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Unit Cost Analysis in Heart Failure Inpatients Using the Time Driven Activity Based Costing Method at Type D Hospital in Sragen

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ABSTRACT

Background: Heart failure is one of the most common non-communicable diseases in adults. The number of cases of patients admitted to hospitals due to heart failure is quite large, resulting in a high frequency of hospitalizations and high patient treatment costs. Cost calculation is very important for health care providers in order to conduct financial evaluations. One way to calculate costs in hospitals is to use unit cost analysis. The purpose of the study was to determine the unit cost of treatment for heart failure patients in inpatient settings, especially in Type D hospitals in Sragen.
Subjects and Method: This study is a qualitative type study using a case study approach to unit cost to calculate the inpatient treatment rate of patients with chronic heart failure using the Time Driven Activity Based Costing method. Furthermore, the difference with the INA CBGs rate is seen. There are two sources of data in this study, namely primary data from interview results from sources directly in the field and secondary data from financial report data and clinical pathway data for inpatient services for patients with chronic heart failure in hospitals.
Results: The unit cost of treatment of heart failure patients in the inpatient installation using the Time Driven Activity Based Costing method at type D hospitals in Sragen amounted to Rp 2,186,089. The difference in heart failure treatment costs in the type D hospital inpatient installation in Sragen using the Time Driven Activity Based Costing method with the patient treatment rate based on INA-CBG'S is Rp 250,211 (10%).
Conclusion: The unit cost of treatment of heart failure patients in the inpatient installation using the Time Driven Activity Based Costing method is Rp 2,186,089.

Keywords: chronic heart failure, unit cost, time driven activity based costing

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BACKGROUND

Coronary heart disease and heart failure are among the most common non-communicable diseases in adults. According to the AHA, the prevalence of heart failure tends to increase recently, it is estimated that there are about 6.2 million adults over the age of 20 affected by heart failure in the US. This figure includes an increase when compared to the previous results, namely in 2009-2012,

which was 5.2 million people. The prevalence of heart failure in the population in Europe and America ranges from 1-2% while in Indonesia the prevalence is higher, reaching 5% of the total population (Reyes et al., 2016).

The number of cases of patients who are hospitalized due to heart failure is quite large so that this disease is often associated with the high frequency of hospitalization due to the long treatment. The length of patient treatment is very important considering that hospital treatment can have a direct and indirect impact on the cost of patient care (Djaya et al., 2015).

In Indonesia, hospital financing involves personal payments or insurance under JKN, which uses the INA CBGs system. Managing costs is crucial, especially for high-risk, high-cost procedures (Dumaris, 2015). Hospitals collaborating with BPJS Health face challenges with limited INA CBGs packages, particularly in type D hospitals, where patient numbers continue to rise (Prameswari et al., 2022).

To improve the quality of health services, understanding cost calculations is very important for health care providers. If costs and outcomes are not calculated in detail, it will be difficult for healthcare providers to conduct evaluations (Akhavan et al., 2016). One way to calculate costs in hospitals is to use analysis unit cost (unit fee). Analysis unit cost is an activity to calculate the amount of hospital costs based on the type of service available. There are various methods in the calculation unit cost, i.e. traditional methods, Activity Based Costing (ABC) and Time Driven Activity Based Costing.

Disadvantages of cost-based calculations Activity Based Costing Among them, the interview and survey process takes a long time and is expensive, besides that the data for the ABC model will be difficult to validate because it is subjective. The weakness of the ABC method is what then gave rise to a new method, namely Time Driven Activity Based Costing (Kaplan and Anderson, 2007).

Time Driven Activity Based Costing is a calculation method that estimates the cost of an activity based on the unit cost to supply the capacity and time needed to perform the service in question (Chen et al., 2015). This method is a new model of the ABC model. The breakthrough of TD ABC lies in the estimated time. This method uses time as a cost driver for the cost object. In a complex environment where the time required to perform an activity is driven by multiple triggers, TD ABC can include multiple triggers for each activity. There are two parameters used in the TD ABC method, namely the cost of the resource unit and the time and quantity of resources needed to carry out transactions or activities (Allin et al., 2019). According to Kaplan and Anderson (2007) this method is easier to apply compared to the conventional ABC method.

