Cost Analysis of Pulp Disease Treatment Using the Activity-Based Costing Method at XY Kajen Hospital

Analisis Biaya Pengobatan Penyakit Pulpa Menggunakan Metode Activity-Based Costing di Rumah Sakit XY Kajen

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ABSTRACT

Background: Dental pulp disease was the case with the highest prevalence at the Dental Clinic of XY Kajen Hospital. The main constraint in root canal treatment was the high procedural cost, which led to low patient acceptability.

Objective: This study aimed to analyze and calculate the unit cost of dental pulp disease treatment at the Dental Clinic of XY Kajen Hospital using the Activity-Based Costing (ABC) method as a basis for rational tariff determination. Additionally, a comparative analysis of the Cost Recovery Rate (CRR) was conducted among JKN tariffs, the Double Distribution (DD) method, and the ABC method.

Methods: This study employed a field study design with a qualitative descriptive approach. Primary data were collected through direct observation, in-depth interviews, and documentation review, while secondary data were obtained from the hospital information system. Data analysis was conducted systematically through the stages of data reduction, data presentation, and conclusion verification.

Results: Unit cost analysis using the ABC method showed that the current general tariffs were lower compared to the ABC calculation results, and for some types of procedures, they were even lower than the INA-CBGs tariff package. These findings indicated that there were cost components and cost drivers that had not been comprehensively calculated in conventional tariff setting. In response to the low INA-CBGs CRR, hospital management implemented a cost containment strategy for service operational cost efficiency.

Conclusion: The ABC method proved to be a valid analytical instrument for cost evaluation and strategic tariff setting in hospitals, as it was able to present resource cost allocation more accurately and transparently compared to conventional methods.

Keywords: Activity-Based Costing, Clinical Pathway, Dental Pulp Disease, Unit Cost

ABSTRAK

Latar Belakang: Penyakit pulpa gigi merupakan kasus dengan prevalensi tertinggi di Poli Gigi XY Kajen Hospital. Kendala utama perawatan saluran akar adalah tingginya biaya prosedur yang menyebabkan rendahnya akseptabilitas pasien.

Tujuan: Penelitian ini bertujuan untuk menganalisis dan menghitung unit cost tindakan penyakit pulpa gigi di Poli Gigi XY Kajen Hospital menggunakan metode Activity-Based Costing (ABC) sebagai dasar penetapan tarif rasional. Selain itu, dilakukan analisis komparatif Cost Recovery Rate (CRR) antara tarif JKN, metode Double Distribution (DD), dan metode ABC.

Metode: Penelitian ini menggunakan desain studi lapangan dengan pendekatan deskriptif kualitatif. Data primer dikumpulkan melalui observasi langsung, wawancara mendalam, dan telaah dokumentasi, sedangkan data sekunder diperoleh dari sistem informasi rumah sakit. Analisis data dilakukan secara sistematis melalui tahapan reduksi data, penyajian data, dan verifikasi kesimpulan.

Hasil: Analisis unit cost menggunakan metode ABC menunjukkan bahwa tarif umum yang berlaku saat ini lebih rendah dibandingkan hasil perhitungan ABC, dan pada beberapa jenis prosedur bahkan lebih rendah dari paket tarif INA-CBGs. Temuan ini mengindikasikan adanya komponen biaya dan cost driver yang belum terhitung secara komprehensif dalam penetapan tarif konvensional. Sebagai respons terhadap rendahnya CRR INA-CBGs, manajemen rumah sakit menerapkan strategi cost containment untuk efisiensi biaya operasional pelayanan.

Kesimpulan: Metode ABC terbukti dapat menjadi instrumen analisis yang valid untuk evaluasi biaya dan penetapan tarif strategis di rumah sakit, karena mampu menyajikan alokasi biaya sumber daya secara lebih akurat dan transparan dibandingkan metode konvensional.

