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The implementation of foot reflection massage therapy of nursing care on the quality of sleep patterns in pulmonary tb patients

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Abstract

Aims: Evaluating the effectiveness of foot reflexology massage therapy on sleep patterns in Pulmonary Tuberculosis patients at Royal Prima Hospital.

Study design: The design used was a quasi experiment with a case study. The sample in this study was 1 patient. Criteria: Patients are treated for no more than 2 days in the inpatient room. Data collection methods included interviews, observation, and documentation.

Place and Duration of Study: Royal Prima Hospital and 1 month

Methodology: Quantitative

Results: the foot reflexology intervention and the results criteria that have been previously prepared, the nursing problem in diagnosing sleep pattern disorders related to lack of sleep control can be resolved

Conclusion: sleep pattern disorders related to the lack of sleep control can be resolved.

Keywords: foot reflection; massage; nursing care; quality of sleep; TB.

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Introduction

Pulmonary Tuberculosis (pulmonary TB) is an infectious disease caused by the airborne pathogen *Mycobacterium tuberculosis* and is a leading cause of death [1]. The transmission of *Mycobacterium tuberculosis* (Mtb) occurs through the aerosol transmission, and the primary site of colonisation is within the pulmonary region of the body [2]. Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis* and is the second leading cause of

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infectious death worldwide. It is a well-known fact that the prevalence of pulmonary tuberculosis is high in patients with type 2 diabetes mellitus (T2DM) [3].

The Global Tuberculosis Report provides a comprehensive and up-to-date assessment of the TB epidemic and progress in prevention, diagnosis, and treatment of the disease, at global, regional and country levels. This is effectuated in the context of global TB commitments, strategies, and targets. The 2022 edition of the report is, as usual, based primarily on data collected by WHO from national health ministries in annual data collection rounds. In 2022, 202 countries and territories with more than 99% of the world's population and TB cases reported data [4].

By 2022, it is estimated that 700,000 individuals with tuberculosis (TB) were diagnosed in Indonesia. This figure is the highest figure since TB became a national priority program. Tuberculosis (TB) in Indonesia is ranked third after India and China, with 824 thousand cases and 93 thousand deaths per year or the equivalent of 11 deaths per hour. In Indonesia, the highest number of TB cases is in the productive age group, especially those aged 45 to 54 years.

The success rate for treating drug-sensitive TB in Indonesia in 2022 was 85%. Meanwhile, the success rate for treating drug-resistant TB in Indonesia in 2022 generally was 55%. In the National TB Elimination Strategy contained in Presidential Decree number 67 of 2021 concerning Tuberculosis Management, Indonesia has implemented various strategies to combat TB. Starting from strengthening commitment, increasing the access to TB services, optimising TB promotion and prevention efforts, TB treatment and infection control, then utilising research and technology results [5].

The lung disease generally has symptoms of shortness of breath, coughing and chest pain which can disrupt the patient's sleep quality. The lung disease in nursing care can cause nursing problems in the form of ineffective breathing patterns. Ineffective breathing pattern is a condition where inspiration and/or expiration do not provide adequate ventilation. In the Indonesian Nursing Diagnosis Standards, ineffective breathing patterns are included in the physiological category with the respiratory subcategory. Based on the formulation of nursing diagnoses according to the IDHS using the problem, aetiology, sign and symptom (PES) format [6].

Resting at night is crucial during the healing process of an illness. As a nurse, it is important to provide interventions that can improve the patient's sleep quality with pharmacological and non-pharmacological therapy. Relaxation techniques improved the sleep quality by 0-38%, interventions to improve the sleep hygiene or reduce the sleep interruptions improved the sleep quality by 5%, and daytime exposure to bright light Improved the sleep quality by 7-18% [7].

The relationship between depression and sleep is strongly interconnected, with each having a significant impact on the other. Safer and more effective treatments, i.e., non-pharmacological interventions, are urgently needed to improve the sleep quality and depression severity in depressed patients [8]. Interventional massage therapy involves massaging the hands, back, and feet to improve the sleep quality in patients with heart failure, pain, and environmental issues [9]. The prevalence of poor sleepers and those at risk for restless legs syndrome is higher than in the general population, making it important to assess the sleep quality in patients diagnosed with tuberculosis. The prevalence of people at risk of excessive daytime sleepiness was like that in the general population [10].

