Nursing Care for Dengue Fever Patient in the Critical Phase, at a Hospital in West Jakarta

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ABSTRACT

Dengue Haemorrhagic Fever is a disease caused by the dengue virus due to the bite of the Aedes aegypti mosquito. Patients will go through 3 phases of this disease: fever, critical, and recovery. A complication that often occurs in the critical phase is dengue shock syndrome. This case report aimed to provide an overview of nursing care for patients in the critical phase of dengue hemorrhagic fever at a private hospital in West Jakarta. Care was provided by Diploma III nursing students for 4 days using a nursing process approach that includes assessment, diagnosis, planning, implementation, and evaluation. Data was collected using interview techniques, observation, and physical and diagnostic examinations. The assessment showed that the patient was in a grade II critical phase, characterized by the appearance of petechiae on both superior extremities without a tourniquet test. The nursing problems raised were the risk of hypovolemia, the risk of bleeding, acute pain, and nausea. The interventions provided focus on preventing bleeding and fluid management. The implementation includes providing appropriate fluid resuscitation, monitoring blood hematology laboratories, and encouraging patients to rest in bed to reduce the risk of other bleeding. On the fourth day of treatment, three nursing problems were solved: the risk of bleeding, acute pain and nausea. The nursing problem that was partially resolved is the risk of hypovolemia. In conclusion, in dengue hemorrhagic patients in the critical phase, nurses need to pay primary attention to the possibility of hypovolemia even though it is not necessarily an actual problem.

Keywords: nursing care, dengue fever, critical phase, fluid resuscitation

INTRODUCTION

Dengue hemorrhagic fever is a viral disease transmitted through the bite of the Aedes aegypti or Aedes albopictus species mosquitoes, which mostly live in the rainy season (Anggraini et al., 2021). According to data from the World Health Organization in 2023, dengue hemorrhagic fever is 1 in 10 diseases that threaten health, with a mortality rate of 96 million cases yearly (WHO, 2023). Indonesia is ranked second in Asia with the highest cases of dengue hemorrhagic fever (Ministry of Health of the Republic of Indonesia, 2021). The morbidity rate (incidence rate) in 2020 was 39.9 per 100,000 population with 48.45% occurring at ages >15 years (Ministry of Health of the Republic of Indonesia, 2021). The city of Jakarta contributed 4,227 cases in 2020 (Yuantari et al., 2020). Dengue hemorrhagic fever (DHF) occurs in all ages, from children to adults (Indriyani & Gustawan, 2020). 3,333 times more common in women, 92.8% of the population living in urban areas, with 8.5 times more common in people

who often hang up their clothes and do not look after the environment (Aliyyu, 2023; Fadrina et al., 2021; Rahmawati, 2019).

The dengue virus entering the human body will disrupt the capillary blood system, inhibiting blood clotting and causing severe bleeding if not treated properly (Ariyani et al., 2023). Manifestations of the disease include high fever at the start of the symptoms, accompanied by muscle, joint, bone, and abdominal pain, headache to the back of the eyes, weakness, nausea, vomiting, and red spots (petechiae) (Saputra & Nasution, 2021). Dengue hemorrhagic fever sufferers undergo three phases: fever, critical, and recovery (Ministry of Health, 2020). A complication that often occurs in the critical phase is dengue shock syndrome (DSS) caused by severe plasma leakage (Soedarto, 2012). Proper treatment and routine blood tests must be carried out until the patient passes the critical period to avoid severity and even death (Ariyani et al., 2023; Putranta, 2018). Although many sufferers will recover quickly, in the critical phase, there is a possibility of developing systemic vessel leakage, which usually lasts for 24 to 48 hours, so it is necessary to carry out laboratory investigations, especially platelets and leukocytes (Ministry of Health, 2020). The classification of DHF is divided into degrees I, II, III, and IV, where when signs and symptoms in the form of petechiae are found without a tourniquet test, it can be confirmed that the patient has entered grade II DHF (WHO, 2016).

The main intervention carried out in critical phase DHF patients is collaborative fluid management. When given appropriately, collaborative fluid resuscitation can overcome plasma fluid loss due to increased capillary permeability and bleeding (Ministry of Health, 2020). The function of these fluids is to replace losses and restore fluid balance depending on the degree of deficit and the response of each patient (Doenges et al., 2018). The risk of bleeding can be minimized by keeping the patient on bed rest and reducing activities that can worsen the condition (Siswo & Adimayanti, 2023). Research conducted by Hady et al. showed that some patients experienced gradual improvement, especially regarding hemodynamics, as a result of being given appropriate crystalloid and colloid fluid resuscitation (Hady et al., 2022). Each series can be well received if the patient is able to accept the disease, respond positively, and be cooperative. Not only patients but support from the family can influence psychosocial function and individual coping with problems, especially during the treatment period (Budi, 2021).

