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Evaluation of The Rationality of Dengue Hemorrhagic Fever (DHF) Treatment in Inpatients at Rsi Siti Aisyah Madiun in The 2024 Period

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Abstract

Background of Study: Drug rationality is an important aspect to ensure the achievement of therapeutic effects and improve the quality of life of patients with the criteria of the right drug, right dose, right diagnosis and right indication. Meanwhile, thet use oft a drugt is saidt to bet irrationalt if thet possibilityt of negativet impactst receivedt by thet patientt is greatert than its benefitstt.
Aims and Scope of Paper: This study aimst to determine the descriptiont of the rationalityt of Denguet Hemorrhagict Fevert (DHF) treatment in hospitalized patients at RSI Siti Aisyah Madiun in terms of the right drug, right dose, right diagnosis, and right indication.
Method: The study used was an observationalt study conductedt retrospectively with univariate analysis and purposive sampling techniques.
Results: The use of drugs for Dengue Hemorrhagic Fever (DHF) from the electrolyte fluid group, namely asering infusion 22.56%, RL infusion 33.83%, NS infusion 23.31%, D5 infusion 0.45% 20.30%, and for the antipyretic group, namely paracetamol 100%, for the antiemetic group, namely ondansetron 67.67%, metoclopramide 32.33% while from the supplement and vitamin group, namely curcuma 77.44% and psidii 22.56%. The rationality of drug use includes 100% correct drug, 97.74% correct dose, and 100% correct diagnosis and 100% correct indication.
Conclusion: Based on the variables tested, thet rationalityt of the uset of drugs for Dengue Hemorrhagict Fevert (DHF) has met the criteria for rationality of treatment.

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INTRODUCTION

Dengue Hemorrhagic Fever (DHF) is an infectious disease caused by dengue virus (DENV) serotypes 1-4, transmitted by the Aedes aegypti mosquito and, to a lesser extent, by the Aedes albopictos mosquito (Wang et al., 2020). DHF is widespread throughout the tropics. Other factors contributing to dengue fever are high rainfall and rapid urbanization. Approximately 3-6 billion people live in endemic areas, with 390 million cases of infection occurring annually (Nugraheni et al., 2023).

According to WHO data, an estimated 50 million dengue fever infections occur worldwide each year. An estimated 500,000 people with dengue fever require hospitalization each year. Most (around 90%) are children under 5 years old, and around 2.5% die. Eight countries in Asia have the highest total number of dengue fever cases, including Indonesia (WHO, 2011). Dengue fever cases in Southeast Asia increased by 46% between 2015 and 2019, with the high number of dengue fever cases in some parts of Southeast Asia being more due to the lack of appropriate treatment (Sutriyawan et al., 2022). Of this number, the majority of cases were reported in 10 provinces,

including East Java, which recorded a total of 5,948 cases.

The East Java Health Office reported that the incidence of dengue fever (DHF) in East Java Province is relatively high. In 2019, 18,393 people were infected with dengue fever in East Java, with 185 of them dying. Meanwhile, in January 2020, there were 811 cases with 6 deaths (Kemenkes RI, 2021). In February 2020, 948 people were recorded as ill and 9 people died from dengue fever. Thus, the total number of dengue fever cases from January to February 2020 reached 1,759 people with 15 deaths (Berutu & SusilawatI, 2019).

Based on data from the National Waste Management Information System (SIPSN) in 2020, Indonesia's waste generation reached 33.32 million tons, 17.16% of which came from markets. In 2020, Madiun Regency generated 99,900 tons of waste, making it the largest contributor to waste. This contributes to diseases such as dengue fever. In 2021, the mortality rate from dengue fever in Madiun Regency remained high and exceeded the national target of <1% (Zulfa, 2023) .

Dengue Hemorrhagic Fever (DHF) remains a public health problem in Indonesia. Its spread in Indonesia is closely related to environmental factors such as population movement and density, as well as the presence of containers and nearby waste disposal sites. Factors influencing the occurrence of DHF outbreaks include host factors, environmental factors, lifestyle habits, and the nature of the virus itself (Marhana & Fanti, 2025). Host factors include the degree of susceptibility and the body's immune response, while environmental factors encompass various aspects such as geography (altitude, rainfall patterns, wind, humidity, seasons, etc.) and demographic conditions (population density, mobility, behavior, and community habits) (Liziawati et al., 2023).