The interview findings indicated that a considerable number of individuals suffering from hypertension were uninformed about the potential of reflexology massage in lowering blood pressure. Additionally, some interviewees had previously tried reflexology massage for this purpose but eventually discontinued it. This could include emphasising the limited research on non-pharmacological interventions on sleep quality in pulmonary TB patients and how foot reflexology addresses this gap. Building upon the given background, the author aims to investigate the potential benefits of incorporating foot reflexology massage therapy into the nursing care for pulmonary TB patients at Royal Prima General Hospital, specifically focusing on its impact on improving the quality of sleep patterns.

The influence of therapeutic touch, relaxation, placebo effects, and similarities with other treatments of structural manipulation are considered. The lack of clarity regarding the precise definition of reflexology and the challenges in exploring this therapy as a treatment tailored to individual needs is discussed [11].

Research Problem

A comprehensive study highlights the issues encountered by individuals suffering from sleep disorders, especially TB patient, require appropriate treatment or attitudes to overcome them because they can affect the recovery rate.

Research Focus

Elderly people who experience sleep disorders, especially TB patient that were hospitalised at Royal Prima Hospital. This population was selected because it is highly relevant to the study of sleeping disorders and is closely associated with nocturnal coughing.

Research Aim and Research Questions

This study aimed to determine the effect of foot reflexology massage therapy nursing care to the quality of sleep patterns in pulmonary TB patient at Royal Prima Hospital. Is there any effect of foot reflexology massage therapy nursing care to the quality of sleep patterns in pulmonary TB patient?

Case Presentation

General Background

This quasi-experimental study was conducted in 2023 in the Royal Prima Hospital, Medan, North Sumatera. The respondent was a TB Patient who voluntarily declared his participation. As a result, informed consent was obtained from the individual involved in the study.

Sample / Participants / Group

A patient who has been admitted to Royal Prima Hospital. This patient is managing tuberculosis. The criteria for admittance included being diagnosed with tuberculosis, having a sleeping disorder, being conscious, as well as being either a new patient or someone who has received treatment for no longer than two days.

Instrument and Procedures

The measuring instruments were the interview, observation, and documentation. The interview included Client identity including the name, age, gender, education, address, occupation, religion, date and time of hospital admission, and medical diagnosis. The main complaint was often the reason clients asked for health assistance. Observations on patients aimed to gather essential data for researchers to support the completion of their final assignment. These observations involved a thorough physical examination of the patient, following the head-to-toe principle. Healthcare professionals utilised various observation techniques and instruments such as stethoscopes, sphygmomanometers, thermometers, spatulas, and renal streams to collect the required information. The research used document studies showing pulmonary TB by looking at the results of medical records, laboratory examinations and X-ray examination results in patients who had received permission.

This study used Reflexology foot Therapy Procedure Work Phase [12]: 1) Wash your hands; 2) Kindly ask the client to wash their hands and feet beforehand; 3) Gently dry the client's feet; 4) Position the client in the most comfortable way possible; 5) Take a sufficient amount of baby oil and apply it to the nurse's hands and the soles of her feet; 6) Using your thumb, press the foot reflexology therapy point or zone from bottom to top; 7) Use the tip of your fist to press the foot reflexology therapy point or zone; 8) Massage the reflex point of the inner toes using your thumb and forefinger; 9) Massage the reflex point of the outer toes using your thumb and forefinger; 10) Massage the reflex point of the tips of the toes using your thumb and forefinger; 11) Press the foot reflexology therapy point or zone with the bottom of your fist and gently rotate it.

Sleep disorder with criteria, Subjective: 1) The client complains of sleep disorders, 2) The client complains of frequently waking up, 3) The client complains of dissatisfaction with sleep, 4) The client complains that the sleep pattern has changed, 4) The client complains of not getting enough rest, 5) The client complains of decreased activity ability. Objective: 1) The sleep quality decreases, 2) The client looks sleepy, 3) The client doesn't look fresh.