Although it has only recently been developed, this method is already widely used in various sectors such as retail, manufacturing, financial services and has recently started to be used in the health sector (Erhun et al., 2015). The TD ABC method is very useful in estimating costs and values from the side of clinical services so that it is used in health services to generate information about costs from various aspects of treatment. Details of financing in all phases of the patient care cycle can be found out through TD ABC (Balakrishnan et al., 2015). Some of the health services of surgical installations in hospitals such as BPH surgery (Benign Prostatic Hyperplasia) (Kaplan et al., 2015) and some outpatient services such as chronic disease patient care have tried using this method and shown promising results (Keel et al., 2020).

One of the hospitals in Sragen Regency, namely the type D hospital in Sragen, is a type D hospital that already has 24-hour Emergency Installation (IGD) facilities, ICU, operating room, inpatient and outpatient consisting of polyclinics of internal medicine, pediatrics, obstetrics, surgery, cardiology, orthopaedics, eyes, nerves and psychiatry. This hospital was established in 2018 where this hospital has excellent services in the heart and blood vessels. This hospital only collaborated with BPJS in May 2020. One of the problems that exists in this hospital is the lack of unit costs which causes hospitals to still have difficulties in determining tariffs. Heart cases are one of the most common cases in this hospital. Heart disease that is included in the most diseases of inpatient services at type D hospitals in Sragen is a case of chronic heart failure. The purpose of the study was to determine the unit cost of treatment for heart failure patients in inpatient settings, especially in Type D hospitals in Sragen.

SUBJECTS AND METHOD

1. Study Design

The type of study used in this study is qualitative using the case study method. The type of study used in this study is qualitative using the case study method. The purpose of this study is to analyze unit costs related to heart failure using the Time Driven Activity Based Costing method at type D hospitals in Sragen. The study was conducted at a type D hospital in Sragen in May-June 2024.

2. Study Informants

The subjects of this study are parties who have a relationship with heart failure services at Saras Ibnu Sina Sukowati Sragen Hospital, namely inpatients with a total of 2723 patients. The object of this study is all activities and activities carried out in the service, with the accidental sampling technique of heart failure patients case study obtained 1 patient in the inpatient installation at Saras Ibnu Sina Sukowati Sragen Hospital.

3. Variables

The variables used in this study are heart failure, unit cost, time driven activity based costing, activities, and cost drivers.

4. Operational Definition

Heart failure is a condition in which the heart is unable to pump enough blood throughout the body which is usually characterized by symptoms of shortness of breath during activity, swelling of the legs and fatigue

Unit cost is the cost calculated for a unit of product or service in the treatment of inpatients with heart failure.

Time Driven Activity Based Costing is a method used in calculating costs. This method has two parameters, namely the estimated cost per unit (tariff) of capacity in a certain department (capacity cost rate) and the estimated amount of time consumed by an activity.

Activities are activities carried out in an organization or in a work process.

Cost drivers are a factor that can cause changes in activity costs.

5. Study Instrument

The study utilized various tools and documentation to gather data on the procedure for handling inpatients with chronic heart failure at a Type D Hospital in Sragen. Financial data related to patients in the inpatient unit with a diagnosis of chronic heart failure were collected through documentation review. A stopwatch was employed to measure the duration of each activity within the procedure. Additionally, interviews were conducted with relevant stakeholders using prepared interview guidelines and recording devices to capture detailed insights. Observation guidelines were also used to facilitate direct observation of activities involved in the inpatient care process for patients with heart failure.

6. Data Analysis

The data analysis in this study uses primary data and secondary data. Primary data is obtained directly in the field by conducting interviews and observations. Secondary data was obtained from financial report data containing rates per class of inpatients with heart failure, income data, data on monthly expenses at Type D Hospital in Sragen Sragen. In this study, interviews were conducted with cardiovascular specialists, inpatient unit heads and ward nurses to get an overview of the activities and the amount of time required in inpatient services for heart failure patients.

Secondary data in this study are in the form of clinical pathways, inpatient services for heart failure patients, and financial records of Type D Hospital in Sragen Sragen. From the results of primary and secondary data collection, the next step is to process data on inpatient services for heart failure patients. The data obtained will then be analyzed using the Time Driven Activity Based Costing (TDABC) method.