DHF Patients potentially to experiences hyperthermia that could lead to complication such as dehydration and even hypovolemic shock. Many articles about DHF found have captured some treatment needed. More case report found focuses on the problem of hyperthermia and the

problem related to fluid and uncovered some treatments performed by nurses to DHF patients. Warm compress therapy is effective to reduce body temperature (Fauziah et al., 2024). In order to overcome the water imbalance, it is a must to monitoring patient's water intake and output carefully (Musyayyadah, 2015). Some actions such as antipyretic and enough water consumption are suggested (Handayani, 2019), including the guava juice consumption (Purnamawati et al., 2022). However, there is no publication related nursing care for patient focused on critically phase of DHF.

Thus, the author wrote a case report of a patient with dengue hemorrhagic fever in the critical phase of grade II. The purpose of the case report is to provide an overview of the implementation of nursing care, starting from assessment, nursing diagnosis, nursing planning, implementation, and evaluation. This case report is important to understand the critical phase of caring for patients suffering from DHF for both nursing students and nurse practitioners.

METHODS

This study is a case report study. The study participant is one patient who was diagnosed with DHF. Data was collected through observation, interviews, physical assessments, and diagnostic examinations. The participants received four days of nursing care following the steps of the nursing process, namely: assessment, diagnosis, intervention, and implementation to evaluation. The Social Security Administering Agency (BPJS) health insurance facility provides nursing care in a private hospital in West Jakarta. The case report is presented using the nursing process steps.

RESULTS

Assessment

After receiving a referral from the community health center, the patient was admitted to the hospital to unit X through the emergency room in February 2024 afternoon (before noon). For 4 days before coming to the emergency room, the patient had experienced fever, nausea, headache, sore throat, muscle and joint pain. Before coming to the hospital, the patient experienced no appetite due to nausea, which became even more pronounced when he smelled an unpleasant odour. At home, the patient also experienced vomiting. The patient had no previous history of DHF, and this was the first.

The patient's complaints when he entered the emergency room were nausea, headache, sore throat, muscle and joint pain. While in the emergency room, the patient received Ringer Lactate (RL) fluid therapy 500ml/6 hours, Omeprazole 40mg (iv bolus), and Ondansetron 8mg (iv bolus). The patient was admitted to the treatment room in the afternoon; in the evening, the patient had a fever, so he consumed paracetamol 500mg orally. After treatment with paracetamol, the fever decreased. Medications still continued while in the treatment room, which were omeprazole 40mg, given until the third day of treatment, and ondansetron 2 x 8mg, given until the last day of treatment. The student met the patient in the morning, and he was already in a fever-free condition, even though the patient was not taking paracetamol again. Student nurses provide care from the second day the patient goes to the hospital until the time the patient is allowed to go home.

On the first day the student nurse meets the patient, the nurse conducts a comprehensive assessment. The patient's main complaint on the first day during the assessment in the inpatient room was nausea, but there was no vomiting. The patient still has no appetite, weakness, and pain in the pit of the stomach on a scale of 4 out of 10, which disappears in around 4 to 10 minutes. There were petechiae on both superior extremities without a Rumple Leed test, and the patient's mucous membranes appeared dry. The patient experienced a fever on the fourth day of treatment. The results of vital signs were: blood pressure 121/71mmHg, temperature 36.1 °C, respiratory rate 22x/minute, pulse rate 89x/minute, oxygen saturation 98%.

On the second day of treatment by students, the patient looked weak and pale, had dry mucous membranes, and complained of weakness and thirst. The results of measuring vital signs were blood pressure at 14.00 WIB 95/70 mmHg, pulse 89x/minute, at 16.00 WIB blood pressure 90/55 mmHg, pulse 90x/minute, and at 20.35 WIB blood pressure 100/80 mmHg, pulse 75x/minute minutes and still feels weak.

The results of blood laboratory tests showed that the patient's platelets decreased on the second day of treatment. Meanwhile, leukocyte and hemoglobin values were still within normal limits from the first day to the fourth day of treatment (table 1).

