

Barber Johnson Graph Efficiency Analysis

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Abstract

The purpose of this research is to inform barber johnson graph efficiency analysis. This research method uses descriptive. The population and samples used are the entire census of inpatients from 2019 to 2021 at Siti Khodijah Muhammadiyah Gurah Pare Hospital. Data collection techniques are using, observing, interviewing, and counting. The data analysis technique used is by using the barber johnson formula. The results show that the calculation and analysis of the barber johnson graph efficiency 2019 to 2021 at Siti Khodijah Muhammadiyah Gurah Pare Hospital shows that the use of treatment bed at Siti Khodijah Muhammadiyah Gurah Pare Hospital is still not efficient, it is said to be inefficient because the meeting point of the 4 parameters barber johnson graph 2019 to 2021 is outside the efficient area, due to a reduction in bed resulting in the bed occupancy rate value also decreasing.

Keywords

barber johnson; efficiency; bed



I. Introduction

Hospitals provide comprehensive and most complex services than other health care facilities. Health care facilities have an obligation to provide health services in accordance with their respective main objectives. In addition, it also has an administrative obligation to create and maintain patient medical records. This is confirmed in several regulations and laws, for example the Medical Practice Law Number 29 of 2004 Article 46 Paragraph 1, which states that every doctor or dentist in carrying out medical practice is required to make medical records (Budi, 2011:1-2).

According to the Minister of Health Regulation Number 269 of 2008 concerning medical records, medical records are files that contain notes and documents about patient identities, examinations, treatments, actions and other services that have been provided to patients at health care facilities (Hosizah, 2014).

A medical recorder must have competence, one of which is health statistics, where medical recorders are expected to be able to use health statistics to produce quality information and estimates as a basis for planning and decision-making in the field of health services. One of the statistical activities in hospitals is managing data to compile reports on service efficiency at health service facilities. This activity aims to monitor bed usage activities in inpatient service units. Patient beds need to get great attention from hospital management because as a place for patient care, it needs to be arranged in order to obtain efficient use (Indriani and Sugiarti, 2014). The higher the company's leverage, the company tends to generate less cash, this is likely to affect the occurrence of earning management. Companies with high debt or leverage ratios tend to hold their profits and prioritize the fulfillment of debt obligations first. According to Brigham and Ehrhardt (2013), the greater the leverage of the company, it tends to pay lower dividends in order to reduce dependence on external funding. So that the greater the proportion of debt used for

the capital structure of a company, the greater the number of liabilities that are likely to affect shareholder wealth because it affects the size of the dividends to be distributed. (Yanizzar, et al. 2020)

Utilization of beds in hospitals should be efficient from the economic and medical aspects. To unify these two aspects, an appropriate parameter is needed, namely bed occupancy ratio, average length of stay, turn over interval, and bed turn over. Presenting the four parameters, a method can be used, namely the barber-johnson chart, where we can see the efficiency level of bed utilization in hospitals clearly and the four parameters are brought together in one point (Susilo and Nopriadi, 2012).

In monitoring and assessing the efficiency level of bed use, four inpatient indicators are used, namely bed occupancy ratio, average length of stay, turn over interval, and bed turn over. The four indicators are presented in the form of a barber johnson chart. The Barber Johnson chart is a chart that formulates and combines four parameters to monitor and assess the efficiency level of bed use for patient care wards (Sudra, 2010).

From the results of initial observations at the Siti Khodijah Muhammadiyah Gurah Pare Hospital, it is a type D hospital with a capacity of 71 beds. In 2019, the bed occupancy ratio value was 70.03%, average length of stay 3.05 days, turn over interval 1.95 days, bed turn over 5.2 times. In 2020, the bed occupancy ratio value was 43%, average length of stay 4.53 days, turn over interval 4 days, bed turn over 0.42 times. In 2021 the bed occupancy ratio value was 47%, average length of stay 3.41 days, turn over interval 4 days, bed turn over 2.74 times. Based on these data, it can be seen that the bed occupancy ratio at Siti Khodijah Muhammadiyah Gurah Pare Hospital has decreased and is not yet efficient. According to barber johnson, it is said to be efficient if the values of the four indicators are bed occupancy ratio 75%-85%, average length of stay 3-12 days, turn over interval 1-3 days, bed turn over more than 30 times (Sudra, 2010).

The calculation of the barber johnson chart reporting at the Siti Khodijah Muhammadiyah Gurah Pare Hospital has been carried out since 2018 directly by the reporting staff of the medical record unit. This report is done manually using Excel on a computer from the results of seminars and trainings from the hospital but has never been evaluated regarding the results of the barber johnson graph. Regarding the calculation of the barber johnson chart, it is only a calculation of the number of inpatient census patients and there is no evaluation and depiction of the Barber Johnson chart as well as an analysis of the high or low of a curve from this figure based on the four barber johnson chart indicators (Rustiyanto, 2010).