RESULTS

Unit cost analysis using the Time-Driven Activity-based Costing (TDABC) method using 7 appropriate steps. The analysis process is as follows:

1. Select the medical condition

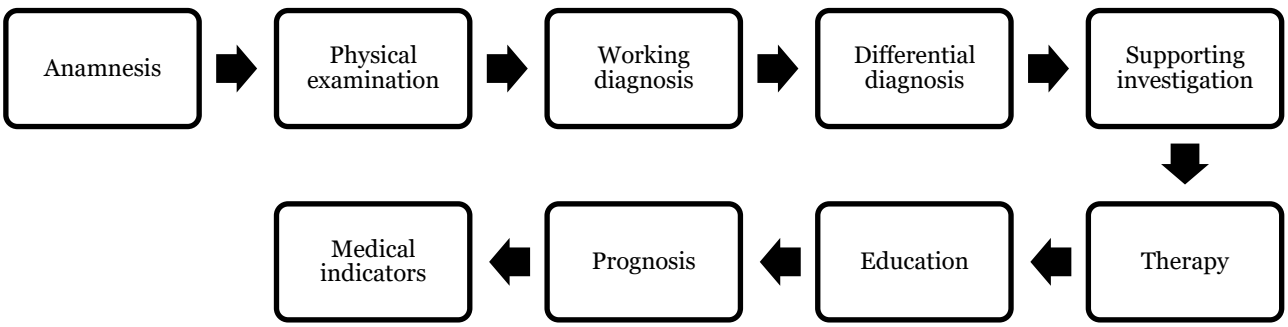
A medical condition is defined as a collection of patients whose circumstances are best treated in a coordinated manner. The medical condition in this study was a patient being treated for heart failure in an inpatient unit at a type D hospital in Sragen.

2. Define the care delivery value chain (CDVC)

The service activity of heart failure patients starts from activities in the Heart Poly which is where patient registration is entered. Then register for inpatients by filling out the form done at the Inpatient Patient Registration Center (TPPRI). After the registration process is completed, the patient is then hospitalized. The patient was taken to the Inpatient Installation which was then inpatient.

3. Develop process maps for each activity in patient care delivery

A process map should be developed for each activity in the CDVC, and should include all relevant resources required for each step of the process Activities in the treatment of heart failure patients in the inpatient setting and the length of the examination obtained based on interviews and observations can be observed in the following diagram. This is in accordance with the standard operational procedures that apply at type D hospitals in Sragen.



