberculosis patients with ineffective airway clearance problems obtained subjective data, namely shortness of breath. Subjective data obtained are shortness of breath and coughing up phlegm, while objective data is obtained data unable to cough, excessive sputum production, and noise is heard.

And according to PPNI (2017) ineffective airway clearance Indonesian Nursing diagnoses found sputum production, and additional ronchi breath sounds were heard. This causes the ineffectiveness of airway clearance nursing diagnoses in accordance with PPNI (2017) in the Indonesian nursing diagnosis standard.

Nursing Interventions

Based on the diagnosis that has been established, namely ineffective airway clearance, ineffective airway clearance is associated with airway hypersecretion, the nursing interventions that are arranged are airway management as the main intervention and

aromatherapy as a supporting intervention tailored to the patient's condition according to the patient's condition. PPNI (2018) in the Indonesian nursing intervention standard.

Nursing interventions that will be carried out focus on providing *peppermint aromatherapy inhalation* for well-being as researchers Zhao et al. (2022) state that the provision of *peppermint aromatherapy inhalation* can be done in patients with respiratory system disorders because it contains non-essential components, including respiratory system disorders because it contains non-essential components such as steroids, flavonoids, triterpenoids, phenolic acids and essential oils. Peppermint essential oil consists of menthol, menthone, neomenthol, and isomentone which can reduce problems in the respiratory system. Supporting research research was also conducted by Akram et al. (2022) stated that the content in peppermint such as menthol acetate, limonene and others can be used in problems related to the respiratory system. So it can be used in problems related to the digestive system and respiratory system.

Supportive nursing interventions to make it easier for patients to expel phlegm are effective cough training. This is in accordance with Suryarinilsih, Netti & Budi (2023) who stated that the application of effective cough techniques can have a significant effect in helping patients expel phlegm and minimize the energy expended due to persistent coughing. Other supporting research was conducted by Richard, Ariyanto & Setiawan (2022) who stated that training in effective cough techniques can be carried out in patients with tuberculosis with phlegm cough to help expel phlegm. The results of his research also showed a change in the condition of patients who were able to expel phlegm.

Nursing Implementation

The application of *peppermint aromatherapy inhalation* was carried out for three days three times with a difference of 2-3 hours in the morning, afternoon, and evening. This is in accordance with Sundari, Fitri & Purwono (2021) who carried out three times for three consecutive days. However, the time determined varies due to the patient's readiness to take action, so that nursing implementation is carried out by making a time contract in advance with the patient.

The purpose of timing the administration of aromatherapy inhalation was to provide a difference in the time of consumption of the patient's medication, which was in the morning and before the administration of the medication in the afternoon. However, the researcher justified this based on the patient's decision.

The implementation focused on the administration of peppermint essential oil. The essential oil used in this study is peppermint, which contains menthol aroma and shows anti-bacterial and anti-viral properties and antitussive effects. Anti-bacterial and anti-viral properties and antitussive effects that can provide a relaxing and anti-inflammatory effect

and inhibit airway hypersecretion. Airway hypersecretion, thus alleviating the patient's respiratory status.

This research was carried out by Aprilliawati et al. (2019) who applied peppermint essential oil in overcoming the ineffectiveness of airway clearance obtained the results of an increase in airway clearance in both patients.

Research conducted by Butar-Butar & Sitepu (2023) by applying aromatherapy inhalation to 29 respondents. application of inhalation aromatherapy to 29 respondents and obtained the results of a decrease in the degree of shortness of breath from severe degree to mild degree as many as 16 respondents. Other supporting research was also conducted by Sundari, Fitri & Purwono (2021) who found a decrease in respiratory frequency after three days of action, namely from 30x/min to 24x/min and obtained the results of sputum discharge. the first day the patient did not cough and the next day came out a slightly whitish white color. Supportive implementation is teaching effective coughing techniques. The result of this implementation was that patient 1 and patient 2 were cooperative during the action and were able to repeat it without being given directions. This is In line with research conducted by Ningsih & Novitasari (2023) which states that effective cough techniques aim to remove phlegm safely and completely, so that patients can reduce the level of energy used to cough, reduce the fatigue response due to shortness of breath and coughing. . In addition, from the results of research conducted on pulmonary tuberculosis patients by applying effective cough techniques, the results obtained increased saturation values on the first day 94% to 96% on the last day and decreased respiratory frequency on the first day. 31x/minute to 26x/minute on the last day. Other supporting research conducted by Sholehah (2022) states that the application of effective cough training in Pulmonary Tuberculosis patients can help remove sputum as evidenced by patient 1 and patient 2 being able to cough effectively. It is proven that patient 1 and patient 2 are able to cough effectively, remove and remove thick green sputum.