Kata Kunci: Activity-Based Costing, Clinical Pathway, Penyakit Pulpa Gigi, Unit Cost

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INTRODUCTION

Hospitals as referral healthcare facilities had the obligation to provide comprehensive medical services, including dental and oral health care. Dental and oral health services were an integral part of specialist services in hospitals. Based on the Government Regulation of the Republic of Indonesia Number 17 of 2023 concerning Health article (1), dental and oral health services were conducted in the form of dental health promotion, dental disease prevention, dental disease treatment, and dental health recovery, which were implemented by the Central Government, Regional Government, and/or the community (President of RI, 2023).

Data from the 2023 Indonesian Health Survey (SKI) showed that 57% of Indonesia's population experienced dental and oral health problems. Although there was a decrease compared to Riskesdas 2018, the dental health condition of the community still required serious attention, especially in children and elderly age groups (KEMENKES RI, 2023).

At XY Kajen Hospital, data from the past three years showed that the most visits to the Dental Clinic were dominated by pulp diseases, with root canal treatment being the most frequently performed procedure. The majority of patients were participants of the National Health Insurance (JKN). However, there was a significant gap in service pricing determination. Based on the Regent of Pekalongan Regulation No. 65/2022, the tariff for root canal treatment for general patients was set at Rp163,000, while the claim for JKN patients through the INA-CBGs package reached an average of Rp291,600, resulting in a difference of Rp128,600 between the general patient tariff using the Double Distribution method and the INA-CBGs tariff for JKN patients.

This tariff gap indicated a misalignment in the cost calculation method for services. As a BLUD (Regional Public Service Agency), XY Kajen Hospital had the obligation to set tariffs based on unit cost according to Permendagri No. 79/2018 and KMK No. HK.01.07/MENKES/346/2025. The Activity-Based Costing (ABC) method was recommended because it was more accurate in identifying service activities and cost allocation based on resource consumption compared to the Double Distribution method (KMK RI No. HK.01.07/MENKES/346/2025, 2025).

Previous research showed that the Activity-Based Costing (ABC) method was more efficient and realistic compared to conventional methods because it was capable of identifying activities in detail and allocating costs based on cost drivers that were actually used in each service. With this approach, unit cost calculation became more accurate, especially for complex procedures such as root canal treatment. Conversely, conventional methods tended to distribute costs evenly without considering differences in resource usage intensity, thus often producing cost distortions. The implementation of the ABC method provided a stronger foundation in hospital tariff formulation, increased cost transparency, and supported more accurate managerial decision-making (MP Zifi, ZA Renaldo, 2020).

Pulp necrosis was a condition where the dental pulp was already dead, blood vessel flow was absent, and the pulp nerve did not function again. Fully necrotic pulp caused the tooth to be asymptomatic until symptoms arose due to disease process development into periradicular tissue. Most pulp necrosis occurred due to complications from acute and chronic pulpitis that did not receive adequate treatment (Nisha Garg, 2019).

According to Walton as cited by Sibarani, the classification of pulp diseases included reversible pulpitis, irreversible

pulpitis, hyperplastic pulpitis, and pulp necrosis (Kartinawanti & Asy'ari, 2021):

1. Reversible pulpitis: Mild to moderate pulp inflammation due to noxious stimuli such as incipient caries, cervical erosion, occlusal attrition, incorrect operative procedures, deep periodontal curettage, or enamel fracture that exposed dentin tubules.
2. Irreversible pulpitis: Pulp inflammation due to bacterial invasion that could not be recovered, generally being a continuation of untreated reversible pulpitis.
3. Hyperplastic pulpitis: A form of irreversible pulpitis known as pulp polyp, characterized by proliferation of young pulp tissue with adequate vascularization and open area for drainage.
4. Pulp necrosis: A condition of dead pulp with loss of blood flow and nerve function. Clinically the tooth was often asymptomatic, sensitivity test response was negative on single-rooted teeth, and varied on multi-rooted teeth. Radiographically showed normal periapical tissue if infection had not spread (Etiologi et al., 2014).

SKI 2023 data showed a decrease in dental and oral health problems by 0.5% compared to Riskesdas 2018, as well as a decrease in DMF-T index across all age groups. However, the index remained high in children aged 3-5 years and the age group ≥35 years. Increased public awareness and government funding support had encouraged more visits to dental health services (Kemenkes RI, 2018).