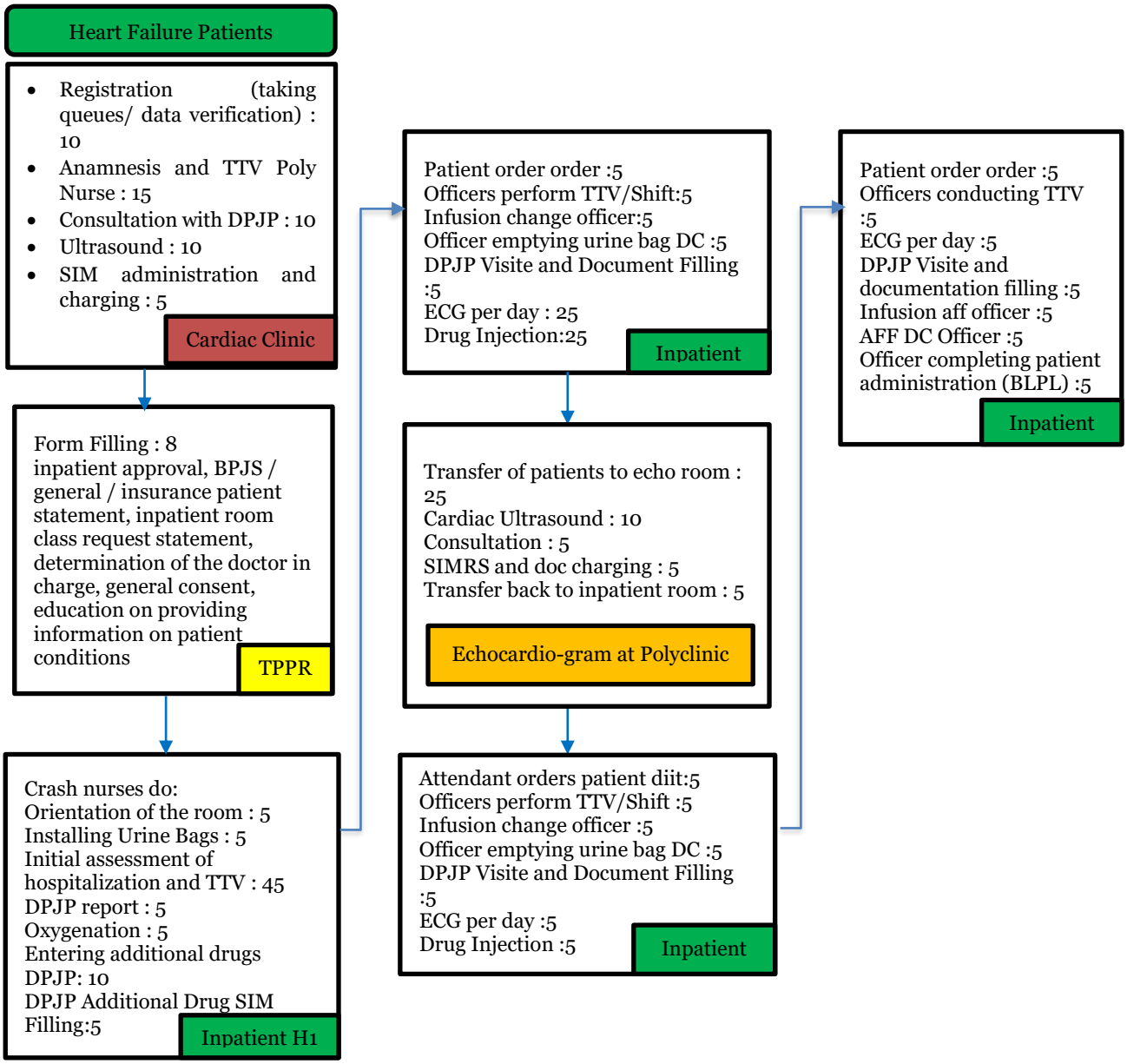


Figure 1. Heart Failure Process Map

4. Obtain time estimates for each process

Activities in the treatment of heart failure patients in the inpatient setting and the length of examination time obtained based on interviews and observations are described in the following table.

Table 1. Activity Center for the Care of Heart Failure Patients in Inpatient Installations

Location of Activity	It	Activity Details	Time/ Minutes
		Patients coming in from the Poly	
Registration	1	Registration (taking queues, verifying data)	10
Cardiac Clinic Poly	2	Anamnesis and TTV Poly Nurse	15
	3	Consultation with DPJP	10
	4	ULTRASOUND	10

Location of Activity	It	Activity Details	Time/ Minutes
TPPRI	5	Administration (writing SPRI etc by DPJP) and filling in the RS SIM	5
	6	Form filling: a. Hospitalization Consent b. BPJS/general/insurance patient statement c. inpatient room class request statement d. Determination of the Doctor in Charge e. General Consent f. Education g. Provision of information on the patient's condition	8
Inpatient Room (H1)	7	Inpatient nurses do: a. Space orientation b. the officer installed a DC urine bag c. Initial assessment of hospitalization and TTV d. report to the DPJP e. Oxygenation f. Entering additional drugs for DPJP	 5 5 45 5 5 10
	8	RS SIM charging & documentation	5
	9	The officer ordered the patient's diit	5
	10	Officers conduct TTV/shift	5
	11	Infusion replacement officer	5
Day 2 Crash	12	Officer emptying the DC urine bag	5
	13	DPJP website and document filling	5
	14	ECG per day	25
	15	Drug injection	25
Echocardio-gram (at the Cardiac Polyclinic)	16	Transfer patients to the Echo room	25
	17	Cardiac Ultrasound	10
	18	Consultation	5
	19	RS SIM Charging and Documentation	5
	20	Transfer back to the inpatient room	5
	21	The officer ordered the patient's diit	5
	22	Officers conduct TTV/shift	5
	23	Infusion replacement officer	5
Day 3 Crash	24	Officer emptying the DC urine bag	5
	25	DPJP website and document filling	5
	26	ECG per day	5
	27	Drug injection	5
	28	The officer ordered the patient's diit	5
Inpatient-Day 4	29	Officers conduct TTV	5
	30	ECG per day	5
	31	DPJP Visite and filling in documentation	5