Nursing Evaluation

This study found that after the application of *peppermint aromatherapy* inhalation in patient 1 and patient 2 which was carried out for three consecutive days three times, measurements of respiratory frequency and dyspnea decreased. Patient 1 on the first day of action was 28x/minute and the last day was 20x/minute, while patient 2 on the first day of action was 29x/minute and the last day was 25x/minute. This is in accordance with research conducted by Sundari, Fitri & Purwono (2021) which states that there is a decrease in respiratory frequency after *inhalation of peppermint aromatherapy* for three consecutive days three times a day. For three consecutive days three times a day carried out on one patient with an RR of 30x/minute on the first day and 24x/minute on the last day. However, there was a gap in patient 2 who experienced an insignificant decrease in respiratory frequency and

dyspnea. This was characterized by severe shortness of breath that interfered with patient 2's activities to the point of feeling short of breath when changing clothes.

This study also showed a decrease in sputum. Patient 1 showed a decrease in sputum characterized by a reduced sensation of sputum in the throat and the patient's ability to cough and sputum discharge when coughing, while patient 2 showed a decrease in sputum characterized by sputum discharge after each coughing action and the absence of sputum at least on the last day. The difference in the reduction of sputum production in patient 1 was more difficult than in patient 2, because patient 2 received acetylcysteine drug therapy which plays a role in diluting excess sputum. So, patient 2 on the first day of action is easy to remove sputum after action compared to patient 1. Research conducted by Fatikatin (2023) obtained the results of one of the three patients in her study experiencing a significant decrease in sputum compared to patient 1. The other two patients who still spit out thick yellow sputum. Three consecutive days of action resulted in a decrease in additional ronchi breath sounds. During the three days of action, ronchi was still heard, but the sound of ronchi decreased marked by a fainter sound than at the time of examination. Research conducted by Fatikatin (2023) found that two of the three patients still experienced problems of ineffective airway clearance characterized by the sound of ronchi even though *peppermint aromatherapy* had been given.

Conclusion

This study showed that after administering *peppermint aromatherapy* inhalation to patient 1 and patient 2 for three consecutive days, the patients' respiratory frequency was measured, dyspnea decreased and this study also showed a decrease in sputum. Patient 1 first day action 28x/min and the last day 20x/min, while patient 2 the first day of action 29x/min and the last day 25x/min.

Reference

Abdurrosidi, & Novitasari, D. (2022). Nursing Care with Airway Clearance Oxygenation Disorders is Ineffective in Pulmonary TB Patients. *Journal of Nursing Management* Vol. 1, No. 4, 125-132. Accessed from: <https://www.oaj.sciprofoundation.co.id/index.php/jmn/article/view/68>

Akram M., et al. (2022). A Review on "Plants Essential Oils for the Management of Respiratory Diseases". *Biomedical Journal of Scientific and Technical Research*. Volume 41, Issue 3, 32653-32657. Accessed from: https://www.researchgate.net/publication/358150491_A_Review_on_Plants_Essential_Oils_for_t

