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Nursing Care for Dengue Hemorrhagic Fever Patients with Deep Breath Relaxation Intervention to Reduce Pain

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Abstract:
Dengue fever or hemorrhagic fever is an acute infectious disease that can be transmitted by the Aedes aegypti mosquito. The virus carried by the Aedes aegypti mosquito will attack cells in the liver, disrupting liver function and causing swelling and bleeding. Symptoms that can occur are high fever, muscle and joint pain, and rash. One of the nonpharmacological therapies is deep breath relaxation therapy to reduce pain. This study aims to analyze deep breath relaxation techniques to reduce pain. This research design used a case report approach. The pain can decrease after being given deep breath relaxation therapy for 3 days. On the first day, on a scale of 7, it decreased to a scale of 2 on the third day of hospitalization. Applying deep breath relaxation techniques can help reduce pain intensity by relaxing skeletal muscles that experience spasms due to increased prostaglandins, so that vasodilation of blood vessels will increase blood flow that is spasmed and ischemic. This technique can help a person or patient control themselves when feeling emotional discomfort, physical stress, or pain. Deep breath relaxation techniques can be given to patients who experience pain as a nonpharmacological therapy. The application of this relaxation technique is proven to reduce pain intensity.

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INTRODUCTION

Dengue Hemorrhagic Fever (DHF) is an acute, mosquito-borne viral illness caused by the dengue virus, a member of the Flavivirus genus and the Flavivirus family (Dehghani & Kassiri, 2021). Transmitted primarily by the bite of infected female Aedes aegypti mosquitoes, DHF poses a significant global health challenge, particularly in tropical and subtropical regions (Patel et al., 2024; Asishe et al., 2024). Secondary vectors, including Aedes albopictus, Aedes scutellaris, and Aedes polynesiensis, further contribute to its widespread transmission. The disease's global burden is exacerbated by rapid urbanization, climate change, and limited access to healthcare in endemic areas, making DHF a critical public health concern, especially in developing countries (Garcia-Rejon et al., 2021).

The pathophysiology of DHF involves viral replication in host cells, particularly hepatocytes, leading to liver dysfunction, vascular permeability, and coagulopathy (Leowattana & Leowattana, 2021). This results in clinical manifestations such as high fever, severe myalgia, arthralgia, headache, nausea, vomiting, and characteristic skin rashes (Nasir et al., 2024; Aisyiah et al., 2021). In severe cases, plasma leakage, hemorrhagic complications, and organ failure may occur, culminating in life-threatening dengue shock syndrome (DSS). Early recognition of symptoms, such

as warning signs of hypotension and bleeding, is vital to prevent mortality (Singh et al., 2022; Latifah et al., 2024).

DHF progresses through three distinct phases: febrile, critical, and convalescent (Sivashangar et al., 2025). The febrile phase is marked by abrupt high-grade fever and systemic symptoms, while the critical phase, occurring 3–7 days post-onset, is characterized by plasma leakage and hemorrhagic manifestations (Pulock et al., 2025). The convalescent phase involves gradual recovery, though complications such as secondary infections or multiorgan dysfunction may arise. Effective management hinges on timely intervention, particularly during the critical phase, to mitigate risks of severe outcomes (De Almeida et al., 2024).

Current DHF management integrates supportive care, including fluid replacement, antipyretics, blood product transfusions, and nonpharmacological strategies to alleviate symptoms (Vidanapathirana, 2024; Aditya, 2023). Pharmacological interventions remain limited due to the risk of hepatotoxicity and thrombocytopenia, necessitating adjunctive therapies. Nonpharmacological approaches, such as music therapy, guided imagery, and relaxation techniques, have gained attention for their role in symptom management (Wu et al., 2022). Notably, deep breathing relaxation (DBR) has emerged as a promising intervention for pain relief, leveraging physiological mechanisms to reduce discomfort without adverse effects (Patel et al., 2024).