Data Analysis

There are four ways to analyse data: validating data and observations, recognizing patterns or groupings, making conclusions, and presenting results in detail and separate from other studies. Nursing assessments include client identity, which includes name, age, gender, education, address, occupation, religion, date and time of hospital admission, and medical diagnosis. The main complaint is usually the reason why clients seek health assistance.

The data collection methods used were: 1) Interview: the client identity included the name, age, gender, education, address, occupation, religion, date and time of hospital admission, and medical diagnosis. The main complaint was often the reason clients ask for health assistance, 2) Observation: the observations on patients aimed to obtain the data needed by researchers. The observations were carried out by physically examining the patient using the head-to-toe principle. The observation techniques were used using instruments such as stethoscopes, tension meters, thermometers, spatulas, and bends, 3) Documentation: the research used document studies showing pulmonary TB by looking at the results of medical records, laboratory examinations and X-ray examination results in patients who had received permission.

Assessment

Based on data obtained during an assessment on June 10 2023 of the patient Mrs. A, the patient, a 72-year-old female, currently worked as a trader.

The Chief Complaint

The patient reports that she is coughing up thick white mucus. She also experiences a decreased appetite and feels weak while eating. Additionally, she struggles with sleeping at night and has irregular sleep patterns. The patient feels short of breath, especially when the mucus builds up in her throat, and experiences chest pain. She mentions that these symptoms are interfering with her daily activities. The patient adds that she has been dealing with this cough and mucus for 1 month.

Objective data: the patient looked weak, compos mentis consciousness, GCS score 15 (M=6, E=4, V=5) appeared to be lying in a semi-fowler's position, had an IV in the right hand, NaCl (Sodium Chloride) 20 drops per minute, and was installed breathing mask 7 liters. Body weight before illness was 60 kg after treatment was 52 kg. BP: 110/90 mmHg; RR: 26x/m; HR: 102x/m; T: 36.2°C; SPO2: 85%.

Nursing Diagnosis

The diagnosis that emerged for Mrs. the primary concern was sleep pattern disorders caused by a lack of control oversleep.

Nursing Intervention

The nursing plan was prepared on June 10, 2023, namely after an assessment and diagnosis was carried out. Nursing actions are carried out based on SIKI (sleep support), observation, identification of activity and sleep patterns, identification of factors that disrupt the sleep (physical or psychological), identification of food and drink that disrupt the sleep, identification of sleeping medication consumed. Therapeutic Modify the environment (eg. lighting, noise, temperature, mattress and bed), Limit nap time, if necessary, Procedures to increase comfort (e.g. massage, position adjustment, acupressure therapy), Facilitate stress relief, appropriate administration medications and measures to support the sleep-wake cycle. Education Explain the meaning of getting enough sleep during illness, encourage adhering to bedtime habits. Suggest avoiding foods that disrupt sleep and teach factors that contribute to sleep pattern disturbances (eg. psychology, lifestyle, changing work shifts). Teach autogenetic muscle relaxation or non-pharmacological methods.

Nursing Implementation

Nursing actions were carried out from June 10 2023 to June 12 2023, the first nursing implementation was carried out on patients, namely identifying activity and sleep patterns with results: the patient's sleep pattern was 3-5 hours/day; carried out a procedure to increase comfort with foot reflexology massage with results: the client stated that he was comfortable because he was given relaxation therapy but the client always woke up in the middle of the night; modifying the environment (noise, limiting visitors) with results: the family understands and responds well, the client can rest well.

The second implementation was carried out on June 11 2023, namely identifying activity and sleep patterns with results: the client's sleep pattern was 4-6 hours/day; Carrying out a procedure to increase comfort with foot reflexology massage with results: the client stated that he was uncomfortable because he was given relaxation therapy but the client always woke up in the middle of the night; Modifying the environment (noise, limiting visitors) with Results: the family understands and responds well, the client can rest well; Limiting nap time with Results: the client accepts advice from the nurse; Encourage daily physical activity with results: the client will do physical activity.