The majority of Dental Clinic visits were patients with dental pulp disease, with an average percentage in the past three years of 56.87% (2022), 58.11% (2023), and 54.64% (2024). As a healthcare institution, XY Kajen Hospital needed to determine appropriate service tariffs to meet patient needs while maintaining hospital operational sustainability.

At that time there was a striking difference in service tariffs between general patients and JKN patients. Based on the Regent of Pekalongan Regulation Number 65 of 2022, the tariff for dental pulp disease treatment for general patients was set at Rp163,000, while the payment claim for JKN patients with INA-CBGs tariff had an average of Rp291,600, producing a difference of Rp128,600. This tariff difference indicated a gap between the general patient tariff calculation method that used the Double Distribution method and the JKN claim tariff that used the INA-CBGs package system.

XY Kajen Hospital in determining service tariffs had to be guided by the Decree of the Minister of Health of the Republic of Indonesia No. HK.01.07/MENKES/346/2025 concerning Guidelines for Calculation of Service Unit Costs in Hospitals which stated in CHAPTER II that the calculation of service unit costs used the Activity Based Costing method.

This study aimed to analyze and calculate the unit cost of dental pulp disease treatment procedures at the XY Kajen Hospital Dental Clinic using the Activity Based Costing (ABC) method compared with the Double Distribution method as a basis for more accurate tariff determination. Through unit cost calculation with both methods, this study examined the differences in results and compared the Cost Recovery Rate (CRR) level between the ABC method, the Double Distribution method, and the INA-CBGs tariff package. The results of this analysis were expected to provide a more accurate picture of the service cost structure, so that it could be used as a reference in determining fair tariffs, improving operational efficiency, and supporting more transparent, sustainable, and quality-

oriented dental health service management at XY Kajen Hospital.

METHODS

A. Research Design

This study used a quantitative approach with field research methods to analyze the unit cost of dental pulp disease treatment using the Activity Based Costing (ABC) method. The analysis results were used as a basis for rate determination and to compare the Cost Recovery Rate of the INA CBGs outpatient package with the applicable general rates.

B. Population and Sample

The research population consisted of employees at XY Kajen Hospital, Pekalongan Regency. The sample included dentists, head of medical support, tariff team, case mix, registration department, laundry, IPSRS, finance, and other personnel involved in the care of patients with dental pulp disease.

C. Data Collection Techniques

Primary data were collected through interviews, direct observation at the dental clinic (May-June 2025), and measurement of time, costs, and procedures. Secondary data were obtained from Clinical Practice Guidelines, Clinical Pathways, financial data, inventory, and related literature.

Data collection steps included:
1. Identification of all Facility Activities at the XY Kajen Hospital dental clinic
2. Observation of the dental clinic service flow
3. Identification of direct and indirect costs
4. Identification of all cost drivers
5. Data processing using ABC method formulas with MS Excel
6. Discussion of results with management and medical staff
7. Analysis of calculation results and interviews.

D. Research Instruments

The instruments used included observation guidelines, interviews, documentation, and unit cost calculation tables using the ABC method from admission to patient discharge.

E. Data Analysis Techniques

Data analysis was conducted through data reduction (selection of observation, interview, and documentation results), descriptive and structured data presentation, and drawing conclusions based on the presented data.

RESULT AND DISCUSSION

In calculating the unit cost, the initial step was to identify the cost driver through observation of patient service flow from arrival to discharge based on the Clinical Pathway at XY Kajen Hospital. Observation was also conducted on Clinical Pathway compliance in dental pulp disease treatment, which provided structured service standards from diagnosis to treatment completion.

The ABC method enabled more accurate unit cost calculation by reflecting the actual cost of each activity according to the Clinical Pathway. Implementation of this method improved cost transparency and served as a basis for evaluating service efficiency and determining fairer tariffs at the Dental Clinic of XY Kajen Hospital.