DBR alleviates pain by modulating the autonomic nervous system, promoting parasympathetic activation, and triggering endogenous endorphin release. This technique involves slow, controlled inhalation followed by prolonged exhalation, inducing skeletal muscle relaxation and reducing ischemic pain caused by vascular spasms (Joseph et al., 2022). DBR addresses pain's sensory and emotional dimensions by enhancing blood flow and counteracting sympathetic overactivity. Studies suggest that DBR interrupts pain pathways through descending inhibitory control, offering a holistic alternative to conventional analgesics in resource-limited settings (Gholamrezaei et al., 2022).

Empirical evidence underscores DBR’s efficacy in pain management across diverse clinical contexts (Joseph et al., 2022). In DHF, where pain from myalgia and hepatomegaly significantly impacts quality of life, DBR could serve as a low-cost, accessible intervention. Its integration into nursing protocols on integrative symptom management strategies in dengue care (Jeong et al., 2024).

This study aims to evaluate the effectiveness of DBR in reducing pain intensity among DHF patients, contributing evidence-based insights to nursing practice. By rigorously assessing DBR's role within multidisciplinary care frameworks, the research seeks to validate its utility as a first-line nonpharmacological intervention. Findings may inform standardized guidelines for DHF symptom management, empowering nurses to enhance patient comfort while minimizing reliance on pharmacological agents with potential side effects. Ultimately, this work bridges gaps in holistic dengue care, addressing a critical need in global tropical medicine.

STUDY DESIGN

The analysis method in the final scientific paper used a case report method utilizing a nursing process approach. The process consists of reviewing data from patients, families, and patient status sheets. After the assessment was carried out, the enforcement of nursing diagnosis using SDKI with data analysis was then compiled into SIKI, after which the implementation of nursing and nursing evaluation was carried out using documentation with SOAPIE. The location of this study was carried out in the Lavender Room of Dr. Soebandi Jember Hospital on April 16-18, 2024. The time of the research was when the patient was treated at Dr. Soebandi Hospital. This time has included nursing

assessment activities, data analysis, and determination of nursing diagnoses, preparation of interventions, implementation of actions, and nursing evaluation.

The respondents in this study were one respondent with a patient with dengue hemorrhagic fever who was willing to participate in the study to be given deep breath relaxation technique therapy. Respondents agreeing to participate will be given an informed consent sheet with the ethical principles of autonomy, confidentiality, justice, and usefulness. Primary data in this study were obtained directly from the subjects or respondents through anamnesis, namely the patient's identity, current health history, and past health. Secondary data in this study were obtained from medical records. The instrument in this study uses the standard operating procedure (SOP) of RSD dr. Soebandi Jember, namely the deep breath relaxation technique. In addition, pain can be measured using a numeric rating scale. The Faculty of Nursing, University of Jember provides nursing care. Researchers used a numeric rating scale to measure pain.

This research received formal ethical clearance from the Faculty of Nursing Ethics Committee, University of Jember. The study adhered to the ethical principles outlined in the Declaration of Helsinki and national guidelines for biomedical research involving human participants. Before data collection, informed consent was obtained from all participants or their guardians, ensuring voluntary participation, confidentiality, and the right to withdraw at any stage. The ethical review process also emphasized minimizing harm, maintaining procedural transparency, and safeguarding the dignity and well-being of patients with Dengue Hemorrhagic Fever (DHF). This approval underscores the study’s commitment to rigorous scientific integrity and ethical standards, ensuring the validity and credibility of findings while prioritizing patient safety and human rights.

PATIENT INFORMATION

The patient managed in this scientific paper is Mr. M, a 30-year-old man with a medical diagnosis of colic abdomen and dengue hemorrhagic fever grade II. The client works as a self-employed person and lives in Puger, Jember. The patient arrived at the emergency room of dr. Soebandi on April 16, 2024, at 09.50 with complaints of abdominal pain and nausea with an RR of 20x/min, vital signs of 149/95 mmHg, pulse 97x/min, SpO2 96%.Previously, the patient was taken to Balung Hospital and received pharmacological therapy, namely pain relief injections, after which the patient was referred to dr. Soebandi Jember Hospital. Patients complain of nausea and vomiting, decreased appetite, and abdominal pain for several days. The patient underwent a blood test at the emergency room with the results of bilirubin 0.80 mg/dL, hemoglobin 19.8 g/dL, monocytes 12, platelets 13,000 /uL, SGOT 386 U/L, and SGPT 215 U/L. The patient moved to the Lavender room on April 16, 2024.

