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REDESIGNING CLINICAL PATHWAY OF ELECTIVE CAESAREAN SECTION USING ACTIVITY-BASED-COSTING REDUCE EXPOSURE TO COVID-19

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Abstract

This research objective is to discover non-value-added activities in the elective cesarean section (CS) clinical pathway (CP) through cost analysis using the ABC method and redesign elective CS CP at W Hospital. Activity-Based-Costing (ABC) is an accounting system designed through activity management. The ABC system identifies all functions in the service process chain, calculates the activity costs, and assigns costs to cost objects, such as activity-based service products. This calculation method emphasizes the service process. The ABC method is seen as a unit cost calculation system that is suitable for hospitals. CP costing using the ABC method is a cost analysis using CP as the basis for service activities. The CP of Elective CS consists of various activities. This study used a case study approach. The eight informants were the head of finance, the head of medical services and support, one ob-gyn specialists, one anesthetist specialists, one outpatient installation nurse, one midwife, one inpatient installation midwives, and one nutritionist. The COVID-19 changed the procedures and influenced the activities of CS CP. The analyses were conducted using the ABC method and data triangulation. Non-value-added activities found were clinical assessment in the emergency room (ER), laboratory activities, and organic waste treatment. Non-value-added found in clinical assessment in the ER, laboratory examinations, and organic waste treatment. CP CS redesign consists of activities of admission, pre-operation, and post-operation, surgery, pharmacy, nutrition, medical records, laundry, billing, logistics, and management administration. The researchers suggest that W hospital should redesign elective CS CP activities to eliminate non-value-added activities.

***Keywords:** ABC, non-value-added activities, COVID-19.*

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INTRODUCTION

Activity-Based Costing (ABC) is an accounting system designed using activity management. The rationale for the ABC method is that activities are consuming resources, and products are consuming activities (Yong, 2017; Zelman et al., 2014). ABC improves the cost calculation system by identifying activities as cost objects. The activities include events, tasks, or work processes, such as planning the service products, preparing the equipment, operating the machinery, and distributing the service products. The ABC system identifies all functions in the service process chain, calculates the activity costs, and assigns costs to cost objects, such as activity-based service products (Eggers & Bangert, 1998; Horngren et al., 2012; Riwayadi, 2016; Yong, 2017). The ABC method is a calculation method that concentrates on the service process. The cost calculation of an activity-based service product includes all costs that arise along the service chain. The calculation of this method is more complicated than the traditional method because the allocation of indirect costs uses various cost drivers. A cost driver is based on the unit or volume of service in the conventional indirect cost allocation method. However, the cost information on the ABC method is more detailed, but the complexity of this method can be overcome by using information systems (Horngren et al., 2012; Riwayadi, 2016).

Hospital is a business delivering various service products that consume multiple activities and resources. The ABC method is seen as a unit cost calculation system that is accurate, suitable, and profitable for hospitals (Bates, 2014; Yereli, 2009). This unit cost calculation is an activity-based cost accounting system designed to encourage human resources (HR) to carry out long-term cost efficiency through activity management (Hidhayanto, 2009; Riwayadi, 2016; Zelman et al., 2014). According to the activities carried out, the ABC method charges indirect costs based on the production process or service activity proportionally (Haroun, 2015; Riwayadi, 2016).

In the ABC method, activities are task units that encompass specific goals (Yong, 2017). Activities provide cost information to decision-makers at the hospital. This information is used as the basis for activity management. Activities in clinical pathways are cost objects used as the basis for calculating unit costs (Hidhayanto, 2009). The calculation of unit costs based on CP activities (CP costing) is an effort to control quality (Widjayanto et al., 2017). CP costing calculates the cost of each activity and resource. The results of activity cost analysis using the ABC method can be used to redesign CP. ABC is a cost analysis method that supports cost control efforts (Cannavacciuolo et al., 2015; González et al., 2005) (Widjayanto et al., 2017). The ABC method increases resource management, promotes improved performance, identifies non-value added, motivates cost reduction, optimizes the use of resources, and improves organizational efficiency (Aurelia & Pujiyanti, 2017; Mehtap Aldogan et al., 2014; Surendra P. Agrawal et al., 1998)

Non-value-added activities do not provide value to the customer or can be said as an activity that the customer does not require. An example is that reporting to comply with government regulations does not provide added value from the customer's perspective. Therefore, non-value-added activities should be sought to be eliminated or combined with other activities or simplified, thus reducing production costs (Shafer & Collins, 1991).