The clinical symptoms of dengue fever are sudden high fever, bleeding, thrombocytopenia, and hemoconcentration. The occurrence of abnormal hemostasis and plasma leakage are the main pathophysiological changes in dengue fever (Kusuma, 2025). Dengue fever can develop into dengue shock syndrome which can result in death. Dengue hemorrhagic fever generally lasts continuously for 2-7 days, the manifestation of bleeding in dengue fever is characterized by thrombocytopenia (platelet count ≤ 100,000 t/µl), hemoconcentration (increased hematocrit ≥ 209% t) accompanied by or without liver enlargement (Fransiska & RingoRingo, 2020).

Dengue infection can be treated symptomatically and supportively, namely by addressing the loss or deficiency of plasma fluid caused by increased capillary permeability and bleeding. Supportive therapy is given in the form of replacement fluids, namely intravenous fluids such as lactated Ringer's solution, crystalloids, and colloids. Meanwhile, symptomatic therapy for DHF patients includes the administration of antipyretics (paracetamol), antiemetics (domeridone, ondansetron, and metoclopramide), supplements, vitamins, and herbal medicines (Sambou, 2022). Antipyretics are drugs to lower body temperature that exceeds the normal limit (>38°C) (Meriska et al., 2019). Antiemetics are drugs used to suppress complaints of nausea and vomiting. Meanwhile, the administration of supplements, vitamins, and herbal medicines is generally needed to help meet the patient's immune system's nutritional needs so that it does not decrease and can aid the healing process (Candra, 2019).

Rational drug use is an important aspect to ensure the achievement of therapeutic effects and improve the quality of life of patients. The use of drugs to treat dengue fever must be rational, having the right criteria, the right indication, the right drug, and the right dosage (KemenkesRI, 2011). Drug use is said to be rational if the patient receives the drug that suits their needs, for an adequate period of time and at the lowest price for the patient and the community. Meanwhile, the use of a drug is said to be irrational if the possibility of negative impacts received by the patient is greater than the benefits (WHO, 2009).

Until now, Dengue Hemorrhagic Fever is one of the diseases with a high number of cases and mortality rates, so it is necessary to have accurate therapy to reduce the number of deaths. One

aspect related to this is the rationality of drug use (Wulan et al., 2024). Dengue Hemorrhagic Fever is caused by a virus, so the administration of antibiotics in the treatment of DHD is not necessary unless there is a secondary infection, DSS, and encephalopathy caused by bacteria considering the possibility of secondary infection can occur with the translocation of bacteria from the gastrointestinal tract. However, in several cases of DHF patient treatment, antibiotics are still found (Ningrum et al., 2023). Based on the above background, this study was conducted to determine the description of the rationality of treatment in inpatients with Dengue Hemorrhagic Fever (DHF) at RSI Siti Aisyah, Madiun City in 2024.

METHOD

This activity was carried out in March 2025-May 2025 at RSI Siti Aisyah, Madiun City. This activity was carried out using a descriptive, non-experimental observational method by observing without providing special treatment to an object (Firmansyah, 2022). Data collection used was retrospective, namely using medical record data from DHF patients who were inpatients during the period January 2024- October 2024 at RSI Siti Aisyah, Madiun City.

RESULTS AND DISCUSSION

Patient Characteristics Based on Age and Gender

Table 1 Characteristics of Research Subjects Based on Age and Gender

Age	Man	Percentage (%)	Woman	Percentage (%)	Amount	Percentage (%)
1-18 years	28	21,05	22	16,54	50	37,59
19-44 years	41	30,83	35	26,32	76	57,15
45-59 years	2	1,50	5	3,76	7	5,26
≥60 years	-	-	-	-	-	-
Total	**71**	**53,38**	**62**	**46,62**	**133**	**100**

The characteristics of Dengue Hemorrhagic Fever (DHF) patients sampled at Siti Aisyah Islamic Hospital Madiun for the period January 2024 – October 2024 in Table V.1 show that the most cases occurred in male patients with 71 patients (53.38%) and female patients with 62 patients (46.62%). The results of the data obtained are in accordance with research conducted by Munawaroh et al. (2017) which showed that the incidence of DHF in men was 56.6% and women as much as 43.4%. The small difference proves that Dengue Hemorrhagic Fever (DHF) is not influenced by gender (Meriska et al., 2019).