- [he_Management_of_Respiratory_Diseases](#)
- Amelia, S., Octorina, R., & Astuti, N. (2018). Peppermint Aromatherapy Against the Nursing Problem of Ineffective Airway Clearance in Children with Bronchopneumonia. *Real in Nursing Journal* Vol. 1, No. 2, 77-83. Accessed from: <https://ojs.fdk.ac.id/index.php/Nursing/article/view/266>
- Anggreni, D. (2022). *Textbook of Health Research Methodology*. Mojokerto: STIKes Majapahit Mojokerto
- Aprilliawati, D., et al. (2019). Efforts to Increase the Ineffectiveness of Airway Clearance through Inhalation of Peppermint Aromatherapy in Tuberculosis Sufferers. Surakarta: ITS PKU Muhammadiyah Surakarta. Accessed from: <http://repository.itspku.ac.id/139/>
- Feather, M. W., et al. (2023). Combination Of Semi Fowler Position, Pursed Lips Breathing And Mint's Aromatherapy To Dyspnea In Pulmonary Tb. *Journal Well Being* Volume 8 No. 1, 55-67. Accessed from: <https://journal.stikes-bu.ac.id/index.php/wb/article/view/196>
- Butar-Butar, M. L., & Sitepu, S. A. (2023). The Effect of Simple Inhalation Using Aromatherapy Mint Leaves (Mentha Piperita) on Reducing Shortness of Breath in Pulmonary Tuberculosis Patients at the Pon Village Health Center, Sei Bamban District, 2019. *Deli Sumatra Health Journal*. Volume 1 Number 1, 1-7. Accessed from <https://jurnal.unds.ac.id/index.php/ksds/article/view/168>.
- Fatikatin, A. D. (2023). Analysis of the Application of Peppermint Oil Interventions in Tuberculosis Patients with Airway Clearance Problems at Rsud Ibnu Sina Gresik (Doctoral Dissertation). Accessed from: <https://repositori.ubs-ppni.ac.id/handle/123456789/170>
- Fatikatin, A. D. (2023). Analysis of the Application of Peppermint Oil Intervention in Tuberculosis Patients with Airway Clearance Problems at Ibnu Sina Hospital Gresik (Doctoral Dissertation). Accessed from: <https://repositori.ubs-ppni.ac.id/handle/123456789/175>
- Haerianti, M., et al. (2023). *Nursing Methodology*. Padang: CV Getpress Indonesia
- Hutabarat, V., Sitepu, S. A., & Sinambela, M. (2019). The Effect of Simple Inhalation Using Aromatherapy Mint Leaves (Mentha Piperita) on Reducing Shortness of Breath in Pulmonary

- Tuberculosis Patients at Community Health Centers. *Journal of Midwifery & Health Research* Vol.2 No. 1, 11-16. <https://ejournal.delihusada.ac.id/index.php/JPK2R/article/view/101>
- Ichsan, M., et al. (2022). Literature Review: Daunt Mint Aromatherapy is Effective in Reducing Shortness of Breath in Pulmonary TB Patients. *Madago Nursing Journal* Vol. 3 No. 2, 35-42. Accessed from: <https://www.poltekkespalu.ac.id/jurnal/index.php/MNJ/article/view/1091>
- Irwan. (2017). *Epidemiology of Infectious Diseases*. Yogyakarta: CV. Absolute Media.
- Isnaini, M. (2023). Community Nursing Care with the Problem of Medication Non-Compliance in Pulmonary TB Patients in Punaga Hamlet, Maradekaya Village, District. Bajeng District. Gowa. *Malahayati Nursing Journal* Volume 5 Number 10, 3347-3360. Accessed from: <https://ejournalmalahayati.ac.id/index.php/manuju/article/view/11300>
- Ministry of Health. (2018). Main Results of RISKESDAS 2018. Accessed from: https://kesmas.kemkes.go.id/assets/upload/dir_519d41d8cd98foo/files/Hasil-risikesdas-2018_1274.pdf
- Ministry of Health (2022). Effective Cough Techniques and Correct Cough Etiquette. Accessed from [yankes.kemkes: https://yankes.kemkes.go.id/view](https://yankes.kemkes.go.id/view).
- Ningsih, S., & Novitasari, D. (2023). Effectiveness: Coughing is effective in Pulmonary Tuberculosis Sufferers. *Journal of Professional Nursing Research*, 5(3), 983-990. <https://doi.org/10.37287/jppp.v5i3.165>
- Richard S. D., Ariyanto H. & Setiawan H. (2022). Implementation of Evidence-Based Nursing for Expelling Sputum in Tuberculosis Patients with Chest Physiotherapy and Effective Coughing Exercises: A Case Study. *International Journal of Nursing and Health Services*. Volume 5, Issue 3, 259-266. <https://www.ijnhs.net/index.php/ijnhs/article/view/596>
- Suryarinisih Y., Netti & Budi H. (2023). Deep Breathing and Coughing Techniques are Effective for Airway Clearance in Patients with Pulmonary Tuberculosis. *International Journal of Current Science Research Review*. Volume 06, Issue 04, 22346-2351. Accessed from:

- <https://ijcsrr.org/single-view/?id=9942&pid=9853>
- WHO. (2022). TB day 2022. Retrieved December 21, 2023, Accessed from <https://www.who.int/indonesia/news/campaign/tb-day-2022/fact-sheets>
- Williams, N. (2017). The MRC breathlessness scale. Occupational Medicine Volume 67 Issue 6,496-497. Accessed from: <https://academic.oup.com/occm/article/67/6/496/4095219>
- Zhao H. et al. (2022). Peppermint Essential Oil: its Phytochemistry, Biological Activity, Pharmacological Effect and Application. Biomedicine & Pharmacotherapy. Volume 154.