Clinical management of dental pulp disease was selected based on the degree of tooth tissue damage and the severity of pulp inflammation caused by caries. The range of treatments included restoration (filling) for superficial caries or early dentin cases, pulp capping or pulpotomy for pulp exposure or reversible inflammation that still allowed for vitality preservation, root canal treatment (RCT) for cases of irreversible pulpitis or pulp necrosis, and extraction when tooth structure damage, loss of periodontal tissue support, or

conservative prognosis was so poor that tooth retention was no longer feasible.

A minimally invasive approach was emphasized in modern dental practice. When possible, tissue conservation and vital pulp therapy (direct/indirect pulp capping or pulpotomy) were prioritized as they could maintain function and delay or avoid RCT, while RCT indications remained strong for irreversible radicular inflammation. Therapeutic decisions were also influenced by patient factors (age, systemic condition, compliance), anatomical tooth conditions (lesion depth, restorative access), and anticipated long-term success based on recent evidence, including studies showing high success rates for selective pulpotomy procedures in certain cases and guidelines supporting selective strategies in caries removal. Therefore, the logical decision pathway from filling → pulp capping/pulpotomy → RCT → extraction reflected the gradient of caries severity and pulp compromise as well as the principle of tissue preservation when clinical prognosis allowed (Farhadian et al., 2024; Colloc & Tomson, 2025).

After conducting observations about the treatment pathway and developing a schema for unit cost calculation, the facility activities involved in dental clinic services were identified. Additionally, all cost drivers and types of services, both primary and secondary care services, were identified.

Based on the analysis, cost driver data indicated that root canal treatment procedures represented the highest time and frequency burden, as they involved multiple visits and stages, including devitalization, canal preparation, obturation, and follow-up control. Activities requiring lengthy durations per visit, such as obturation (±15 minutes) or tooth extraction (±20 minutes), constituted the primary drivers of high costs due to their substantial consumption of clinical labor and disposable materials. Although activities such as instrument preparation and communication, information, and education (CIE) required minimal time per occurrence, their high frequency still contributed significantly to overhead cost allocation.

These findings were consistent with recent research applying Activity-Based Costing methods to dental healthcare services, which demonstrated that the highest unit costs generally originated from complex procedures involving multiple stages and repeated material usage. The ABC method helped identify the most influential cost components, enabling management to discover efficiency opportunities through schedule optimization, reduction of non-productive time, or selection of more economical materials without compromising service quality (Zang et al., 2023).

Table 1. Facility Activity Costs for Dental Pulp Treatment

No	Type of Service	Cost (in rupiah)
1	Medical Record Services	807.391
2	Building and Facility Maintenance	1.666.666
3	Laundry Services	543.913
4	Security Services	107.098
5	Cleaning Service Medical Waste Management	524.074
6	Administrative and Management Services	4.099.538
7	Electricity and Water Usage (Utilities)	2.681.692

Table 2. Table of direct costs consisting of material costs, labor costs, and equipment costs (in rupiah) for dental pulp disease cases

No	Procedure	Material Costs	Labor Costs	Equipment Costs	Total Direct Costs
1	Permanent Depreciation				
	Visit I	69.895	18.466	147	88.509
2	Pulp Caping				
	Visit I	96.850	23.326	16.496	136.672
	Visit II	98.910	21.382	15.128	135.420
3	Root Canal Treatment				
	Visit I	164.970	9.719	6.843	181.533
	Visit II	143.210	12.635	8.873	164.718
	Visit III	143.210	17.494	12.256	172.960
	Visit IV	143.210	16.522	11.579	171.311
	Visit V	143.210	16.522	10.903	170.635
4	Tooth Extraction				
	First Visit	28.618	14.579	9.137	52.334
	Visit II	28.618	4.860	3.097	36.574

Based on the direct cost calculation using the Activity-Based Costing (ABC) method, the components of material costs, personnel costs, and equipment costs showed significant variation across types of procedures and visit stages. Root canal treatment had the highest cumulative total direct cost because it involved five visits with relatively constant material costs (±Rp143,210 per visit), but was accompanied by variations in personnel and equipment costs. The direct cost at the first visit for this procedure reached Rp181,533, while the fifth visit was Rp170,635. Permanent filling procedures at the first visit showed a total direct cost of Rp88,509, most of which came from material and personnel cost components. Meanwhile, the pulp capping procedure showed significant variation in direct costs between the first visit (Rp136,672) and the second visit (Rp135,420), reflecting differences in complexity and resource utilization. Tooth extraction procedures at the first visit required a cost of Rp52,334, higher than the second visit (Rp36,574) due to differences in duration and procedure intensity. These findings indicated that the largest costs in dental pulp disease services were generally influenced by the number of procedure stages and high material

consumption in restorative and endodontic procedures (Wigsten E, Fransson H, 2024).