Location of Activity	It	Activity Details	Time/ Minutes
	32	AFF infusion officer	5
	33	AFF DC Officer	5
	34	Patient administration completion officer (BLPL)	5

5. Estimates the cost of supplaying patient care resources

a. Indirect resources

Indirect costs are costs that arise from a number of service units that are inter-dependent on each other but are not used directly. Supporting units include directors, medical services and support units, finance, medical records, human resources, information, public relations and marketing. The cost of the supporting unit will be allocated to the production unit. Basically, indirect cost determination uses the same principle as direct cost determination, namely calculating investment costs, operational costs, and maintenance costs. Indirect resource costing is the allocation of indirect costs to activities in proportion. Non-functional units include non-clinical units such as the board of directors and administrative staff. The indirect costs of this study are:

Table 2. Indirect Costs

Cost	Total
Service Administration and Operations	IDR 1,187,673,715
Administration and Office Services	IDR 348,071,913
Service Support Salary Costs, etc.	IDR 584,857,271
Equipment Depreciation	IDR 420,112,500
Building Depreciation	IDR 72,630,926
Electricity Costs	IDR 407,351,460
Sanitation Costs	IDR 152,783,551
Total	IDR 3,173,481,336
Number of Inpatients	2.723
Total Indirect	IDR 1,165,436

Indirect costs in this study were calculated:

a) Service Administration and Operational Costs

Consists of the cost of speedy, telephone, office stationery, garage rental, photocopier, projector rental.

b) Administrative Fees and Office Services

Consisting of laboratory costs, consumption, fuel, maintenance and repair, vehicle rental, equipment rental, building rental, parking, KSO laboratory

c) Service Support Salary Costs, etc.

Consists of RM and Management cost burden

d) Equipment Depreciation

It is obtained from the calculation of the depreciation of work tools and production machines that are burdens during the expected useful life.

e) Building Depreciation

Obtained from the calculation of building depreciation

f) Electricity Costs

Calculation of electricity cost load in 1 year

g) Sanitation Costs

Calculation of sanitation cost burden in 1 year.

In Table 4.5., it can be seen that the cost of spending a type D hospital in Sragen is Rp. 3,173,481,336. Furthermore, the cost of treating heart failure patients is divided by all inpatients as many as 2,723 patients so that a result of Rp 1,165,436 is obtained for each patient treatment.

b. Direct Resources

Direct resources are direct resources that allocate indirect costs to activities through a cause-and-effect relationship between the resources consumed and the activities produced. *Direct resources* in this study consist of 1) Personnel and location costs, 2) Total Laboratory costs and 3) Total ABHP Drug and Diet costs. Here are the details of the cost calculation.

Table 3. Personnel and Location Costs

Clinical Pathway	Heart Failure Patient Care
Screening	IDR 98,793.00
TPPRI	IDR 5,054.00
RANAP Day 1	IDR 58,476.00
DAY 2 NAP	IDR 59,049.00
Echocardiogram (at the Cardiac Polyclinic)	IDR 83,043.00
DAY 3 NAP	IDR 57,061.00
RANAP Day 4	IDR 57,061.00
Total cost	IDR 418,986.00

Direct costs are obtained from the calculation of personnel and location costs, including costs allocated to each human resource in accordance with the activities carried out. The total cost of personnel and location is Rp 418,986.00. The cost of heart failure treatment based on the calculation of personnel and location costs in detail shows a screening fee of Rp 98,793.00, the cost at TPRRI is Rp 5,054.00. The cost of the 1st and 2nd day of inpatient care is Rp 58,476.00 and Rp 59,049.00. The cost of Echocardiogram (at the Cardiac Polyclinic) is Rp. 83,043.00 while the 3rd and 4th day of inpatient care is Rp. 57,061.00 and Rp. 57,061.00. The total laboratory cost for heart failure patients is Rp 284,000.00 (Table 4).