CP is arranged as a reference in detailed steps for particular clinical situations. CP is the standard of everyday practice. All parties who deliver services to patients use one CP format when providing services. The parties involved in the service are caregiving professionals (Panduan Praktik Klinis Dan Clinical Pathway Dalam Asuhan Terintegrasi Sesuai Standar Akreditasi Rumah Sakit 2012, 2015). CP regulates services from when the patient is admitted to the hospital until hospital discharge (Astuti et al., 2017). CP is a tool to make decisions together for the PPA. CP is made to improve service quality, improve patient safety, increasing patient satisfaction, and optimizing resources (Surendra P. Agrawal et al., 1998)

Cesarean section (CS) originates from the Latin word *caedere,* which means to cut. In obstetrics, the term refers to a surgical procedure aiming to give birth to a baby by opening the mother's stomach wall and uterus (Mulyawati et al., 2011). (10). CS is a medical procedure to help deliveries that are not achieved through normal delivery (Cunningham et al., 2018). CS CP is the standard of patient care procedures CS., involving doctors, midwives, nurses, dietitians, medical rehabilitation, etc. (Panduan Praktik Klinis Dan Clinical Pathway Dalam Asuhan Terintegrasi Sesuai Standar Akreditasi Rumah Sakit 2012, 2015).

Unit cost calculation based on CP costing using the ABC method is a cost analysis using CP as the basis for service process activities (Hidhayanto, 2009). Unit cost calculation based on CP using the ABC method utilizes CP activity as the action center. The hospital must develop a CP outlined in an operational procedure to obtain a clear flow of patient management. Information on activity recorded in the CP is documented, measured, and used as basic data. The calculation of unit cost based on CP impacts reducing costs through activity management by eliminating non-value added activities (Astuti et al., 2017).

A particular service process, including the elective CS CP, consists of various activities. Activity analysis can find value-added activity and non-value-added activity. Value-added activities are activities that provide benefits to customers and the organization. Non-value-added activities do not benefit customers or the organization, so these activities shall not be done (Meiny Parengkuan, 2013). (21). The ABC method helps health care facilities find value-added and non-value-added activity. Non-value added should be reduced or eliminated to reduce the unit cost. Health care facility administrators can evaluate the cost of the service process using the ABC method to carry out quality control and cost control (Okutmus & Ergul, 2013). With the COVID-19 pandemic, the procedure for handling patients has changed, including for patients who have to undergo a cesarean section. These changes lead to changes in value-added or non-value-added activities, which affect patient costs. This research aims to find non-value-added activities in elective CS CP by calculating the unit cost using the ABC method in W hospital and to redesign the elective CS CP that is exposed to COVID-19.

RESEARCH METHOD

This research is qualitative research with a case study approach. The case studies are used to acquire in-depth knowledge or deep understanding of the program, process, or event being studied. Usually, the selected event, hereinafter referred cases, are things that are actual, ongoing, not

something that has passed (Palinkas et al., 2016; Rahardjo, 2017). Case studies focus on applying theory to extend the benefits of theory, not building or developing a theory (Mehtap Aldogan et al., 2014). A case study in this research is a scientific activity carried out intensively, in detail, in-depth, and thoroughly calculating the unit cost of elective CS based on CP using the ABC method. Case studies beneficially provide in-depth knowledge or understanding of the activities of CS CP in the calculation of elective CS unit costs using the ABC method whose primary purpose is expanding the benefits of the theory.

The study was conducted from May 2020 to June 2020 at W hospital, when a COVID-19 pandemic is still happening in Indonesia. The researchers examined the elective CS service activities whose implementation was carried out based on the implementation of CP. Those activities were the basis of activity analysis in calculating elective CS action unit cost using the ABC method. The subjects who answered the research questions regarding CP activities and CS costs in this research were Mr. Budi, the head of finance, dr. Kusumawati head of medical services and support, dr. Husada ob-gyn specialists, dr. Wijayanto anesthetist specialists, Anggraini outpatient installation nurse, Kristie ER midwives, Dewi inpatient installation midwives, and Fidianti nutritionists. The object of this research was the elective CS activity based on CP. Activities were implementing CP in the form of activities that occurred directly on CS services and indirect activities that support CS activities.

Interviews with research subjects were conducted to complete information and clarify data obtained through document study. The researchers conducted a study by conducting a document study on elective CS CP includes 2019 medical record documents, 2017-2019 financial reports, 2017-2019 annual reports, and 2017-2019 reports of activity results from the emergency room emergency (ER), operating room installation, obstetrics and gynecology inpatient installation, nutrition installation, laundry, logistics, facility maintenance, security and environment officer, human resources and education and training, and hospital management information system. The head of finance, head of medical services and support, and ob-gyn specialists were conducted after research findings were obtained. Discussions with the head of medical services and support and ob-gyn specialists were undertaken to analyze activities resulting from CP implementation. Meetings were also conducted with the head of finance to measure the accuracy and adequacy of the data. The research instrument was the researcher, and the researcher ended the data collection when the data collected were valid. Descriptive data analysis and data triangulation were done. A descriptive analysis was conducted using the ABC method.