These findings were consistent with recent research in dental service cost management using the ABC method, which showed that procedures with multiple visit stages and long duration such as root canal treatment became major contributors to unit costs due to high requirements for disposable materials, clinician time, and use of special equipment (Kinanti et al. (2022), Perintis et al. (2023).

In addition, ABC research on dental services in teaching hospitals showed that personnel costs were the largest component, followed by material costs, while equipment costs tended to vary depending on the complexity of the procedure (Lasah et al., 2024). Thus, the application of the ABC method in this study was able to identify the most influential activities and cost components, which could serve as the basis for efficiency recommendations through optimization of material use, work schedule arrangements, and selection of more cost-effective technology without reducing service quality.

The cost structure showed that the largest allocation of indirect costs was dominated by physical assets (buildings and equipment), which influenced the cost

per unit of service through the *Activity-Based Costing* method. These results were consistent with the study by Rahmasari et al. (2022) at the Dental Hospital of Andalas University, which demonstrated that building and equipment depreciation components often constituted the largest proportion of indirect costs in ABC-based *unit cost* calculations (Rahmasari et al., 2022).

The research by Chompu-inwai & Puangla (2024) also confirmed that overhead cost allocation from physical assets significantly influenced the cost per procedure, especially for procedures requiring special facilities and equipment such as root canal treatment. When asset depreciation was high, the *unit cost* of procedures became larger despite relatively efficient material and labor costs, making transparency in BTL calculations important for managerial decision-making. Thus, these results confirmed that asset management and facility utilization efficiency had a direct impact on service cost optimization, particularly in the context of multi-visit procedures such as dental pulp disease (Puangla & Chompu-inwai, 2024).

Table 3. Table of Indirect Costs (in rupiah)

No	Indirect Costs	Amount
1	**Depreciation Costs**	
	Building	55.314.085
	Non-Medical Equipment	19.082.269
2	**Operational Costs**	
	Non-Medical BHP	1.786.350
	General Expenses	16.654.656
	Total BTL	**78.864.396**

Table 4. Production units, service products, and *unit* costs in the case of dental pulp disease

UNIT ACTIVITY	SERVICE PRODUCT	*UNIT COST* (Rp)(BL+BTL)	Amount (Rp)
	Permanent Filling		387.027
	Visit I	387.027	
	Pulpal Cap		498.936
	Visit I	210.184	
	Visit II	288.752	
DENTAL CLINIC	**Root Canal Treatment**		1.692.181
	Visit I	282.919	
	Visit II	420.731	
	Visit III	262.565	
	Visit IV	324.919	
	Visit V	401.047	
	Tooth Extraction		556.544
	Visit I	388.811	
	Visit II	167.733	

From Table 4, it can be observed that multi-stage procedures, particularly root canal treatment, result in higher unit costs due to repeated use of materials, labor time, and facility utilization.

These findings are consistent with research by Rahmasari et al. (2022), which reported that the number of visits and duration of procedures are the main cost drivers in dental services, with endodontic procedures tending to have higher costs compared to simple treatments. A study by Puangla & Chompu-inwai (2024) using the Time-Driven Activity-Based Costing approach also confirmed that variations in time and intensity of resource utilization significantly affect unit costs. Therefore, recommended efficiency strategies include reducing non-productive time, optimizing the use of disposable materials, and managing facilities appropriately to reduce costs without compromising service quality (Puangla & Chompu-inwai, 2024).