Medication Use Profile

Table 2. Medication use in patients with dengue fever (DHF) hospitalized at Siti Aisyah Islamic Hospital, Madiun

Drug Class	Drug Name	Amount	Percentage (%)
Electrolyte Fluid	Asering Infusion	30	22,56
	RL Infusion	45	33,83
	NS Infusion	31	23,31
	D5% Infusion 0.45	27	20,30
Total		**133**	**100**
Antipyretic	Paracetamol 500 mg	133	100
Total		**133**	**100**
Prokinetic antiemetic	Ondansetron 4 mg	90	67,67
	Metochlopramide 10 mg	43	32,33

Total		**133**	**100**
Supplements to increase appetite	Curcuma	103	77,44
Supplements to increase platelet levels	Psidii	30	22,56
Total		**133**	**100**

Based on the results of the table above, the profile of the use of solid electrolyte solutions in Dengue Hemorrhagic Fever (DHF) patients sampled at the Siti Aisyah Islamic Hospital in Madiun used Asering infusion fluid for 30 patients (22.56%), RL infusion fluid for 45 patients (33.83%), NS infusion fluid for 31 patients (23.31%), and D5% 0.45 infusion fluid for 27 patients (20.30%). The most commonly used electrolyte solution in inpatients with Dengue Hemorrhagic Fever (DHF) at the Siti Aisyah Islamic Hospital in Madiun was RL infusion for 45 patients (33.83%). The use of antipyretic drugs used was paracetamol 500 mg for 133 patients (100%). The use of prokinetic antiemetic drugs to treat nausea and vomiting, namely ondansetron 4 mg in 90 patients (67.67%) and metochlopramide 10 mg in 43 patients (32.33%).Penggunaan obat golongan suplemen yang digunakan yaitu curcuma sebanyak 103 pasien (77,44%) dan psidii sebanyak 30 pasien (22,56%).

Rationale for Medication Use

1. Accurate Diagnosis

Table 3. Accurate Diagnosis in Dengue Hemorrhagic Fever (DHF) Patients at Siti Aisyah Islamic Hospital, Madiun

Accuracy	Amount	Percentage (%)
Correct Diagnosis	133	100
Incorrect Diagnosis	0	0
Total	**133**	**100**

Diagnostic accuracy can be done by looking at the patient's history, physical examination to supporting examinations if customary. The use of drugs is said to be rational if it is given for the correct diagnosis (Sugiyanto et al., 2024). The results of 133 medical records of patients with Dengue Hemorrhagic Fever (DHF) hospitalized at RSI Siti Aisyah Madiun for the period January 2024 - October 2024 as in Table V.3 regarding the accuracy of diagnosis in patients, namely as many as 133 patients (100%) have met the criteria for an accurate diagnosis as evidenced by laboratory test results in the form of platelet levels, hematocrit levels, and other clinical test examinations.

2. Medication Accuracy

Table 4 Medication Accuracy in Dengue Hemorrhagic Fever (DHF) Patients at Siti Aisyah Islamic Hospital, Madiun

Drug Classes	Accuracy	Amount	Percentage (%)
Electrolyte Solutions	Correct Medication Incorrect Medication	133 0	100 0
	Total	133	100
Antipyretics	Correct Medication Incorrect Medication	133 0	100 0
	Total	133	100
Prokinetic Antiemetics	Correct Medication Incorrect Medication	34 99	25,56 74,44
	Total	133	100
Supplements	Correct Medication Incorrect Medication	133 0	100 0
	Total	133	100