Table 4. Total Laboratory Costs

No.	Case	Laboratory Fees
1	Hematology Hema 5 diff	IDR 100,000.00
2	Blood Sugar	IDR 35,000.00
3	Blood Chemistry of Creatinin	IDR 50,000.00
4	Rapid Antigen Test (General)	IDR 99,000.00
	Total Lab Fees :	IDR 284,000.00

Table 5. Total Drug and BHP Costs

No	DRUGS and BHP	Purchase Price	Sum	Total Price
1	ID Blue Band Adult One Med (BMJP) 1	IDR 960	1	IDR 960
2	10cc BD Syringe (BMHP 1)	IDR 2,424	9	IDR 21,816

No	DRUGS and BHP	Purchase Price	Sum	Total Price
3	3cc BD Syringe (BMHP 1)	IDR 1,212	7	IDR 8,484
4	Abbocarhh 22 Terumo Flash (BMHP 3)	IDR 11,946	1	IDR 11,946
5	5cc PD Syringe (BMHP 3)	IDR 1,292	10	IDR 12,920
6	3cc PD Syringe (BMHP 3)	IDR 1,211	3	IDR 3,633
7	Adult Nasal Canal (BMHP 3)	IDR 10,100	1	IDR 10,100
8	Threeway GP Care (BMHP 3)	IDR 9,595	1	IDR 9,595
9	GP Care Pediatric Infusion (BMHP 3)	IDR 7,070	1	IDR 7,070
10	Biosprlolol 2, SMG Tab Dexa (Patent 1)	IDR 136	8	IDR 1,088
11	Codein 20MG Tab (Patent 1)	IDR 1,986	20	IDR 39,720
12	Ranitidin 50 MG INJ Mersi (Patent 1)	IDR 1,069	6	IDR 6,414
13	Acetysteine 200MG Novell Tab (Patent 1)	IDR 617	25	IDR 15,425
14	Simvastatin 200MG Sampharindo Tab (Patent 1)	IDR 171	5	IDR 855
15	Clopidogrel 75MG Tab KF (Patent 1)	IDR 598	8	IDR 4,784
16	CeftriaxoneSodium IG INJ Interbat (Patent 1)	IDR 5,045	8	IDR 40,360
17	Aminophlline INJ Phyridam (Patent 1)	IDR 12,721	4	IDR 50,884
18	RL 500cc Inf Sanbe (Patent 1)	IDR 8,582	3	IDR 25,746
19	Ranitidine 150MG Tab HJ (Patent 1)	IDR 210	10	IDR 2,100
20	Ranitidin 50MG INJ Mersi (Patent 1)	IDR 2,803	6	IDR 16,818
21	Furosemide INJ IPHA (Patent 1)	IDR 1,515	5	IDR 7,575
22	Nitrokaf Retard Tb (Patent 1)	IDR 1,672	10	IDR 16,720
23	Salbutamol 4 MG Tab Yrd (Patent 1)	IDR 177	15	IDR 2,655
	Total Drugs and BHP			IDR 317,668

BHP and drug costs are costs obtained from the cost of consumables, medicines and patient food. The total cost of drugs and consumables for heart failure treatment is Rp 317,668.

Table 6. Direct Resources

No.	Cost	Total
1.	Personnel and location costs	IDR 418,986
2.	Total Laboratory Costs	IDR 284,000
3.	Total Cost of ABHP Medication and Diet	IDR 317,668
	Total Direct	**IDR 1,020,654**

Based on the table above, the direct resources for cardiac failure treatment delivery are Rp 1,020,654.

6. Estimate the capacity of each resource and calculate the capacity cost rate

The next step in calculating unit costs using Time-Based Activity Based Costing (TDABC) is to allocate overhead costs for each activity. Calculating unit costs using the Time-Driven Activity-Based Costing (TDABC) method is to charge overhead costs into each activity. The step in determining the time of each task and determining the allocated CCR is done by multiplying the Personal Capacity Cost Rate (CCR) with the number of personnel, one example of the

calculation is the number of laboratory personnel consisting of 1 personnel multiplied by the CCR cost of Rp 557 and the total CCR of Rp 557 is obtained. As for the time involved, it is 30 minutes. The next step is to multiply the total CCR by the time involved and get an allocated CCR of Rp 2,786.