RESULTS AND DISCUSSION

Result

This study examined the implementation of elective CS activities based on CP, which were the objects of unit cost calculation using the ABC method. At W hospital, patients who undergo elective CS first receive antenatal care (ANC) service at the outpatient installation. Informant 1 explained that at ANC, the patient underwent a pre-operative examination in the form of a physical

exam and supporting analyses, undergoing the screening process and prepare the patient's condition. The DRM observation results of elective CS patients showed laboratory examinations when ANC patients consisted of complete blood (DL), clotting time (CT), bleeding time (BT), and random blood sugar (GDA).

Informant 1 explained the outpatient installation nurse after getting information on the patient's surgery schedule, contacting the operation team, completing medical record documents (MRD), and ordering patient rooms. Nurses motivate patients to fast before hospital admission, shaving pubic hair, and came to the emergency room at 04.00 AM as scheduled operation. The outpatient installation nurse handed over the completed MRD to the ER officer.

The interviews with Informant 1, who served as outpatient installation nurses coordinator, explained elective CS patients' preparation at the outpatient installation.

> *"... the patient had the laboratory and vital sign assessment, contact the anesthetist, anesthetist assistant, surgical assistant, and operating room. Medical record documents (general consent, informed consent) were completed and then ordered the room. Patients are motivated to fast, shave, and come at 4 AM to the ER on the date determined. When the preparations are ready and complete, the status will be taken to the ER, so the status is ready when the patient arrives ..." (Informant 1/300520)*

The implementation of elective CS activity begins with the patient admission process at the ER patient registration officers. Informant 2, an IGD patient registration officer who has been on duty for two years, explained the admission process for elective CS patients.

> *"... usually, CS px is from the polyclinic, usually arrives at 4 or 4.30 AM. What patient registration officers did was inputting the visits, then made the participant eligibility letter, stickers, and bracelets. Because the polyclinic nurse has ordered the general consent and the room, so the patient registration officers only reconfirmed to the ward ..."(Informant 2/300520)*

Patient registration officers then directed the patient to the ER triage room. This research was conducted when the COVID-19 pandemic was still happening. W hospital provided services and isolation rooms for COVID-19 patients in the ER; however, the flow of admission for COVID-19 and non-COVID-19 patients in the emergency room had not been separated. Therefore, after going through the screening process in the emergency room triage, COVID-19 patients were treated in the emergency room isolation room. The patient was examined by a nurse or a midwife and an ER doctor on duty in the triage room. Informant 3, a midwife who has worked in the IGD for two years, conveyed the patient assessment process in the ER.

> *"... The patient comes, then she registers. After that, the triage nurse does the anamnesis and checks the vital signs. Then, the on-duty doctor examines the patient, and the nurse completes the inpatient medical record. Usually, if an elective CS patient has therapy from the doctor in charge of services and the anesthetist, the doctor on duty at the ER only writes a prescription. The infusion is done in the room. When the file is ready, the patient is moved to room ..." (Informant 3/180520)*

Service activities for patients who will undergo elective CS in the ER are history taking, vital signs examination by nurses or midwives, analysis, and prescriptions writing by the emergency room doctor based on the advice from ob-gyn specialists and anesthetists. The MRD file handed over by the outpatient installation nurse was checked for completeness and filled in by the nurse or midwife and the doctor on duty at the ER. When the MRD file is complete, and the patient room is ready, the patient is transferred to the emergency nurse or midwife's obstetrics and gynecology inpatient installation.

The results of the study on the elective CS MRD clarified with detailed data on patient care. The costs show that 94% of patients had undergone complete blood count (CBC), clotting time (CT), bleeding time (BT), and random blood sugar (RBS) examinations when the patient receive antenatal care. In addition, laboratory tests that had not been performed at the ANC time were carried out when the patient underwent a clinical assessment in the ER.

Informant 4, the obstetrics and gynecology inpatient installation coordinator, expressed the process of elective CS patients in obstetrics and gynecology inpatient installation.

> *"... the patient came at 5 AM and registered at the patient registration. CBC, BT, and CT were done at the polyclinic during the last control for laboratory checks. The ER nurse examined the patient for vital signs ... if there are no lab results, the patient will be checked in the ER lab ... the patient was taken to the room. The patient was checked for vital signs, fetal heart rate, and contraction (VT is done if there are signs of normal labor), the IV is installed in the room. Shaving was done. One hour before the operation, premedication from the anesthetist is given. Half an hour before surgery, the patient is escorted to the operating room. The operating clothes are worn in the room. prophylactic antibiotics are given in OR (usually, the antibiotic is cefotaxime) ..." (Informant 4/190520)*

Laboratory activities are carried out by medical laboratory technologists (MLT). MLT heads to the ER after they receive a request for laboratory examination from the ER officers. In the ER, MLT takes blood samples from patients for CBC, CT, BT, and RBS analysis in the laboratory. Machines carry out the CBC and RBS tests, but CT and BT are done manually. The results of laboratory examinations are expertise by a clinical pathologist. Laboratory results are sent by laboratory personnel to the obstetrics and gynecology inpatient installation.