The administration of medication is said to be appropriate if the type of medication chosen is based on consideration of benefits and risks (Tayal et al., 2023). Table 5 shows that the appropriateness of medication in inpatients with Dengue Hemorrhagic Fever (DHF) at RSI Siti Aisyah Madiun for the period January 2024 - October 2024 for electrolyte fluid drugs, as many as 133 patients (100%) have met the criteria for appropriate medication and as many as 0 patients (0%) have not received the appropriate medication, for antipyretic drugs, as many as 133 patients (100%) have met the criteria for appropriate medication and as many as 0 patients (0%) have not received the appropriate medication, for the prokinetic antiemetic drug group, 83 patients (62.4%) have met the criteria for appropriate medication and 50 patients (37.6%) have not received the appropriate medication, for the supplement drug group, 133 patients (100%) have met the criteria for appropriate medication and 0 patients (0%) have not received the appropriate medication. In the antiemetic drug group, it is said to be inappropriate because child patients (1-18 years) received the antiemetic drug group, namely ondansetron, where the use of ondansetron in children must be watched out for because it can cause side effects in the form of neurological effects such as short term extrapyramidal disorders, uncontrolled movements such as muscle spasms (often occurring in the head and neck), tardivet dyskinesia (uncontrolled movements such as grimacing and twitching), ECG changes, hypotension, tachycardia, bronchospasm, and constipation. The recommended use of antiemetic drugs for children is domperidonet (Meriska et al., 2019).

3. Correct Dosage

Table 5. Correct Dosage in Patients Hospitalized with Dengue Hemorrhagic Fever (DHF) at Siti Aisyah Islamic Hospital, Madiun

Drug Class	Accuracy	Amount	Percentage (%)
Fluids Electrolytes	Correct Dose	133	100
	Incorrect Dose	0	0
	Total	133	100
Antipyretics	Correct Dose	130	97,74
	Incorrect Dose	3	2,26
	Total	133	100
Prokinetic Antiemetic	Correct Dose	129	97
	Incorrect Dose	4	3
	Total	133	100
Supplement	Correct Dose	133	100
	Incorrect Dose	0	0
	Total	133	100

Drug dosage is the amount of medication that can produce a therapeutic effect on the affected body function. Excessive dosage, especially for drugs with a narrow therapeutic range, will risk side effects. Too small a dose will not guarantee the achievement of the expected therapeutic level (Sharma, 2011) Table V.5 shows that the accuracy of the dosage of the use of electrolyte fluid drug groups, namely asering infusion, RL infusion, NS infusion, and D5% 0.45 infusion, as many as 133 patients were declared the correct dose (100%) and as many as 0 patients were declared the incorrect dose (0%). From the antipyretic drug group, namely paracetamol, as many as 133 patients (97.74%) were declared the correct dose and as many as 3 patients (2.26%) were declared the incorrect dose. It is said that the dose is not appropriate because the dose given to the patient is underdose, namely in a 13-year-old patient who received paracetamol syrup with a dose of 120 mg/5 ml which is not in accordance with the 1997 WHO guidelines, namely 500 mg/dose; in an 8-year-old patient who received paracetamol syrup with a dose of 120 mg/5 ml which is not in accordance with the 1997 WHO guidelines, namely paracetamol syrup 240 mg/dose; and a 9-year-old patient who received paracetamol syrup with a dose of 120 mg/5 ml which is not in accordance

with the 1997 WHO guidelines, namely paracetamol syrup 240 mg/dose. From the group of prokinetic antiemetic drugs, namely ondansetron and metochlopramide, 129 patients (97%) were declared appropriate and as many as 4 patients (3%) were declared inappropriate doses. This is because pediatric patients (1-18 years old) were given a prokinetic antiemetic, ondansetron, at a dose of 4 mg/dose intravenously, when the dosage should be less than 4 mg/dose. ondansetron use in children is calculated based on body weight (Fugetto et al., 2020). Of the supplements, namely curcuma and psidii, 133 patients (100%) were found to be receiving the correct dose, while 0 patients (0%) were found to be receiving the incorrect dose.

4. Accurate Indications

Table 6. Accurate Indications for Dengue Fever (DHF) Inpatients at Siti Aisyah Islamic Hospital, Madiun

Accuracy	Amount	Percentage (%)
Correct Indication	133	100
Inaccurate Indication	0	0
Total	133	100

The use of appropriate medication indications is based on the patient's diagnosis. The accuracy of deciding on medication administration must be based strictly on the medical reasons and pharmacological therapy needed by the (Sharma, 2011). Table V.5 shows that the accuracy of the indications of Dengue Hemorrhagic Fever (DHF) patients was 133 patients (100%) and 0 patients (0%) were declared inappropriate indications, as evidenced by the complaints experienced by the patients.