Table 1. Hematology results

Blood components	Day I	Day II	Day III	Day IV
Thrombocytes (thousand/uL)	27	12	33	71
Hemoglobin (g/dL)	13.5	12.1	11.5	11.3
Hematocrit (%)	42	37	35	35
Leukocytes (number of cells/uL)	5060	5230	5790	6150

Nursing Diagnosis

Nursing diagnoses can be determined based on data obtained from assessments according to patient's condition. The diagnostic standards refer to the Indonesian Nursing Diagnosis Standards (SDKI) by PPNI (PPNI SDKI Working Group Team, 2017). The diagnosis formulated based on the patient's condition was a diagnosis of bleeding risk, characterized by the appearance of petechiae on both superior extremities and low platelet values reaching 12 thousand/µL. The second diagnosis of risk of hypovolemia is indicated by a palpable weak pulse, looking weak, pale, dry mucous membranes, platelet laboratory 27 thousand/uL, Hemoglobin 13.5 g/dL, leukocytes 5060/uL, Hematocrit 42%. The third diagnosis of acute pain related to a physiological injuring agent is characterized by pain under the solar plexus with a pain scale of 4 out of 10 using a visual analog scale. Lastly, the diagnosis of nausea is related to an unpleasant odor and stomach irritation, characterized by complaints of nausea, wanting to vomit, looking pale, and having no appetite.

Nursing Plan

Nursing planning refers to nursing output standards and Indonesian nursing intervention standards (PPNI SIKI Working Group Team, 2018). The interventions formulated are taken based on the diagnosis and complaints that arise in the patient. The interventions that are appointed include prevention of bleeding in the diagnosis of risk of bleeding, management of hypovolemia in the diagnosis of risk of hypovolemia, pain management in the diagnosis of acute pain, and finally vomiting management for the diagnosis of nausea (PPNI SDKI Working Group Team, 2017).

The planned nursing interventions are bleeding prevention, fluid management, nausea management, and pain management (PPNI SDKI Working Group Team, 2017). The goals are to increase mucous membrane moisture, blood pressure, pulse pressure, pulse frequency, body temperature, diet, and improved capillary refill (PPNI SLKI Working Group Team, 2017). Then, the appearance of pallor, complaints of pain, anxiety, difficulty sleeping, and nausea can decrease, and there is an increase in platelet laboratory results. Planned interventions focus on bleeding prevention and fluid management (PPNI SIKI Working Group Team, 2018). Regarding the risk of bleeding, the plan is to monitor signs and symptoms of bleeding, monitor blood hematology laboratory results, maintain bed rest, explain the signs and symptoms of bleeding, and advise the patient not to brush his teeth, pick his nose and avoid hitting his body and avoid straining too hard. During defecation, regarding the risk of hypovolemia, the planned

intervention is identifying the occurrence of symptoms of hypovolemia, calculating fluid intake and output, recommending increasing oral fluid intake and collaborating with a doctor to administer isotonic fluids such as NaCI or RL, related to acute pain. The planned intervention is identification. Frequency, location, characteristics, quality, duration, pain intensity, and pain scale busing the Visual Analog Scale (VAS), factors that can relieve and aggravate pain, provide and teach non-pharmacological techniques to reduce pain such as using breathing relaxation deep, provide a comfortable position, and facilitate the patient's rest and sleep (PPNI SIKI Working Group Team, 2018).

Then, to diagnose nausea, the interventions given include identifying the impact of nausea on quality of life, the causes of nausea, the severity of nausea and controlling environmental factors that cause nausea, recommending the use of eucalyptus oil, as well as collaborating on the use of antiemetics, proton pump inhibitor (PPI) drugs, and appetite enhancers. to increase appetite and reduce nausea (PPNI SIKI Working Group Team, 2018).