7. Calculate the total cost of patient care

CCR each resource by the duration of usage in each activity, and add up the cost of each activity to get the cost of a process. The cost of each process is added up to produce the cost of the entire treatment cycle of patients with these medical conditions (Keel et al., 2017). The final stage in the unit cost model Time-Driven Activity-Based Costing (TDABC) is to sum the overhead costs, which can be seen in the following table:

Table 7. Unit Cost Model Time-Driven Activity-Based Costing (TDABC)

No.	Cost	Heart Failure Treatment
1	Indirect Fees	IDR 1,165,436
2	Direct Fees	IDR 1,020,654
3	Total Services	IDR 2,186,089

Based on the table above, it is known that the Unit Cost rate of the Time-Driven Activity-Based Costing (TDABC) model based on calculations with the actions of heart failure patients is Rp 2,186,089.

Table 8. Otal Heart Failure Patient Cost

Source	Total	Percentage
HR Costs and Location	IDR 418,986	19%
Laboratory	IDR 284,000	13%
Drug and BHP Costs	IDR 317,668	15%
Indirect Costs	IDR 1,165,436	53%
Total Cost	IDR 2,186,089	100,0%

Based on the data above, it is known that the total cost of treatment for heart failure patients is Rp 2,186,089 and the BPJS claim rate obtained by the hospital is Rp 2,436,300.00, with a difference of 10%.

8. Real Cost of Heart Failure Patients at Type D Hospital in Sragen

The Real Cost of heart failure patients at type D hospitals in Sragen by class is as follows:

Table 9. Heart Failure Patient Treatment Rates

CHF Patient Claims (BPJS)		
CLASS I	CLASS II	CLASS III
IDR 3,240,200.00	IDR 2,838,200.00	IDR 2,436,300.00

Table 10. TDABC Real Cost and Unit Cost

Types of Examinations	INA CBGS	Unit cost model TDABC	Difference
Heart Failure Treatment	IDR 2,436,300.00	IDR 2,186,089	10%

DISCUSSION

1. Unit Cost of Treatment of Heart Failure Patients in Inpatient Installations using the Time Driven Activity Based Costing Method at Type D Hospital in Sragen.

The ABC method evolved and refined into Time Driven Activity Based Costing (TDABC) to overcome the weaknesses contained in ABC. According to Kaplan and Anderson, TDABC is a revolutionary method of calculating costs because it results in calculations that are more accurate, practical, easy to develop, faster and better for making decisions, more time-saving and cost-effective, and more effective (Kaplan and Anderson, 2007).

Hospitals must develop clinical pathways outlined in operational procedures to achieve a clear patient management process. Information about activities recorded during the clinical process is recorded, measured, and used as basic data. Clinical pathway-based unit costing impacts cost reduction through activity management by eliminating non-value-added activities (Astuti et al., 2021). Based on the results of the analysis, it is known that unit cost inpatient heart failure patients at type D hospitals in Sragen are as IDR 2,186,089. The study conducted by this researcher is relevant if you consider the study conducted showing that the results of the calculation of Unit Cost (unit cost) cardiac outpatient services at dr. Slamet Garut Hospital, resulting in a total unit cost of Rp 1,672,986, based on the total unit cost any service product. The result of the calculation of Unit Cost (unit cost) outpatient services for cardiac diagnosis at dr. Slamet Garut Hospital with the (ABC)-based method Clinical Pathway, resulting in a clinical pathway implementation format in which there are details of unit costs (unit cost) for example, for 1 patient who is outpatient at the heart polyclinic for 5 days, with a total cost breakdown of IDR 4,256,780.

Study by Kumalasari et al. (2019), explained that the budget allocated by BPJS for outpatients with coronary heart diagnoses and heart failure through INA-CBGs, in general, is sufficient for the patient's direct treatment costs for seven (7) days of treatment. Drug costs are the highest component of financing medical costs compared to other components. The analysis of unit costs is closely related to the issue of health service prices related to government health financing. The determination of the price of a health service is based on many factors, one of the important factors is the price of the unit of services needed.

Therefore, the problem of health financing in Indonesia, especially in the government hospital sector, is a problem in this cost analysis study. Activity-based costing is a cost information system that aims to provide comprehensive information about activities so as to enable company employees to manage activities. This information system is based on operations as well as cost reduction and accurate determination of product/service costs as the purpose (Javid et al., 2015).