CLINICAL FINDINGS

Researchers assessed patients complaining of abdominal and whole-body pain. The patient is said to have a history of acid reflux disease. In their lifestyle, they like to eat salty food. Rest and sleep, patients often stay up late. The patient's family history includes a history of hypertension. Mr. M's current condition is spontaneous breathing, blood pressure 139/90 mmHg, pulse 90 x/min, RR 20x/min, SpO2 98% no tightness. Regular heart rhythm, single S1 and S2 sounds, no additional heart sounds, warm acral, CRT <2 seconds, temperature 36.5 °C, consciousness GCS E4V5M6, pupils’ light reflexes: isochor, mental status as well as good speech ability. Currently, Mr. M has not defecated. Mr. M is strong in motion with a free range of motion (ROM), with a 500 ml NaCl infusion at a speed of 7 dpm in his right hand. Researchers perform PQRST Pain with the patient's results,

such as heartburn, which is described as stabbing pain in the abdomen, on a scale of 7 (using a numeric rating scale), with continuous pain intensity.

The researcher took three nursing diagnoses on Mr. M, namely acute pain (D.007), e.c. physiological warning agent, d.d. complained of pain, appeared grimacing. The second diagnosis is Nausea (D.0076) e.c. gastric irritation d.d. complaining of nausea and feeling a hot sensation. The third diagnosis is the risk of bleeding (D.0012) due to coagulation disorders.

THERAPEUTIC INTERVENTION

After determining the subsequent nursing diagnosis, the researcher determines the outcome criteria using the Indonesian Nursing Outcome Standard (SLKI) for each diagnosis. The researcher then provides intervention according to the Indonesian nursing intervention standards (SIKI).

In one of the interventions, the researcher applied Evidence-Based Nursing (EBN) to diagnose acute pain. The EBN used for acute pain diagnosis is the deep breath relaxation technique. In previous studies, the provision of deep breath relaxation technique therapy could help reduce pain intensity; seeing this, the researcher applied an intervention by providing deep breath relaxation techniques to reduce the pain experienced by patients.

The intervention is implemented before giving pharmacological drugs to patients. The administration is carried out for 3 days, and is carried out for 3-5 minutes a day, and is carried out 1 hour before the administration of nonpharmacological drugs. Before being given the implementation, the patient was explained the deep breath relaxation technique, the benefits of the deep breath relaxation technique, and how to do the deep breath relaxation technique. The patient listens and listens and is enthusiastic. After being given an example, the patient can do the deep breath relaxation technique. Patients can do deep breath relaxation when they feel pain, not only when they are with researchers, but sometimes patients do 2-3 deep breath relaxations independently. The following are the results of measurements carried out while the patient was treated in the Lavender room of dr. Soebandi Jember Hospital.

