



(RESEARCH ARTICLE)



Analysis of the effectiveness of bed occupation rate capacity in Dengue Hemorrhagic Fever (DHF) disease nursing services at Kendari City Hospital, Southeast Sulawesi Province, Indonesia, 2024

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Abstract

Background: Dengue Hemorrhagic Fever (DHF) is one of the health problems that often require intensive care in hospitals. Bed Occupation Rate (BOR) capacity is an important indicator in measuring the efficiency and quality of hospital services, especially in nursing services. Non-ideal BOR can affect the effectiveness of services, especially in handling DHF patients who require special attention. In handling DHF, Kendari City Public Hospital often faces a surge of patients in certain seasons, especially during an outbreak. This surge can affect nursing services, which play an important role in supporting patient recovery. The effectiveness of nursing services is strongly influenced by the availability of beds, the ratio of nurses to patients, and the hospital's ability to manage BOR capacity efficiently. This study is important to analyze the effectiveness of BOR capacity management in nursing services for dengue fever in kendari city public hospital. By understanding the dynamics of BOR and nursing services, it is expected that optimization strategies can be found that not only improve the operational efficiency of the hospital but also the quality of care for DHF patients.

Methods: This study used a qualitative approach with an exploratory descriptive design. Data were collected through in-depth interviews with nursing staff, hospital management, and patients or their families. In addition, secondary data regarding the BOR rate and the number of DHF patients were analyzed to provide context. Data analysis was conducted using thematic techniques.

Results: The results showed that the BOR rate at Kendari City Hospital often exceeded the ideal limit (>85%) during the peak season of DHF cases. The BOR level significantly affects the quality of care. A BOR that is too high can reduce the quality of care due to excessive workload, while a BOR that is too low causes resources not to be optimally utilized. To effectively treat DHF patients, hospitals need to ensure that the BOR is within the optimal range while keeping additional resources ready to handle the surge in cases during the outbreak season. This results in increased nurse workload, limited time for individualized care, and decreased patient satisfaction. Despite this, nursing staff apply various adaptive strategies to maintain service quality, such as teamwork and prioritization of critical patients. Under high bed occupancy rate (BOR) conditions, providing optimal care to dengue fever patients requires good management and effective collaboration among health workers. Hospital management also sought temporary capacity additions during the surge, although challenges in resource allocation remained.

Conclusion: High BOR capacity affects the effectiveness of nursing services for DHF patients at Kendari City Hospital. Optimizing bed capacity management and increasing the ratio of nursing staff are important steps to improve service quality. This study provides recommendations for hospital management to develop long-term strategies to deal with the surge of DHF patients.

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Keywords: Bed Occupation Rate; DHF; Nursing Services; Effectiveness

1. Introduction

Dengue fever is an infectious disease that is often found in tropical countries, including Indonesia. DHF can cause severe symptoms, such as high fever, joint pain, nausea, and can even lead to life-threatening complications. In severe cases, DHF patients often require hospitalization. In the face of increasing dengue cases, hospitals need to manage bed capacity effectively in order to provide optimal services to dengue patients. (1)

Dengue Hemorrhagic Fever (DHF) is an infectious disease transmitted by the *Aedes aegypti* mosquito and often causes an increased burden on health care facilities, especially in hospitals. As the highest referral facility in the health care system in Indonesia, type hospitals have a great responsibility in handling DHF cases that require intensive care.

Bed Occupation Rate (BOR) capacity is one of the indicators used to measure the effectiveness of bed capacity management in hospitals. BOR refers to the percentage of bed utilization within a certain period of time. Bed Occupation Rate (BOR) capacity is one of the important indicators in measuring the efficiency and effectiveness of bed management in hospitals. The ideal BOR set by the Indonesian Ministry of Health is 60-85%. A BOR that is too low (<60%) indicates suboptimal resource utilization, while a BOR that is too high (>85%) can lead to a decrease in service quality due to excessive workload, long waiting times, and possible patient overload.(2)

The use of BOR in DHF services has several potential benefits. Firstly, by monitoring BOR, hospitals can obtain information on bed capacity utilization rates and identify the need for additional beds if needed. Second, BOR can help in planning human resources and logistics, such as medical personnel and equipment, so that hospitals can handle the surge of DHF cases more efficiently. Third, an effective BOR can help reduce patient waiting time and improve patient satisfaction. However, further research needs to be done to assess the actual effectiveness of using BOR in DHF services.

Some factors that need to be considered in this analysis are the number of DHF cases, severity of illness, duration of hospitalization, and other relevant factors. In addition, it is also necessary to look at the impact of BOR on service quality, such as adherence to DHF treatment protocols and the quality of care provided to patients. By conducting a study on the effectiveness of bed occupation rate in DHF services, it is expected to provide better insight into the use of BOR in this disease-specific context. The results of this study are expected to contribute to the development of more effective and efficient bed capacity management strategies in treating DHF patients.(3)

In the management of DHF, kendari city public hospital often faces a surge of patients in certain seasons, especially during an outbreak. This surge can affect nursing services, which play an important role in supporting patient recovery. The effectiveness of nursing services is strongly influenced by the availability of beds, the ratio of nurses to patients, and the hospital's ability to manage BOR capacity efficiently.