2. Difference in Heart Failure Treatment Costs in Type D Hospital Inpatient Installation in Sragen using the Time Driven Activity Based Costing method with Patient Care Rates based on INA-CBG'S

The difference calculated between the real cost applied by the hospital and the calculation using the TDABC method for heart failure patients in the Inpatient Installation is Rp 250,211 (10%). Based on the data above, it shows that the calculation of the unit cost of heart failure patients at type D hospitals in Sragen gives a lower difference compared to the real cost. Thus, in accordance with the TDABC calculation, the

results of each clinical flow have been managed quite efficiently and radical improvements are not needed. However, a more accurate analysis of activities and resources is needed to help incremental development.

The results of research conducted by (Haq et al., 2023) that is The cost of elective cesarean section with the TDABC method is IDR 4,576,182.72. Based on the results of the study, TDABC can analyze costs based on services well and identify inefficient processes. Study conducted by (Wardani and Personal, 2023) which shows that the results of the CS unit cost analysis using the TDABC model are Rp 4,421,217.04. The difference between INA-CBG claims and CS unit cost using the TDABC model is IDR 553,983 (11%).

Study conducted by (Firizqina, 2023) which indicates that the difference in loss for the action Sectio Caesarea at RSI Kendal between the existing tariff and INA-CBG's claim when viewed from the calculation results unit cost action Sectio Caesarea in Kendal RSI using model-based calculations Time Driven Activity-Based Costing (TDABC) with the act of childbirth Sectio Caesaria Non-ERACS amounted to Rp 303,773.07 (6%) and childbirth with Sectio Caesaria ERAS amounted to IDR 707,537.17 (14%). The similarity of the study with this study is using TDABC calculations. The difference between the study is that the calculation is based on the model Time Driven Activity-Based Costing (TDABC) with the act of childbirth Sectio Caesaria and this study Perform model-based calculations Time Driven Activity-Based Costing (TDABC) with cases of heart failure patients.

The results of this study show a different percentage difference from previous studies. Studies conducted by previous studies by (Astuti et al., 2021) which shows that there is a difference in tariffs with a negative value of -40,158,430 with an average difference of -573,691 ± 2,825,013. The hospital rate is 16% larger than the Ina CBGs rate, so there is a considerable negative difference. This negative tariff difference can have a loss impact on hospitals. In the JKN program, hospitals have the opportunity to take advantage of the difference in claims that have a positive value. However, if the services provided are not effective and efficient, it will have an impact on the negative difference in claims so that it can become a threat to the hospital's financial management (Mardiah, 2016).

Accurate cost calculation is very important for hospital management so that hospital income is not too high so that it burdens patients, nor is it too low so that it affects hospital profits for patients. We know that the goal of private hospitals is not only to provide medical services but also to make a profit in order to thrive and survive in the market (Pramitasari, 2021).

Furthermore, to overcome the shortcomings of the Activity-Based Costing (ABC) method, Kaplan and Anderson (2007) developed and refined it into a method Activity-Based Costing (TDABC) based on time. TDABC is a revolutionary costing method because it produces simpler, more accurate, easy-to-develop, and time-saving cost calculations than the ABC method. Time-Based Activity Based Costing (TDABC) uses only two parameters in its implementation, namely the total cost of each activity resource unit and the duration of each activity carried out (Faizaturruhaniah, 2022).

Study conducted by Shankar et al. (2020) showed that the TDABC method had a good effect on the operation and workflow of the radiology department. Radiologists need to understand the steps involved in cost accounting in order to be able to deliver therapy appropriately and cost-effectively.

The TDABC method also has an important role in decision-making in health operational systems. This method is also known to have provided many benefits compared to other financing methods.

This study concluded that the unit cost of treatment for heart failure patients in the inpatient installation using the Time Driven Activity Based Costing method at type D hospital in Sragen amounted to Rp 2,186,089. The difference in heart failure treatment costs in the type D hospital inpatient installation in Sragen using the Time Driven Activity Based Costing method with the patient treatment rate based on INA-CBG'S is Rp 250,211 (10%).

AUTHOR CONTRIBUTION

Aulia Nadhiasari, Firman Pribadi, and Ietje Nazaruddin are researchers who chose the topic, collected data, analyzed the data and wrote the manuscript.

CONFLICT OF INTEREST

There was no conflict of interest in the study.

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