Nursing Implementation

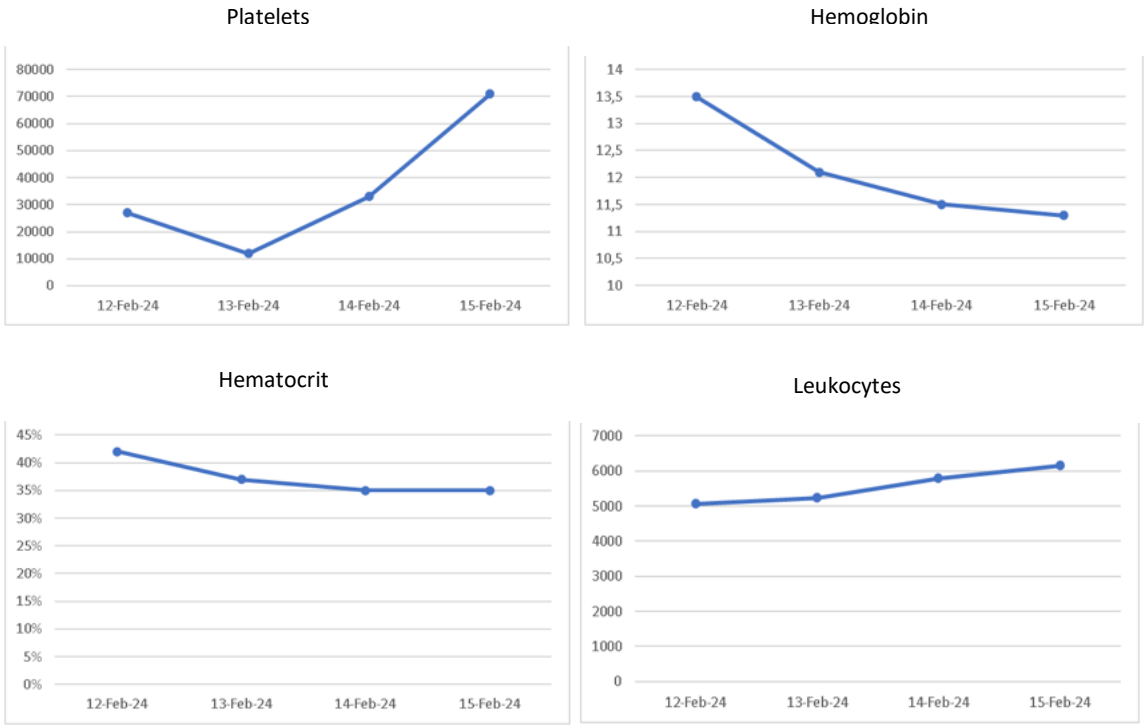
Regarding the risk of bleeding, nurses monitor signs and symptoms of bleeding and blood hematology laboratory results (Amir et al., 2021). Nurses also provide education regarding the signs of bleeding that need to be paid attention to by patients and families and advise patients not to brush their teeth, pick their noses, or protect their bodies so they don't bump into each other. For independent action, the nurse keeps the patient on bed rest (Firsiyanti et al., 2023; Purba, 2020; Siswo & Adimayanti, 2023).

Implementation for the risk of hypovolemia is addressed by identifying signs and symptoms of hypovolemia, calculating fluid intake and output, recommending increasing oral fluid intake, and collaborating with a doctor to administer isotonic fluids (Ringer Lactate)(PPNI SIKI Working Group Team, 2018).

Implementations that have been carried out to deal with acute pain are identifying the frequency, location, characteristics, quality, duration, and intensity of pain, and pain scales using a visual analog scale (VAS), identifying factors that can alleviate and aggravate pain (PPNI SIKI Working Group Team, 2018). Providing a comfortable supination position, facilitating patients to get enough rest and sleep, and teach non-pharmacological techniques that can relieve pain (PPNI SIKI Working Group Team, 2018).

Try to overcome the diagnosis of nausea by identifying the factors that cause nausea, controlling environmental factors that cause nausea, monitoring nausea and collaborating with a doctor to administer anti-inflammatory drugs and food supplements and inhaling eucalyptus oil to reduce nausea.

Picture 1. Patient's Complete Blood Test



Nursing Evaluation

After implementation, an evaluation of each nursing diagnosis is carried out based on the goals, expected results, and actions that have been carried out day by day. Nursing evaluations are carried out every day after completing the shift. On the second day of treatment, the patient showed a decrease in platelet values. On the second day of treatment, the hematocrit value decreased by 7% after fluid resuscitation. The value of another blood component that decreased was Hemoglobin. Meanwhile, the leukocyte value experienced a slight increase. Platelets began to increase on the third day of treatment, and the petechiae began to fade on the third day of treatment.

After the fourth day of implementation, the nurse performed a thorough evaluation. The increase in platelet values indicated that the risk of bleeding and the risk of hypovolemia was starting to solve. Moreover, the bleeding stopped, the mucous membrane appeared moist, CRT

was one second, and skin turgor elasticity was normal. The nurse concluded that the diagnosis was solved. The diagnosis of acute pain has not yet been resolved because the patient still complains of pain on a scale of 2/10. The diagnosis of nausea has also not been resolved because the patient still complains of nausea, even though it has greatly reduced and the patient is able to finish eating one portion.