The purpose of this study was carried out as a general goal, namely, to identify bed efficiency based on the barber johnson chart for 2019-2021 at Siti Khodijah Muhammadiyah Gurah Pare Hospital. As for the specific objectives, namely, calculating 4 barber johnson chart indicators consisting of bed occupancy ratio, average length of stay, turn over interval, and bed turn over, knowing the comparison of bed use efficiency in 2019-2021 and analyzing the barber johnson chart to determine the efficiency of bed use in 2019-2021.

The reason why this topic is important to be published is, with this study we can analyze the use of beds in a hospital as outlined in the barber johnson graph to see how effective the use of the bed is. From the results of barber johnson's graph, we can also analyze and evaluate the use of beds to improve the quality of service in hospitals.

This research also contributes to the quality of service in a hospital, if the quality of hospital services increases it will make patient visits also increase so that the hospital will benefit and the community will not choose the wrong hospital.

The purpose of this research is to inform barber johnson graph efficiency analysis.

II. Research Method

This research method uses descriptive. Descriptive research method is a research characteristic that reveals more specifically about various social and natural phenomena found in people's lives (Octiva et al., 2018; Pandiangan, 2018). Specific in its definition, it is intended to mention aspects of the relationship, impact and completion of research activities (Asyraini et al., 2022; Octiva, 2018; Pandiangan, 2015). The goal of descriptive research is to describe a phenomenon and its characteristics. This research is more concerned with what rather than how or why something has happened. The characteristics used to describe the situation or population are usually some kind of categorical scheme also known as descriptive categories. For example, the periodic table categorizes the elements. Scientists use knowledge about the nature of electrons, protons and neutrons to devise this categorical scheme.

Population is the complete set group of individuals, whether that group comprises a nation or a group of people with a common characteristic (Jibril et al., 2022; Pandiangan et al., 2018; Pandiangan, 2022). The total number of people living in a particular area in a particular time is known as the population. The population is one of the important factors which helps to balance the environment, the population should in a balance with the means and resources. Sample refers to a smaller, manageable version of a larger group. It is a subset containing the characteristics of a larger population (Octiva et al., 2021; Pandiangan et al., 2021; Pandia et al., 2018). In research terms a sample is a group of people, objects, or items that are taken from a larger population for measurement. The sample should be representative of the population to ensure that we can generalise the findings from the research sample to the population as a whole. The population and samples used were the entire census of inpatients from 2019 to 2021 at Siti Khodijah Muhammadiyah Gurah Pare Hospital.

Data collection techniques are using, observing, interviewing, and counting. Observing, interviewing, and counting are three methods of collecting qualitative data as part of research. Tools are used by academic researchers and in fields such as market research.

The data analysis technique used is by using the barber johnson formula. The barber johnson graph is a graph that can visually clearly present the level of efficiency in terms of the quality of medical services and the utilization of existing facilities (Pandiangan et al., 2022; Tobing et al., 2018).

III. Result and Discussion

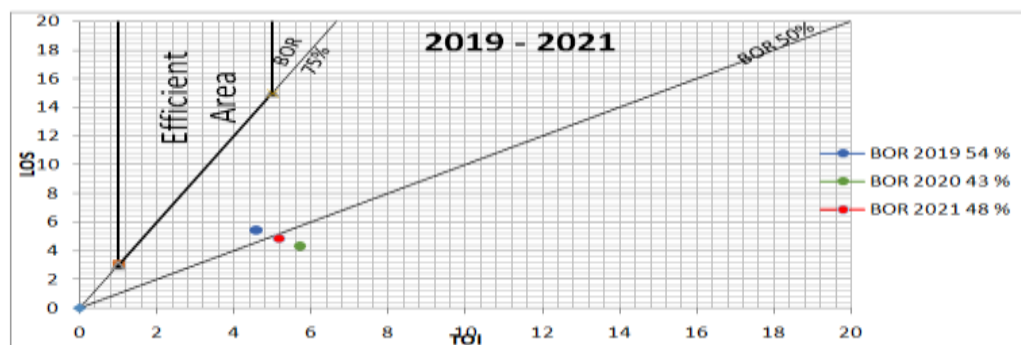


Figure 1. Barber Johnson Graph Efficiency of Siti Khodijah Muhammadiyah Gurah Pare Hospital

Barber Johnson graph efficiency 2019 to 2021 at Siti Khodijah Muhammadiyah Gurah Pare Hospital:

1. In 2019 the percentage of bed use was 54%, which means it is not efficient, the average length of time the patient is treated is 4 days which means it is efficient, the interval of bed use is 4 days so it is not efficient, while the frequency of bed use is 46 times and it is efficient.
2. In 2020 the percentage of bed use is 43% which means that it is not efficient, the average length of time the patient is treated is 4 days which means it is efficient, the interval of bed use is 3 days so that it is efficient, while the frequency of bed use is 46 times and has been efficient.
3. In 2021 the percentage of bed use is 48% which means that it is not efficient, the average length of time the patient is treated is 4 days which means it is efficient, the interval of bed use is 4 days so it is not efficient, while the frequency of bed use is 46 times and it is efficient.

Table 1. Indicator Calculation Results of Siti Khodijah Muhammadiyah Gurah Pare Hospital

Indicator	Depkes Formula Calculation			GBJ Formula Calculation		
	2019	2020	2021	2019	2020	2021
BOR	54%	43%	48%	54%	43%	48%
AvLOS	4 Days	3 Days	4 Days	4 Days	3 Days	4 Days
TOI	4 Days	4 Days	4 Days	4 Days	4 Days	4 Days
BTO	46 Times	46 Times	46 Times	46 Times	46 Times	46 Times

Calculating 4 barber johnson indicators for 2019 to 2021:

3.1 Bed Occupancy Rate (BOR)

BOR is a percentage of the use of available beds in a certain period. It is said to be efficient if the BOR value is 75%-85%, while the bed usage rate at Siti Khodijah Muhammadiyah Gurah Pare Hospital in 2019 is 54%, in 2020 it is 43%, and in 2021 it is 48%. Judging from the results of the 2019-2021 BOR, according to barber johnson's theory, the 2019-2021 BOR has not met the standard, which means that the beds used to treat patients are few compared to the beds provided.

3.2 Average Length of Stay (AvLOS)

AvLOS is the average length of stay for a patient. It is said to be efficient if AvLOS is 3-12 days. The average length of stay for patients at Siti Khodijah Muhammadiyah Gurah Pare Hospital in 2019 was 4 days, in 2020 it was 3 days, and in 2021 it was 4 days. Judging from the 2019-2021 AvLOS results, it meets the standards according to barber johnson's theory.

3.3 Turn Over Interval (TOI)

TOI is the average number of vacant beds or the average number of available beds in a certain period that is not filled between patients leaving or dying and patients entering. It is said to be efficient if the TOI is 1-3 days. The TOI figure at Siti Khodijah Muhammadiyah Gurah Pare Hospital in 2019 was 4 days, in 2020 it was 4 days, and in 2021 it was 4 days. Judging from the 2019-2021 TOI results, it does not meet the standards according to barber johnson's theory, which means that the rotation of the use of old beds and long intervals.

3.4 Bed Turn Over (BTO)

BTO is the frequency of using a bed several times in a certain time unit (usually 1 year). It is said to be efficient if the BTO is > 30 times. The frequency of bed use at Siti Khodijah Muhammadiyah Gurah Pare Hospital in 2019 was 46 times, in 2020 it was 46 times, and in 2021 it was 46 times. Judging from the results of the 2019-2021 BTO, it meets the standards according to barber johnson's theory, which means that the bed is often used and the change in bed usage is fast. This research is constrained by inpatient data, monthly inpatient census data must be collected first and only calculated into one year, so that future researchers must recap the census data of previous inpatients.

From the explanation above, the calculation and analysis of the barber johnson graph efficiency 2019 to 2021 at Siti Khodijah Muhammadiyah Gurah Pare Hospital shows that the use of treatment bed at Siti Khodijah Muhammadiyah Gurah Pare Hospital is still not efficient, it is said to be inefficient because the meeting point of the 4 parameters barber johnson graph 2019 to 2021 is outside the efficient area, due to a reduction in bed resulting in the BOR value also decreasing.

IV. Conclusion

The results show that the calculation and analysis of the barber johnson graph efficiency 2019 to 2021 at Siti Khodijah Muhammadiyah Gurah Pare Hospital shows that the use of treatment bed at Siti Khodijah Muhammadiyah Gurah Pare Hospital is still not efficient, it is said to be inefficient because the meeting point of the 4 parameters barber johnson graph 2019 to 2021 is outside the efficient area, due to a reduction in bed resulting in the bed occupancy rate value also decreasing.

For suggestions, hospitals should make efforts to improve the quality of services by improving marketing strategies and hospital promotions. If the quality-of-service increases and the marketing strategy is also good, patient visits will increase and the bed occupancy rate value will also increase so that the use of beds will be efficient.

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