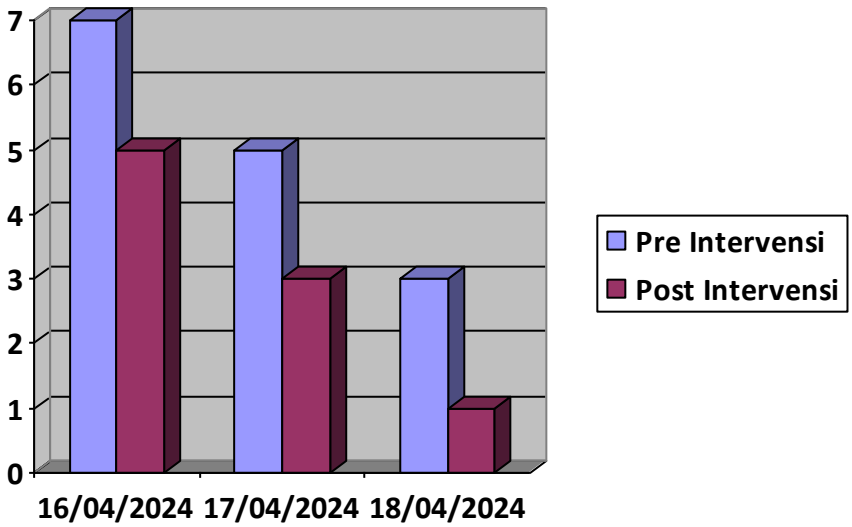

Diagram 1. The results of pain intensity measurement using the Numeric Rating Scale (NRS) before the intervention and 15 minutes after the intervention for 3 days.

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On the first to third day of the administration of deep breath relaxation techniques in patients managed with dengue hemorrhagic fever, the pain decreased from scale 7 to scale 1. So, the researchers concluded that the administration of deep breath relaxation techniques significantly reduced the intensity of pain in patients with abdominal colic with dengue hemorrhagic fever. On April 1, April 16, 2024, the patient will be informed about the actions or interventions that will be carried out to overcome pain, after which the researcher will ask for consent to become a respondent. The patient agreed to intervene, and the researcher explained the deep breath relaxation technique's definition, objectives, and benefits. The researcher taught the technique of deep breathing relaxation for approximately 5 minutes, after which the evaluation was conducted 15 minutes later. The intensity of the previous pain was at a scale of 7, decreasing to a scale of 5. This happened because the patient looked more relaxed than before.

On April 2 April 17, 2024, the implementation was carried out, and the patient was asked to do a deep breath relaxation for approximately 5 minutes. The evaluation was carried out 15 minutes after, and the result was that the pain intensity decreased from scale 5 to scale 3. On the third day, April 18, 2024, the implementation of patients can be done cooperatively, and after the implementation of breath relaxation, the pain intensity scale decreases from scale 3 to scale 1. The implementation is carried out 3 to 4 times for 3 to 5 minutes, after which an evaluation is carried out after 15 minutes.

DISCUSSION

Before the intervention and implementation, the researcher first explains the purpose and benefits of providing deep breath relaxation techniques. Furthermore, the patient is taught to do deep breath relaxation techniques by the SOP available at the hospital with work steps, namely providing the patient with the opportunity to ask questions if there is something they do not understand, then adjusting the patient's position so that it is more relaxed without physical burden, then instructing the patient to inhale so that the lung cavity is filled with air. He then instructs the patient to slowly exhale air from the mouth and let it come out of every part of the body, while asking the patient to concentrate on feeling the pleasure of the taste. He then instructs the patient to breathe at a normal rhythm. Instruct the patient to take a deep breath, after which they should exhale slowly through the mouth and feel the current air flowing from the hands, feet, towards the lungs, then feel the air pulling all over the body. During the 5 minutes, the patient is asked to breathe normally 2 to 3 times in the cycle. Deep breath relaxation techniques are carried out to reduce pain. Besides that, deep breath relaxation is easy to learn and can reduce pain by reducing muscle pressure and anxiety. Providing deep breath relaxation techniques can increase lung ventilation and oxygenation in the blood (Asyari et al., 2024). Based on this description, the researcher argues that the provision of breath relaxation techniques helps reduce pain and is easy to do independently, so patients can do it themselves without help from others.

The results of the study that have been carried out show that there is a significant reduction in the pain scale after every 5-minute session for 3 days, and 2- 3 times the deep breath relaxation technique is carried out independently by the patient. The pain scale from the first day, namely from a scale of 7, decreased to a scale of 1. The implementation is carried out for 5 minutes, after which an evaluation is carried out after 15 minutes. This aligns with previous research that after giving the deep breath relaxation technique for 3x 24 hours, the pain decreased from scale 2 to scale 1. The deep breath relaxation technique was given three times and evaluated 15 minutes afterwards (Toussaint et al., 2020). The difference between this and previous studies is that each intervention was carried out three times. However, in this study, the deep breath relaxation technique was carried

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out for 5 minutes, and a break of 2 to 3 times was used for normal breathing. The evaluation was given 15 minutes afterwards, and in this study, patients could do it independently, approximately 2 to 3 times a day.

