



UNIT COST ANALYSIS OF CENTRAL STERILE SUPPLY DEPARTMENT (CSSD) SERVICES USING THE ACTIVITY-BASED COSTING METHOD

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ABSTRACT

The Central Sterile Supply Department (CSSD) is a vital hospital support unit that ensures the availability of sterile medical instruments to support clinical services and prevent nosocomial infections. However, many hospitals in Indonesia, including Dr. Abdul Aziz General Hospital, Singkawang, have not established cost-based tariffs for CSSD services. This study aimed to calculate the unit cost of CSSD services at Dr. Abdul Aziz General Hospital, Singkawang, using the Activity-Based Costing (ABC) method. A descriptive qualitative study was conducted. Data were collected through observation, interviews with CSSD staff and management, and document review of financial and operational reports for the CSSD in 2024, specifically focusing on cost components, resource consumption, and activity volumes. Data Analysis used the Activity-Based Costing (ABC) method to meticulously trace overhead costs to services. This analysis followed six systematic steps: (1) identifying all cost components, (2) defining main CSSD activities, (3) determining appropriate cost drivers for each activity, (4) allocating total costs to each activity center, (5) calculating the unit cost per activity, and finally (6) determining the total cost for each instrument set sterilized. The total CSSD operational cost in 2024 was IDR 2,335,001,386, with a unit cost per sterilization cycle of IDR 2,470,901. Costs per instrument set were: major surgery set IDR 1,235,450; medium surgery set IDR 412,640; minor surgery set IDR 247,090; and single instrument IDR 123,545. Activity costs were dominated by sterilization (30%) and packing (25%). The ABC method produces more accurate cost calculations compared to traditional methods and can be used as a basis for tariff setting, cost control, and hospital financial planning. Future studies are recommended to expand the analysis to other hospital support units to benchmark efficiency and strengthen tariff policies.

Keywords: activity-based costing; CSSD; hospital cost; tariff; unit cost

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INTRODUCTION

Hospitals are required to provide efficient and cost-transparent healthcare services. The CSSD is one of the supporting units ensuring the availability of sterile instruments to maintain patient safety, prevent nosocomial infections, and support infection control. However, many hospitals in Indonesia, including Dr. Abdul Aziz General Hospital Singkawang, do not yet have standardized CSSD service tariffs. This highlights the need for accurate cost analysis. Without proper cost analysis, hospitals face difficulties in tariff formulation, cost control, and financial sustainability.

This study applies the ABC method to calculate accurate unit costs as the basis for tariff-setting and budgeting. The ABC method provides more realistic calculations by linking resource consumption to activities. Previous studies (Syifa, 2021; Islami, 2021; Yuliani, 2018; Rahmawati, 2017) showed cost variations, indicating that the ABC method produces more reliable cost data compared to traditional methods. This is in line with Baker (1998), who emphasized the role of ABC in improving cost allocation accuracy in healthcare services, and Nowicki (2008), who highlighted the importance of financial management transparency in hospitals, thereby supporting efficiency, transparency, and accountability. This study aimed to calculate the unit cost of CSSD services at Dr. Abdul Aziz General Hospital, Singkawang, using the Activity-Based Costing (ABC) method

METHOD

This research used a qualitative descriptive design at the CSSD of Dr. Abdul Aziz General Hospital Singkawang in 2024. Primary data were obtained through observation and interviews with CSSD staff, while secondary data were collected from financial reports, asset depreciation records, and CSSD operational data.

ABC analysis followed six stages, adapted from Javid et al. (2016), who applied ABC in hospitals to calculate unit costs more accurately:

1. Identify cost components
2. Identify main activities
3. Determine cost drivers
4. Allocate costs to activities
5. Calculate unit cost per activity
6. Determine cost per type of instrument set

The activities analyzed included preparation, washing, drying, inspection, packaging, sterilization with a Getinge 533HC autoclave, and distribution. Cost drivers included the number of cycles, type of instrument sets, and usage duration.

RESULT

The total CSSD operational cost in 2024 was IDR 2,335,001,386, with a per-cycle sterilization cost of IDR 2,470,901.

Table 1.
Unit Cost per Type of Instrument Set

Instrument Set Type	Unit Cost (IDR)
Major Surgical Set	1,235,450
Medium Surgical Set	412,640
Minor Surgical Set	247,090
Single Instrument	123,545

ABC analysis showed cost variations depending on set complexity and cycle volume

Table 2.
CSSD Cost Breakdown by Activity (2024)

Activity	Annual Cost (IDR)	Cost per Cycle (IDR)	Percentage (%)
Receiving dirty instruments	116,750,069	123,545	5%
Decontamination	583,750,347	617,725	25%
Drying	233,500,139	247,090	10%
Setting & Packing	583,750,347	617,725	25%
Sterilization Process	700,500,416	741,270	30%
Storage & Distribution	116,750,069	123,545	5%
Total	2,335,001,386	2,470,901	100%

DISCUSSION

The results confirm the superiority of the ABC method in more accurately allocating costs to CSSD activities. Consistent with Javid et al. (2016), ABC provides a better picture of cost variations among hospital services compared to traditional methods. The method revealed cost differences among types of instrument sets. Compared with previous studies Syifa (2021: IDR 2,049,388), Islami (2021: total cost IDR 3.4 billion; per machine IDR 860,827 – 6,283,597), Yuliani (2018: IDR 72,500 per set), and Rahmawati (2017: IDR 65,340 per set) Dr. Abdul Aziz Hospital showed higher per-cycle costs. This may be influenced by lower utilization and overhead allocation. Recent research (Riofandi, 2022) emphasized the importance of ABC application. This unit cost information can be used as a basis for tariff setting, cost-efficiency programs, and budgeting policies at Dr. Abdul Aziz General Hospital Singkawang. Moreover, cost transparency supports accountability in hospital management.

CONCLUSION

The unit cost of CSSD services at Dr. Abdul Aziz General Hospital Singkawang is IDR 2,470,901 per cycle, with variations by instrument set type. The ABC method has proven to provide accurate information for tariff-setting and hospital budget planning.

Hospital management is advised to implement the ABC method not only in CSSD but also in other supporting units. Future studies are recommended to extend the analysis to other hospital support units to compare efficiency levels and strengthen tariff-setting policies.

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