DISCUSSION

This case report is a case report of the treatment of a DHF patient in the critical phase. Determining the DHF phase is based on calculating the days of fever, which occurs on days 3 to 7 (Ministry of Health, 2020). The patient had had a fever for 4 days before entering the hospital; this is an indication that when he came to the emergency room, it was likely that the patient had entered the critical phase. During this critical phase, plasma leakage usually occurs, lasting 24-48 hours (Ministry of Health, 2020). If plasma leakage occurs excessively and continues to eat, it will cause Dengue Shock Syndrome (DSS). So, with the patient's condition being in a critical phase, patient care needs to be carried out appropriately and carefully to prevent shock. Symptoms of DSS are hypotension, bradycardia or tachycardia due to hypovolemic shock, hepatomegaly, hypothermia, rapid and weak palpable pulse, narrow pulse pressure (<20mmHg), decreased peripheral perfusion such as cold skin and restlessness (Prayoga, 2021; Rofida et al., 2021). When the condition gets worse, it will cause stomach pain, vomiting, seizures (convulsions), and decreased consciousness or even coma (Ministry of Health, 2020).

The critical phase needs appropriate fluid resuscitation treatment (Syakir, 2020). In this critical phase, the patient's blood pressure appears to change from 125/80 mmHg to 95/70 mmHg the following day. However, the patient did not experience DSS because the patient received appropriate treatment, especially in terms of fluid resuscitation. The patient has received RL fluid resuscitation 500ml/6 hours since being in the ER. The patient found no symptoms of decreased skin turgor or cold sweats. Decreased skin turgor and cold dryness in DHF patients usually appear to be related to circulation disorders, leading to hypovolemia symptoms (PPNI SDKI Working Group Team, 2017; Syakir, 2020). The occurrence of hypovolemia in patients and even hypovolemic shock is prevented due to hemodynamic and laboratory compensation by fluid resuscitation from the start of the assessment. Adequate fluid intake can prevent patients from experiencing fluid deficiency or hypovolemia (Puspita et al., 2018). Some patients experienced gradual improvement, especially regarding hemodynamics, mental status,

and clinical and laboratory symptoms, as a result of being given appropriate crystalloid and colloid fluid resuscitation (Hady et al., 2022). Appropriate fluid resuscitation determines the success of treatment in the critical phase.

From skin observation, the nurse found petechiae in both superior extremities. Thrombocytopenia in DHF patients occurs if the platelet value is below 100 thousand/microliter. Petechiae are small spots that appear on the surface of the skin as a sign of small amounts of blood being released (Rahman, 2021). Petechiae's appearance indicates that a plasma leak has occurred (Ministry of Health, 2020). Fading petechiae indicates that the body is undergoing intravascular volume reabsorption or repair of plasma.

Regarding the risk of bleeding, nurses monitor the results of blood tests, because platelet values that are still below normal are a risk factor for bleeding in patients. One thing that is recommended to patients is to clean their teeth carefully. Low platelet levels will increase the appearance of bleeding manifestations, including gum bleeding. Using a toothbrush can increase the risk of bleeding in the dental mucosa because thrombocytopenia is prone to bleeding (Purba, 2020). Abnormal hematoma formation and disruption of clotting factors, as well as minimal trauma, can cause mucosal bleeding (Doenges et al., 2018). Brushing your teeth too hard with the wrong brushing technique can trigger bleeding. Provide education about the signs of bleeding and how to prevent bleeding. The success of education is influenced by nurses' abilities when communicating (Ariyani et al., 2023). Education is important to be able to involve patients and families in care.

Heartburn and nausea caused the patient to have no appetite. This problem has been addressed pharmacologically and non-pharmacologically. Heartburn appears in patients due to viruses entering the gastrointestinal tract through the bloodstream, which stimulates the production of stomach acid and causes damage to the gastric mucosal epithelium (Rahman & Dirdho, 2015). Nausea occurs due to irritation in the stomach due to the dengue virus, which spreads to the digestive tract (Saudi et al., 2023). Generally, non-pharmacological pain management is a healing action using caring behaviour, so the nurse is the dominant actor in this implementation (Mayasari, 2016). Avoiding strong-smelling and fishy foods can reduce the symptoms of excessive nausea and vomiting experienced (Sipayung et al., 2022). Inhaled eucalyptus oil aromatherapy contains cineole (eucalyptol), a monoterpene compound for treating nausea (Indriyani et al., 2023). Several factors worsen and alleviate pain, such as anxiety, tension, internal temperature, and body position (Novitasari & Aprilia, 2023).