The third implementation was carried out on June 12, 2023, namely identifying activity and sleep patterns with results: the client's sleep pattern was 4-6 hours/day; (Table 1; Figure 1).

Table 1. The quality of sleep patterns

Quality of sleep patterns	3-5 hours/day	4-6 hours/day
First day	1	0
Second day	0	1
Third day	0	1



Figure 1. The quality of sleep patterns

Carrying out a procedure to increase the comfort with foot reflexology massage with results: the client stated that he was uncomfortable because he was given relaxation therapy but the client always woke up in the middle of the night; Modifying the environment (noise, limiting visitors) with Results: the family understands and responds well, the client can rest well; Limiting nap time with Results: the client accepts advice from the nurse; Encourage daily physical activity with results: the client will do physical activity (Table 2; Figure 2).

Table 2. Daily physical activity

Daily physical activity	Active	Passive
First day	1	0
Second day	0	1
Third day	0	1

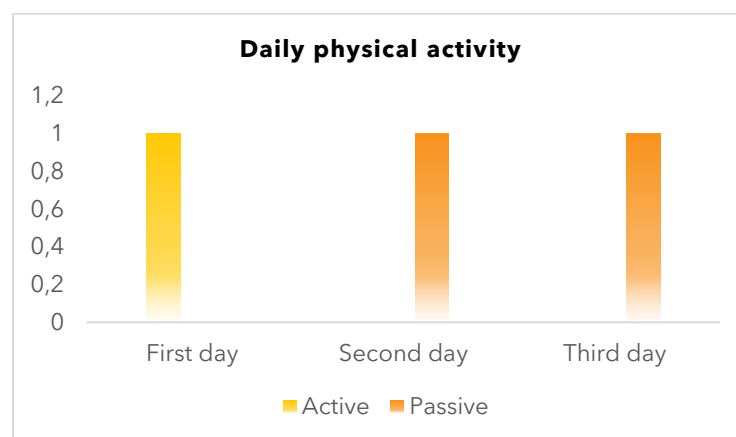


Figure 2. Daily physical activity

Discussion

Based on data obtained during an assessment on June 10, 2023, of the patient Mrs. A, a 72 years old patient, female that worked as a trader. In a theoretical review, it was stated that pulmonary TB disease was also often found in people from middle to lower economic groups and whose types of work are in environments that are exposed to a lot of air pollution.

The nursing diagnoses were based on data analysis according to priorities (SDKI DPP PPNI Working Group Team) [6], namely disturbed sleep patterns related to lack of sleep control. In the theoretical review and case research, there were general similarities, but each intervention still referred to the targets, data and outcome criteria that have been determined. The following interventions have been prepared according to the SDKI (SDKI DPP PPNI Working Group Team) [6], SLKI (DPP PPNI SLKI Working Group Team) [13], and SIKI (SIKI DPP PPNI Working Group Team) [14] by adjusting the case review.

It was expected that sleep pattern disturbances will decrease after implementing nursing interventions for three consecutive days and nights: Complaints of difficulty sleeping will decrease, Complaints of frequently waking up, Complaints of dissatisfaction with sleep, Complaints of not getting enough rest will decrease and Ability to do activities will improve with action in accordance with SDKI (2017), SLKI (2019) and SIKI (2018). The sleep support was carried out through various actions: Observations were carried out by identifying activity and sleep patterns, identifying factors that disturb sleep (physical or psychological), identifying foods and drinks that disturb sleep, and identifying the consumed sleeping pills; Therapeutic is carried out by modifying the environment (e.g. lighting, noise, temperature, mattress and bed), limiting nap time, if necessary, carrying out procedures to increase comfort (e.g. massage, positioning, acupressure therapy), facilitating stress relief and Appropriate administration of medications and measures to support the sleep-wake cycle;

Education aims to guide individuals in understanding the importance of getting sufficient sleep during illness by providing explanations. It encourages individuals to adhere to healthy sleep habits, emphasizes the avoidance of foods that can disrupt sleep, and educates on the various factors that contribute to sleep pattern disorders (e.g. psychology, lifestyle, changing work shifts and teaching autogenetic muscle relaxation or non-pharmacological method, SIKI (2018) [14]. In this case there was no gap between facts and theory because the nursing intervention for case review was carried out in accordance with theory.