This study is important to analyze the effectiveness of BOR capacity management in nursing services for dengue fever in kendari city public hospital. By understanding the dynamics of BOR and nursing services, it is hoped that optimization strategies can be found that not only improve hospital operational efficiency but also the quality of care for DHF patients.(4)

Hospitals at this time have developed into a very complex organization. It is said to be complex because in a hospital there are various problems brought by hospital visitors or patients, and the hospital is also a labor-intensive organization with a variety of different educational backgrounds, and there are various treatment facilities and various equipment available.

In general, a hospital is built to provide treatment and healing services to patients on an outpatient and inpatient basis. Especially related to this inpatient service, various supporting services are held which take care of various housekeeping and administrative activities.hospitals have duties and functions based on law No. 44 of 2009 concerning hospitals. The task of the hospital is to carry out health service efforts in an efficient and effective manner by prioritizing healing and recovery which is carried out in harmony and integrated with improvement and prevention and implementation of referral efforts, hospitals also have the task of providing comprehensive individual health services.(5)

2. Methods

This study used a qualitative approach with an exploratory descriptive design. Data were collected through in-depth interviews with nursing staff, hospital management, and patients or their families. In addition, secondary data regarding the BOR rate and the number of DHF patients were analyzed to provide context. Data analysis was conducted using thematic techniques.

3. Results and discussion

This study had a total sample of 64 respondents, the sample taken was all nurses who worked at the Kendari City Regional General Hospital with a length of work of more than 6 months. The characteristics of respondents include profession, gender, age, last education, and tenure of nurses in the inpatient room at the Kendari City Regional General Hospital in 2024.

This study has a total sample of 64 respondents, the sample taken is all nurses who work at the Kendari City Regional General Hospital with a length of work of more than 6 months. The characteristics of respondents include the number of nurses 64, Gender The first category is male as many as 21 respondents (32.8%), and the second is female as many as 43 respondents (67.2%), Age of respondents with age groups are in the age group 25-30 years, namely 16 respondents (25.0%) and the age group 31-35 years, namely 20 respondents (31.2%) and the age group 36-40 years, namely 28 respondents (43.8%), The last education of respondents who have D3 education is 27 respondents (42, 2%), D4 education is 1 respondent (1.6%), while those with Ners education are 15 respondents (23.4%) and those with S1 education are 20 respondents (31.2%), and S2 education is 1 respondent (1.6%), and the tenure of nurses in the Inpatient Room at the Kendari City Regional General Hospital in 2024 respondents who worked for 1-10 years were 47 (73.4%), while those who worked for 11-20 years were 17 (26.6%).

4. Researcher Variable

4.1. Bed Occupation Rate (BOR) capacity at Kendari City Hospital

Based on the results of observations and in-depth interviews, it is known that currently the capacity of the Kendari City Hospital Bed Occupation Rate is still not optimal, for example when there is a surge in DHF cases: During the rainy season, dengue cases usually increase. This can cause BOR to increase, especially in referral hospitals such as type A. Availability of Medical Human Resources: A high BOR is only optimal if supported by adequate medical personnel. And in case of Overcapacity: if the BOR exceeds 85%, patients will experience treatment delays and must be referred to other hospitals. Furthermore, the space is not well managed, for example if DHF patients are treated in a room that does not meet the standards, such as an emergency room or hallway, it indicates pressure on the facility so the RSUD must expand capacity such as adding beds, especially in the infection room. This is supported by the following interview results:

"..... to treat Dengue Fever (DHF) patients depends on several factors, such as the number of DHF cases that are occurring, the number of beds available, and other medical resources. An optimal BOR indicates efficient use of beds without overburdening the hospital. The ideal standard according to the Indonesian Ministry of Health is 60-85%. A BOR below 60% indicates underutilization (excess capacity), while a BOR above 85% could indicate high pressure on the facility.

There have been many studies on the relationship between bed capacity and the treatment of DHF patients. Some of the results are as follows:

Study in Referral Hospitals in Indonesia: A study in Indonesia found that hospitals with a limited number of beds faced difficulties in handling the surge of DHF patients, especially during the peak season. This leads to delayed treatment and increased risk of complications in patients (Yulia et al., 2017).