CONCLUSION

Based on the results of the study on the rationality of solid medication use in Dengue Hemorrhagic Fever (DHF) patients at Siti Aisyah Islamic Hospital in Madiun for the 2024 period, it can be concluded that the use of solid medication in Dengue Hemorrhagic Fever (DHF) patients is considered rational, including: correct diagnosis in 133 patients (100%), correct medication in the electrolyte fluid group in 133 patients (100%), antipyretic in 133 patients (100%), antiemetic prokinetic in 83 patients (62.4%), and supplement in 133 patients (100%), correct indication in 133 patients (100%), and correct dosage in the electrolyte fluid group in 133 patients (100%), antipyretic in 130 patients (97.74%). in the prokinetic antiemetic group as many as 129 patients (97%); and in the supplement group as many as 133 patients (100%).

REFERENCES

Berutu, W. O., & SusilawatI, S. (2019). Hubungan Sanitasi Lingkungan Rumah Tinggal Dengan Kejadian Demam Berdarah. *Humantech : Jurnal Ilmiah Multidisiplin Indonesia*, *1*(8), 55–67. https://doi.org/https://doi.org/10.32670/ht.v1i8.1927

Candra, A. (2019). Asupan Gizi Dan Penyakit Demam Berdarah/ Dengue Hemoragic Fever (DHF). *Journal of Nutrition and Health*, *7*(2), 23–31. Google Scholar

Firmansyah, D. (2022). Teknik Pengambilan Sampel Umum dalam Metodologi Penelitian : Literature Review General Sampling Techniques in Research Methodology : Literature Review. *Jurnal Ilmiah Pendidikan Holistik (JIPH) Vol.1,* *1*(2), 85–114. https://doi.org/https://doi.org/10.55927/jiph.v1i2.937

Fransiska, A. A., & RingoRingo, V. S. (2020). Pemantauan Terapi Obat Pada Pasien Demam Berdarah Dengue (DBD GRADE 1) DI RUMAH SAKIT X. *Social Clinical Pharmacy Indonesia Journal*, *5*(1), 77–82. https://doi.org/https://doi.org/10.52447/scpij.v5i1.2053

Fugetto, F., Filice, E., Biagi, C., Pierantoni, L., Gori, D., & Lanari, M. (2020). Single-dose of ondansetron for vomiting in children and adolescents with acute gastroenteritis — an updated systematic

review and meta-analysis. *European Journal of Pediatrics*. https://doi.org/https://doi.org/10.1007/s00431-020-03653-0

KemenkesRI. (2011). *Modul Penggunaan Obat Rasional Dalam Praktek* (Vol. 3). Google Scholar.

KemenkesRI. (2021). Pedoman nasional pelayanan kedokteran tata laksana infeksi dengue anak dan remaja. *Tatalaksana Dengue*, 1–67. Google Scholar

Kusuma, S. sudana. (2025). Clinical manifestations and complication of dengue infection in children : Insights and comparisons with adult cases. *General Practitioner*, *52*(1), 6–9. Google Scholar

Liziawati, M., Zakiati, U., Rachmawati, F., & Pohan, T. (2023). Pemberdayaan Masyarakat Dalam Pengendalian Demam Berdarah Dengue Melalui Pembentukan Kampung Berbatik Di Kelurahan Pancoran Mas Dan Beji Kota Depok. *Journal of Human And Education*, *3*(1), 7–14. Google Scholar

Marhana, A., & Fanti, R. (2025). Analysis of Dengue Hemorrhagic Fever Prevention in Indonesian Coastal Communities : A review. *Journal of Health Science and Pharmacy*, *2*(2), 158–169. https://doi.org/https://doi.org/10.36685/jhsp.v2i2.1189