On the second day, the pain was on a pain scale of 5, and after the relaxation technique, the deep pain was reduced to a scale of 3. The patient looked more relaxed when the evaluation was conducted than on the previous day. Deep breath relaxation therapy could affect the pain scale, and respondents became more relaxed and calmer after doing deep breath relaxation (Jarrah et al., 2022). Based on this description, the researcher argues that the breath relaxation technique intervention helps reduce the pain scale and makes the patient more relaxed.

This study used the deep breath relaxation technique to reduce abdominal pain in DHF patients. The results of the patient's supporting examination showed that the patient's platelets were at 13,000 /uL. The provision of breath relaxation techniques helps to restore and control emotions that can relax the body. In the gate control theory, the provision of breath relaxation produces an impulse sent across the nociceptor afferent nerve fibers, which causes the gate to close, making the pain less and collapse. At other gates in the thalamus that regulate the pain impulse of the trigeminal nerve, the relaxation that occurs will be inhibited, so the gate in the thalamus will be closed. The nerve impulse that should be passed on so that it becomes painful cannot occur because the gate has been closed. Based on this description, the breath relaxation technique helps relax the body so that pain is reduced (Prayogi et al., 2022).

In this study, the deep breath relaxation technique was carried out independently 2 to 3 times a day without being accompanied by a researcher. The deep breath relaxation technique can reduce pain intensity by causing the skeletal muscles to become relaxed and experience spasms. As prostaglandins increase, the vasodilation of blood vessels will increase blood flow, which can lead to spasm and ischemia. Deep breath relaxation involves muscles and respiration that do not require other tools, making this technique possible when pain arises (Toussaint et al., 2020). Based on this description, the researcher argues that the deep breath relaxation technique can be done independently because it does not require assistive devices and helps reduce pain as long as it is done independently.

Patients who did the deep breath relaxation technique said they were more relaxed and could improve. Relaxation of the breath helps free the mind and body from stress and tension so that tolerance can increase. This technique can help people or patients control themselves when they feel discomfort, emotions, and physical stress in pain. The decrease in pain intensity occurs because this deep breath relaxation technique can help stimulate the body to secrete endogenous opioids, inhibiting pain impulses and decreasing pain perception (Gholamrezaei et al., 2022). Based on this description, the researcher argues that deep breathing relaxation helps control discomfort, including pain.

When performing relaxation techniques, it can deliver oxygen throughout the body and lower the stimulus. When the relaxation of muscle fibers is prolonged, the neural impulses to the brain will decrease, and then the activity of the brain and other body systems will decrease. Blood pressure, heart rate, respiratory frequency, and oxygen consumption decrease, and alpha brain activity and peripheral skin temperature will increase, a characteristic response of relaxation to relax the body (Asyari et al., 2024).

This study analyzes the provision of deep breath relaxation techniques to reduce pain in dengue hemorrhagic fever grade II patients treated at Dr. Soebandi Jember Hospital. Researchers focused on pain intensity as the variable studied. Based on the evaluation results, pain intensity decreased after 3 days of intervention, during treatment in the inpatient room of Lavender RSD dr. Soebandi Jember, patients received pharmacological therapy in the form of 3x2ml santagesic to

reduce pain. The therapy can be a confounding factor related to patient pain. As a solution, the researcher intervened before the patient was given santagetic.

CONCLUSION

The provision of deep breath relaxation techniques as a procedure to reduce pain in dengue hemorrhagic fever patients in the Lavender room of Dr. Soebandi Jember Hospital, namely, after being given the deep breath relaxation technique for 3 days, the intensity of pain decreased from a scale of 7 to a scale of 1. The deep breath relaxation technique is carried out once a day, with a duration of 5 minutes, in addition to being done independently by the patient researcher 2 to 3 times. The provision of relaxation techniques effectively reduces abdominal pain experienced by patients.

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