Implementation in theoretical reviews only discusses the theory of nursing care and actions in case reviews of implementation that are realised directly with clients accompanied by documentation of actions from nursing

interventions on nursing diagnoses. Sleep pattern disorders related to lack of sleep control, all nursing interventions have been carried out for 3 days, namely:

On the first day, June 10 2023, nursing intervention was carried out with actions, namely: identifying the activity and sleep patterns with the result of the client's sleep pattern being 3-5 hours/day, carrying out procedures to increase comfort with foot reflexology massage with the result that the client stated that he was comfortable because given relaxation therapy but the client always wakes up in the middle of the night and modifies the environment (noise, limiting visitors) with the result that the family understands and responds well, the client can rest well.

On the third day, June 11 2023, a nursing intervention was carried out with actions, namely: identifying activity and sleep patterns with the results of the client's sleep pattern being 4-6 hours/day, carrying out procedures to increase the comfort with foot reflexology massage with the results of the client stating that he was comfortable. because relaxation therapy was given but the client always woke up in the middle of the night, modified the environment (noise, limiting visitors) with the result that the family understood and responded well, the client was able to rest well, limited nap time with the result that the client accepted advice from the nurse and recommended daily physical activity -day with the result that the client will do physical activity.

Critical reflection on research limitations and potential for future research. The limitations of this study include the use of a single research sample and the challenges encountered during nursing interventions and data collection. As a result, the findings cannot be generalised to other contexts, as they are specific to the unique circumstances in which the research was conducted. Additionally, consider addressing unexpected outcomes or factors that may have influenced the results. Providing a clear reflection regarding the limitations of the study will further contribute to the comprehensiveness of nursing interventions in improving the sleep patterns among pulmonary TB patients.

On the fourth day, June 12 2023, a nursing intervention was carried out with actions, namely: identifying the activity and sleep patterns with the result of the client's sleep pattern being 4-6 hours/day, carrying out procedures to increase comfort with foot reflexology massage with the results of the client stating that he was comfortable. because relaxation therapy was given but the client always woke up in the middle of the night, modified the environment (noise, limiting visitors) with the result that the family understood and responded well, the client was able to rest well, limited nap time with the result that the client accepted advice from the nurse, encouraged daily physical activity -day with the results the client will do physical activities.

After implementing 3 actions, the development notes obtained on the last day of evaluation were as follows: Disturbance in sleep patterns related to the lack of sleep control. The evaluation carried out on Mrs. An obtained subject data: The client reported that her sleep pattern had improved and Klein said her rest had not improved enough, objective data: The client said she was still waking up in the middle of the night decreased, the client's sleep quality was still improving, the client's amount of sleep was 6-7 hours/ day, the client said he was no longer sleepy during the day and the client didn't seem fresher or better. After acting in accordance with the intervention and outcome criteria that have been prepared previously, the nursing problem in this diagnosis can be resolved.

Massage interventions enable nurses to propose and implement strategies aimed at enhancing sleep quality in critically ill patients [15]. These methods can be used as appropriate complementary treatments by nurses and midwives to improve sleep quality.

Conclusions and Implications

The findings from the study on nursing care for clients with "Application of Foot Reflexology Massage Therapy Nursing Care on the Quality of Sleep Patterns in Pulmonary TB Patients at RSU Royal Prima" suggest that the client reported experiencing frequent night-time awakenings, daytime sleepiness, and overall fatigue. After acting according to the interventions that had been carried out to overcome the problem of sleep pattern disorders, it was found that the sleep quality increased from 3-5 hours per day to 4-6 hours per day. The client reported that her sleep pattern had improved, and her rest was starting to improve. The nursing problems related to the sleep pattern disorders related to the lack of sleep control can be properly resolved.