Shepard et al. (2013) This study examined the impact of health infrastructure on mortality from DHF in various endemic countries. The results showed that health facilities with sufficient bed capacity had lower mortality rates than facilities that lacked capacity (6)

Research by Murray et al. (2015) In a study on dengue outbreak management, Murray noted that the availability of beds in emergency departments and isolation wards plays an important role in reducing the spread of nosocomial infections and providing optimal care to patients(7)

4.2. BOR affects service quality

The level of BOR significantly affects the quality of care. A BOR that is too high can reduce the quality of care due to excessive workload, while a BOR that is too low leads to resources not being optimally utilized. With a low BOR, the efficiency of bed capacity is not optimal and hospital resources are not well utilized, which can increase operational costs without providing significant benefits to patients. To effectively treat DHF patients, hospitals need to ensure that the BOR is within the optimal range while maintaining readiness of additional resources to handle spikes in cases during the outbreak season. This is supported by the following interview results:

"... Yes, the level of Bed Occupancy Rate (BOR) can directly affect the quality of services provided to Dengue Fever (DHF) patients in the hospital. Too high BOR (>85%) has an impact on the quality of service, where the fatigue of health workers such as doctors, nurses, and hospital staff can experience excessive workload, which has the potential to reduce concentration and efficiency in dealing with patients.

4.3. Implication of Theory in the Linkage of BOR and Services

Health Care Systems Theory (Donabedian, 1988) : According to this theory, the quality of health services is influenced by three main elements: structure, process, and outcome. BOR as part of the structure element directly affects the service process (such as speed of care and patient satisfaction). Too high BOR can disrupt the service process and reduce the quality of outcomes, including the mortality rate of DHF patients. Capacity and Efficiency Theory This theory emphasizes that the efficiency of hospital operations depends on the optimal use of resources. Too low a BOR indicates inefficiency, while too high a BOR causes an imbalance between demand and capacity. In the context of DHF, this imbalance can worsen the severity of the patient and prolong the hospitalization period (8)

4.4. High BOR impacts workload or stress in providing nursing care

A high BOR does increase the workload and stress of nursing staff, which in turn can affect the quality of care. Therefore, hospital management needs to ensure adequate resource allocation and support the welfare of nurses so that they can provide optimal care to patients. Nurses often have to work overtime or take additional shifts when BOR is high, which can disrupt work-life balance. This can lead to burnout if not addressed. This is supported by the following interview results:

"..... Yes, a high Bed Occupancy Rate (BOR) can directly impact the workload and stress levels of nursing staff. Where the impact of high BOR on workload and nurse stress is an increase in workload where the nurse-patient ratio is not ideal: A high BOR often means that nurses have to handle more patients than the ideal number. This can lead to less personalized care and prolong response times to patient needs. Increased Administrative Duties: In addition to caring for patients, nurses are also responsible for medical documentation, inter-team coordination, and patient needs management, which adds up as the number of patients spikes.

Research showed that high BOR in DHF referral hospitals in Central Java is directly related to increased nurse workload. In this condition, nurses have to handle more patients with limited treatment time, thus experiencing stress due to work demands that exceed their capacity(9)

Nantsupawat et al. (2017) Research in Thailand found that a high BOR leads to an increase in the patient-nurse ratio, which has implications for job burnout. This reduces nurses' ability to provide quality care, especially during dengue outbreaks.

Aiken et al. (2012) This study revealed that increased workload due to high BOR increases the risk of occupational stress by 40%. Stressed nurses are likely to make clinical errors, which can jeopardize patient safety.

Specific Study on DHF Outbreak : in a DHF endemic area showed that during a surge in cases, high BOR resulted in nurses working longer hours with irregular working hours. This has a negative impact on nurses' psychological conditions, such as anxiety and emotional exhaustion (1)

4.5. Steps that can be taken to manage BOR capacity

Effectively managing bed occupancy rate (BOR) capacity is key to ensuring optimal nursing care, especially for patients with dengue fever. steps that can be taken to manage BOR capacity to support services: Optimizing Bed Management, Adding Temporary Capacity, Strengthening Human Resources, Technology and Information Systems. By effectively managing BOR capacity through strategic measures such as optimization of resources, use of technology, and

community education, hospitals can be better prepared for the surge in dengue cases. The main focus is to ensure that patients get timely care, and health workers are not overburdened (3)

5. Conclusion

High BOR capacity affects the effectiveness of nursing services for DHF patients at Kendari City Hospital. Optimizing bed capacity management and increasing the ratio of nursing staff are important steps to improve service quality. BOR is an important indicator that affects the quality of service in the management of DHF patients. Too high BOR can lead to decreased quality of care, increase the risk of complications, and prolong patient waiting time. This study provides recommendations for hospital management to develop long-term strategies in dealing with the surge of DHF patients. The availability of beds in health facilities has an important role in the management of DHF patients, especially during the outbreak season. bed capacity should be a major concern in health system planning in DHF endemic areas. health services show that good BOR management, through capacity planning and triage systems, is essential to ensure DHF patients get optimal care.

Suggestion

Suggestions for BOR Capacity Management:

- **Bed Utilization Optimization:** Hospital management can implement a real-time monitoring system of BOR to anticipate spikes in cases more efficiently.
- **Temporary Facility Additions:** During the peak season of dengue cases, hospitals may consider adding temporary bed capacity to reduce pressure on BOR.
- **Strengthen cooperation with other referral hospitals** in the surrounding area to distribute patients when the BOR at Kendari City Hospital is close to maximum capacity

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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