Non-pharmacological deep breathing relaxation therapy can be given when pain appears. Deep breathing relaxation can help reduce perceptions related to pain responses (Nurhanifah & Sari, 2022). Nursing actions in the form of providing a comfortable position for the patient, starting from Fowler's, semi-Fowler's, or supination, can also be given to reduce pain (Suwaryo et al., 2021). In the Kolcaba theory of comfort, the actions must prioritize the patient's safety and comfort while being treated in the hospital so that each individual has various positioning strategies to reduce pain (Karifo, 2019). Comfortable positions are part of the facilities provided so patients can get enough sleep. In general, sick people need more sleep than normal people, and pain disrupts the normal sleep rhythm (Bashir, 2020). Non-pharmacological treatment can also be given to patients.

The role and function of nurses in caring for DHF patients in the critical phase is very crucial. The nurse's role, which is very visible in this case, is that of a caregiver. Nurses also collaborate with other health workers, fellow nurses, and doctors. This is important because treating patients in the critical phase requires careful attention for 24 hours due to life-threatening conditions. A factor in the success of patient care is the support provided by nurses to meet nutritional needs, especially fluids (Utami & Hapsari, 2016). In another implementation, the author collaborated with a doctor, guided by a room nurse, who administered 500 ml/6 hours of isotonic ringer lactate (RL) fluid using an infusion pump 28 times during the 4-day treatment period and 100 ml NaCl only on the second day of treatment once a day. Adequate fluid intake can prevent patients from experiencing fluid deficiency or hypovolemia (Puspita et al., 2018).

There were no obstacles to collaboration during the treatment process because there was good collaboration between the room nurses, students, and doctors on duty. Interprofessional collaboration between doctors and nurses is necessary to improve care quality and efficiency. Establishing good interprofessional collaboration will certainly reduce mortality rates, complications, length of stay, care costs, and duration of treatment, as well as increase service satisfaction and reduce conflicts between health teams (Jones & Fitzpatrick, 2009). In the critical phase, the nurse's caregiver focuses on meeting fluid needs.

The role of nurses as educators has been given by providing information on adequate fluids and eradicating mosquitoes that cause DHF, which needs to be done when they arrive home. One of the aims of education is to help increase knowledge about disease. According to the agreement, a schedule needs to be made after that so that it does not disturb the patient's rest time (Mayastika, 2022). In its application, nurses need to allow patients to ask questions. In

this way, there is an increase in patient understanding of the health education material provided (Hidayat et al., 2024).

Another factor is the form of material and media that clarifies the delivery of health education (Pristya et al., 2021). The diagnosis of a knowledge deficit can certainly be a discharge planning carried out by the nurse before the patient goes home. Nurses provide discharge planning, education regarding diet and rest patterns, and control after the patient returns from the hospital, but they can also prevent DHF from recurrence if implemented well at home. The success of the education delivered is related to the media used during the education. Leaflets are a type of media in the form of sheets of paper designed attractively and then folded to contain writing and images (Akbar et al., 2021) The effectiveness of using leaflet media in education is quite high. Leaflets are a medium with low costs, are quite practical, easy to carry, understand, and long-lasting (Pristya et al., 2021) Education is an important thing to do to perfect all interventions carried out.

CONCLUSION

Proper treatment of DHF patients requires a good understanding of the phases of the disease by health workers. In the critical phase where plasma leakage occurs, appropriate fluid resuscitation plays an important role in successfully treating patients in this phase. Nurses need to understand the symptoms related to DSS in order to be able to provide help quickly and completely. Suggestions for nurses are expected to be able to establish a diagnosis according to the patient's condition. Therefore, an assessment must be carried out in detail to determine the diagnosis, especially regarding signs of bleeding and hypovolemia, which are typical in DHF patients. Then, because of the rapid changes in each phase in DHF patients, nurses must be able to modify nursing interventions quickly and precisely according to the conditions and time of care for patients with Dengue Hemorrhagic Fever (DHF). Moreover, health service providers are expected to provide nurses with training on handling DHF and patients in the critical phase so that the handling of patients in the critical phase can be carried out well and quickly.

LIMITATION

Regardless of the merit of this study, this case report has some limitations. Because this patient had social security insurance, this study could not provide all the diagnostic tests, such as the

Ns1 examination, which is useful for detecting viruses quickly. This case report was performed by a Diploma nursing student with minimal experience in caring for a DHF patient.

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