The sleep is a normal activity experienced by all individuals thus making sleep a human activity in life daily. These activities are considered simple activities which do not require special attention. Quality sleep is waking up feeling refreshed and ready to tackle the challenges of each day with renewed energy. This idea combines several attributes, for example, time what is needed to start falling asleep, the depth of rest and calm. Sleep quality is considered to have an important role in physical condition or a person's mental state. This is based on the function of sleep itself, where you sleepy It is believed to allow the body to restore or rest its physical condition used after a day of activities, reduces stress and anxiety, and Increase concentration power when carrying out daily activities. Sleep involves physiological processes managed by the nervous system integrated centre. Specific physiological responses and patterns of brain activity identify each process. Sleep disorders are conditions that, if left untreated, are common will cause sleep disturbances at night resulting in the appearance of one of the following three problems: insomnia;

movement or sensation abnormality during sleep or when awake in the middle of the night; or feeling sleepy which is excessive during the day.

The quality of sleep is determined by how a person prepares for their sleep patterns at night, including factors such as the depth of sleep and the ability to fall asleep without the use of medication. Good quality sleep can lead to a feeling of calm in the morning and a lack of sleepiness. It is crucial for everyone's health to have good quality sleep, as poor sleep can disrupt the body's sleep-wake cycle, impact brain function, and result in various health issues. Sleep quality describes a person's ability to maintain a consistent sleep schedule and avoid disturbances during sleep. Many factors can influence sleep quality, such as illnesses, environmental conditions like noise and light, physical activity and fatigue, mental stress, medications and substances consumed, and caffeine intake. Perceptions of sleep quality can vary greatly and are individualised, which can be influenced by the amount of time spent sleeping and the efficiency of sleep.

One of therapy to improve sleep quality, namely with the provision of foot massage starting from foot massage and ending with Massage the soles of the feet so they respond foot nerve sensors. Foot massage is one method that most effective of complementary therapies because when the patient is given a foot. Massage has a relaxing effect that is felt patient so that the patient feels comfortable and easy to fall asleep. Selection of foot massage as interventions used in critical patients because the feet are easily accessible, the patient is not need to be repositioned so it won't affect the equipment used by the patient, is able to stimulate circulation blood circulation that can make the patient's mood becomes comfortable, relaxing, and has a positive influence so it will affect sleep quality patient.

Foot massage has been found to improve the blood circulation system by stimulating the nervous system and increasing muscle activity. This stimulation helps to relax the muscles, providing a comforting and sedative effect on the patient. As a result, foot massage can help promote relaxation and potentially aid in improving sleep patterns in patients with sleep disorders. This research supports the notion that foot reflexology therapy can be an effective and beneficial treatment for individuals experiencing sleep pattern disorders.

Declarations

Author Contributions

The following statements should be used:

Conceptualization, Mirna Gea and Elis Anggeria; methodology, Mirna Gea; software, Elis Anggeria; validation, Elis Anggeria, Devi Ardila and Rahmaini Fitri Harahap; formal analysis, Elis Anggeria; investigation, Mirna Gea; resources, Elis Anggeria and Devi Ardila; data curation, Elis Anggeria; writing—original draft preparation, Elis Anggeria; writing—review and editing, Elis Anggeria and Devi Ardila; visualization, Eka Isranil Laily; supervision, Devi Ardila; project administration, Rini Elvira Hutabarat; funding acquisition, Patimah Sari Siregar. All authors have read and agreed to the published version of the manuscript.

Data Availability Statement

Below are suggested Data Availability Statements (Please select one of them).

- Data sharing not applicable: No new data were created or analyzed in this study. Data sharing is not applicable to this article.

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Institutional Review Board Statement

Declared to be ethically appropriate in accordance with 7 (seven) WHO 2011 Standards, 1) Social Values, 2) Scientific Values, 3) Equitable Assessment and Benefits, 4) Risks, 5) Persuasion/Exploitation, 6) Confidentiality and Privacy, and 7) Informed Consent, referring to the 2016 CIOMS Guidelines. This is as indicated by the fulfillment of the indicators of each standard. Ethics Certificate of Universitas Prima Indonesia Number: 084/KEPK/UNPRI/X/2023.

Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Conflicts of Interest

The author declares that there is no conflict of interests regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the authors.

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