To reduce the gap between production costs and JKN financing, steps were taken to develop Clinical Pathways (CP) and Clinical Practice Guidelines (PPK), making services more efficient by reducing length of stay and actual operational costs (Fitria et al., 2021). Procedures within a treatment are also influenced by adherence to the Clinical Pathway. In calculating unit costs using the ABC method, the existence and adherence to CP significantly affect the accuracy of real costs (Suryawati & Nandini, 2024).

Thus, Clinical Pathways (CP) not only function as clinical guidelines for healthcare professionals but also serve as a reference for calculating more realistic and measurable cost requirements. In the context of hospital management, CP helps organize cost standards and services into a unified care package, thereby minimizing clinical practice variation, improving resource utilization efficiency, and providing tariff certainty for both service providers and patients. Additionally, CP implementation supports transparency, accountability, and quality control of services in the era of National Health Insurance (JKN) (Tanjung & Akbar Santana, 2022).

After calculating unit costs using the ABC method, a comparative analysis of the Cost Recovery Rate (CRR) was conducted with JKN claims under the INA-CBGs package and current real cost tariffs calculated using the modified Double Distribution method in 2021. For general tariff increases, adjustments were made based on annual inflation rates sourced from Bank Indonesia data.

Based on official data from Bank Indonesia (BI), Indonesia's inflation rate showed a relatively controlled trend over the past three years. In 2023, inflation was recorded at 2.61% (year-on-year), still within Bank Indonesia's target range of 2–4%. In 2024, inflation declined to 1.57% (yoy), one of the lowest inflation rates in the last decade. Meanwhile, as of September 2025, year-on-year inflation reached 2.65%, indicating a slight increase in price pressure compared to the previous year.

Overall, this trend illustrates that national inflation has been maintained at a stable and controlled level. The decline in inflation in 2024 demonstrates successful coordination between Bank Indonesia's monetary policy and government fiscal policy. However, the increase in 2025 indicates new pressures from external and domestic factors that need to be anticipated.

This inflation increase has impacted service tariff adjustments, which also show an upward trend, from IDR 163,000 in 2022 to IDR 167,254 in 2023, IDR 169,880 in 2024, and projected to reach approximately IDR 174,381 in 2025. This reflects tariff adjustments in line with changes in annual inflation rates.

Table 5. Comparison of CRR using the ABC method, CRR for JKN claims, and CRR *using* the DD method

Service Product	UC Metode ABC	JKN Claim CRR (291,600)	CRR UC Method DD (174.381)
Permanent Filling			
Visit I	351.369	(75%)	(45%)
Pulp Caping			
Visit I	265.919	(139%)	(84%)
Visit II	337.418	(101%)	(61%)
Root Canal Treatment			
Visit I	263.459	(103%)	(62%)
Visit II	392.481	(69%)	(42%)
Visit III	246.678	(111%)	(67%)
Visit IV	382.643	(89%)	(54%)
Visit V	353.237	(73%)	(44%)
Tooth Extraction			
Visit I	321.055	(75%)	(45%)
Visit II	112.453	(174%)	(105%)

Overall, the DD method resulted in a lower CRR compared to the JKN claim tariff because proportional overhead distribution did not reflect actual resource consumption. Conversely, the ABC method was more accurate in identifying cost drivers such as clinical time, consumables, and visit frequency. The findings of this study were consistent with those of Zang et al. (2023) and Rahmasari et al. (2022), who confirmed that complex procedures such as root canal treatment required higher costs than those reflected in JKN claim tariffs. Therefore, tariff evaluation based on more appropriate costing methods became important to maintain the financial sustainability of hospitals and the quality of dental services in the JKN era (Zang et al., 2023; Rahmasari et al., 2022).

One strategy to address the low CRR of INA-CBGs packages was through cost containment. Cost containment represented a systematic effort to control or reduce hospital operational costs while maintaining efficiency without compromising service quality. In the context of prospective payment systems such as INA-CBG's in Indonesia, cost containment became critically important because package tariffs (prospective payment) were fixed and could not be adjusted to real costs, requiring hospitals to find ways to ensure service costs could approach or not far exceed INA-CBG's tariffs (Wahidah & Yusuf, 2022).