Meriska, N., Susanti, R., & Nurmainah. (2019). Evaluasi Penatalaksanaan Terapi Penyakit Demam Berdarah Dengue (Dbd) Pada Pasien Anak Di Instalasi Rawat Inap Rsud Sultan Syarif Mohamad Alkadrie Tahun 2019. *Jurnal Wiraraja*, *1*, 44–45. Google Scholar

Munawaroh, U., Nurmainah, & Untari, E. K. (2017). Gambaran Penggunaan Antibiotik Pada Pasien Anak Yang Menderita Demam Berdarah Dengue (DBD) Di Instalasi Rawat Inap Rsud Sultan Syarif Mohammad Alkadrie Pontianaktahun 2017. *Program Studi Farmasi. Fakultas Kedokteran Universitas Tanjungpura*, 4–15. Google Scholar

Ningrum, D. M., Septiana, E., Permana, D. A. S., & Wahida, A. (2023). Kajian Pengobatan Dengue Haemoragic Fever (DHF) di Rumah Sakit Pendidikan Universitas Mataram. *LUMBUNG FARMASI ; Jurnal Ilmu Kefarmasian*, *4*(1), 1–6. Google Scholar

Nugraheni, E., Rizqoh, D., & Sundari, M. (2023). Manifestasi Klinis Demam Berdarah Dengue (DBD). *Jurnal Kedokteran Dan Kesehatan: Publikasi Ilmiah Fakultas Kedokteran Universitas Sriwijaya*, *10*(3), 267–274. https://doi.org/10.32539/JKK.V10I3.21425

Sambou, C. N. (2022). Tanaman Herbal yang Memiliki Aktivitas Antipiretik. *Majalah InfoSains*, *3*(2), 81–85. Google Scholar

Sharma, N. (2011). *Ministry of Health Annual report 2011*.Google Scholar

Sugiyanto, Z., Insyira, Y. C., Ernawati, E., Novendriani, P., Fhadil, F., & Nurul, S. H. (2024). Accuracy of diagnostic codes for Dengue Hemorrhagic Fever patients based on anamnesis and supporting examinations in 10 Central Java Hospitals. *Procedia of Engineering and Life Science*, *6*(4), 145–149. https://doi.org/https://doi.org/10.21070/pels.v6i0.1968

Sutriyawan, A., Yusuff, A. A., Adi, P., No, J. N., & Bandung, K. (2022). Analysis of Dengue Hemorrhagic Fever Epidemiological Surveillance System (DHF): Mixed Method Study. *Jurnal Manajemen Kesehatan Yayasan RS.Dr. Soetomo*, *8*(1), 137–150. Google Scholar

Tayal, A., Kumar, S., & Rakesh, K. (2023). Management of Dengue : An Updated Review. *Indian Journal of Pediartics*, *90*(February), 168–177. https://doi.org/10.1007/s12098-022-04394-8

Wang, W., Nayim, A., Chang, M. R., Assavalapsakul, W., Lu, P., Chen, Y., & Wang, S. (2020). ScienceDirect Dengue hemorrhagic fever e A systemic literature review of current perspectives on pathogenesis , prevention and control. *Journal of Microbiology, Immunology and Infection*, *53*(6), 963–978. https://doi.org/10.1016/j.jmii.2020.03.007

WHO. (2009). Dengue Guidelines For Diagnosis, Treatment, Prevention And Control. *World Health Organization*. Google Scholar

WHO. (2011). *Comprehensive guidelines for prevention and control of dengue and dengue haemorrhagic fever*. WHO. Google Scholar

Wulan, F. W., Astuti, L. W., Rilawati, F. D., & Syam, A. F. (2024). Evaluasi Rasionalitas Insulin Pada Pasien Diabetes Mellitus Tipe 2 Rawat Jalan di RSUD Kota Madiun Periode 2022. *Termometer: Jurnal Ilmiah Ilmu Kesehatan Dan Kedokteran*, *2*(3). https://doi.org/https://doi.org/10.55606/termometer.v2i3.4054

Zulfa, S. N. I. (2023). Relationship of Knowledge , Role of Managers , and Availability of Waste Bins with Seller ' s Participation in Waste Management in Pasar Umum Caruban. *Jurnal Teknologi Lingkungan*, *24*(2), 183–189. Google Scholar