Several cost containment strategies that could be implemented included: (1) Conducting cost analysis using the Activity Based Costing (ABC) method to obtain more accurate cost information (Kusuma et al., 2024); (2) Standardizing Clinical Pathways to improve service efficiency (Indrati Dwi Kurniawati & Sugeng, 2024); (3) Using formularies and rational drug use policies, as demonstrated in research in Bandung on "Cost of Illness and Cost Containment of empirical antibiotic use" which compared antibiotic combinations with different costs but comparable results, and calculated potential savings (Sinuraya et al., 2012); (4) Reducing waste in logistics through lean management, energy and asset efficiency, and better medical record system management (Munaa et al., 2021); (5) Improving energy and asset efficiency

(Igusti et al., 2025); and (6) Monitoring and evaluating claims and the coding process in the medical record system (MRS), including tariff adjustments. Hospitals could use unit cost data to propose INA-CBG's tariff revisions to better reflect actual costs, or set independent/non-JKN service tariffs for cross-subsidization that helped cover costs not covered by JKN patients (Wahidah & Yusuf, 2022).

After unit cost was calculated using the Activity-Based Costing (ABC) method, the next stage was service tariff determination. Unit cost became an important basis for determining tariff amounts because it reflected the actual resource consumption of each type of service. In practice at regional general hospitals (XY), tariff determination not only considered the results of unit cost analysis, but also regulatory aspects, community purchasing power, National Health Insurance (JKN) tariff structure, and regional policies. This process aimed to ensure that established tariffs could cover operational costs, remained affordable for patients, and were aligned with the principles of efficiency and service sustainability (Mursalin, 2019).

Based on the data analysis and discussion conducted in this study, several conclusions could be drawn as follows:

1. The analysis results showed that unit costs of procedures for dental pulp disease varied depending on the type and complexity of treatment. Using the Activity-Based Costing (ABC) method, it was found that the procedure with the highest cost was root canal treatment at the second visit at Rp420,731, followed by tooth extraction at the first visit at Rp388,811, and permanent filling at Rp387,027. Meanwhile, the procedure with the lowest cost was pulp capping at the first visit at Rp210,184.

2. The unit cost of procedures for dental pulp disease calculated using the Double Distribution method adjusted for inflation assumptions resulted in an average of Rp176,030.

3. The comparison results showed that most unit costs (UC) calculated using the Activity-Based Costing (ABC) method were higher compared to JKN claim tariffs (Rp291,600) and CRR from the Double Distribution method (Rp176,030). The highest cost was found in root canal treatment visit II at Rp420,731, while the lowest was pulp capping visit I at Rp210,184. These results indicated that the ABC method provided a more detailed real cost estimation and reflected the actual resource requirements for each dental service procedure.

4. XY Kajen Hospital could implement the Activity-Based Costing (ABC) method sustainably in the Dental Clinic as a basis for tariff determination and evaluation, by optimizing human resources, time, and medical materials, strengthening cost recording and financial information systems, and enhancing the role of quality control teams and compliance with Clinical Pathways for service cost efficiency and accuracy.

CONCLUSION

Based on the results of data analysis and discussion conducted in this study, it was concluded that the unit cost of procedures for dental pulp disease varied depending on the type and complexity of treatment, with the Activity-Based Costing (ABC) method showing the highest cost for root canal treatment at the second visit at Rp420,731 and the lowest for pulp capping at the first visit at Rp210,184. Comparison

of calculation results showed that most unit costs using the ABC method were higher compared to JKN claims (Rp291,600) and the Double Distribution method with an average of Rp176,030, indicating that the ABC method provided a more detailed real cost estimation that reflected the actual resource needs for each dental service procedure. XY Kajen Hospital was recommended to implement the ABC method continuously in the Dental Polyclinic as a basis for tariff determination and evaluation, by optimizing human resources, time, and medical materials, strengthening cost recording and financial information systems, as well as enhancing the role of quality control teams and adherence to Clinical Pathways for efficiency and accuracy of service costs.

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