The implementation of elective CS activity in obstetrics and gynecology inpatient installation includes vital signs, fetal heart rate (FHR), and contraction (his) examinations. In addition, midwives perform vaginal toucher (VT) tests on patients who indicate signs of normal labor. Subsequently, the midwife performs infusion installation, shaves the patient's pubic hair, asks the patient to wear surgical clothes, and gives premedication injection one hour before surgery. The patients are then sent to the operating room installation half an hour before the operation.

Informant 5, a nurse who has served for three years in the operating room, provided elective CS operation services at operating room installation.

"... for elective CS treatment, the patient is admitted to the operating room, we do the exchange with the nurse or midwife, identify the patient, and then give them prophylactic antibiotics. When the team is complete, we bring the patient into the operating room, moving the patient to the operating table. We perform sign-in with the anesthetist and anesthetist assistant. Then, anesthesia is performed. For elective CS patients, regional anesthesia is used. After the patient is sedated, we install the dower catheter. Then, after the operation area is washed using chlorhexidine, we perform draping (arde installation, disinfection with betadine on the surgical wound, covering the area around the operating area with sterile linen). After the operation team is ready, we spend time with the doctor (operator), anesthetist, and the other team. Then the surgical procedure is carried out. Within 30-40 minutes, before the operator doctor closes the operation area (when suturing the fascia), a sign-out is performed. After the surgery closure, transfer preparation for the patient to the gurney is done for observation in the recovery room. In the recovery room, observations are made for 15-30 minutes. Then, the patient is ready for transfer by the room nurse or midwife ... the linens worn by the operating room team are nine tops, ten trousers, one shirt, one patient gown, one patient sarong ... time needed for operating room installation surgery is one hour before and one hour after ..." (Informant 5/200520)

Operating room nurses receive patients in the transfer room of operating room installation. The operating room installation team consists of an ob-gyn specialist (operator), anesthetists, operator assistant, anesthetist assistant, instrument nurse, two circulating nurses, obstetrics and gynecology inpatient installation midwives, and pediatricians. The operating room installation team wears sterilized surgical suits. Activities at operating room installation are nurses put on surgical caps, identify patients, and give antibiotics injections.

Anesthetists perform the regional anesthesia at the operating room installation. The nurses install the dower catheter, clean the operating area, do the draping, and cover the area around the operating area using sterile linen. Ob-gyn specialists operate for approximately 60 minutes. The nurses observe the patient after surgery. Then, the patient is transferred by the midwife back to the obstetrics and gynecology inpatient installation.

After the operation, the patient undergoes hospitalization in obstetrics and gynecology inpatient installation. Informant 4 conveyed elective postoperative CS patient care.

"... when taking a patient from OK, vital signs observation is carried out. Diet is given 6 hours after the completion of the operation. After 6 hours post-operation, the patient is taught to sleep sideways to the right and left and breast care. On the second day, the infusion is plugged (the last injection is in the morning), the catheter is then turned off, the patient is allowed to mobilize gradually to sit and move. At noon, the patient starts to per'os. On the third day, the surgical wound is treated (gauze is replaced with Opsite). Finally, in the afternoon the patient may return home (hospital discharge) ..." (Informant 4/190520)

"... the first day the patient undergoes the operation. After post-operation for 6 hours, the patient may eat. The diet is typhoid diet II HCHP syrup. The afternoon diet is HCHP soft rice. The second day until hospital discharge is HCHP rice ..." (informant 4/190520).

Midwives of the inpatient installation obstetrics and gynecology hand over the patient, who has completed elective CS, to the nurses at operating room installation. Midwives conduct vital signs and educate the patient. The patient is given a typhoid diet II HCHP syrup (high-calorie, high-protein) six hours after surgery. The following diet is HCHP rice. For the second day until returning home, the patient is given HCHP rice diet. On the second day, the midwife releases the transfusion set on the patient. The midwife provides bladder training to the patient and then removes the urinary catheter. On the third day, the ob-gyn specialists treat the patient's surgical wound, and the patient is allowed to leave the hospital.

The results of the identification of elective CS activities based on CP found 13 activities. The activity begins with admission services by ER patient registration officers, followed by clinical assessments in the ER by the emergency doctor on duty and a nurse or midwife. Afterward, the patient underwent laboratory examinations for CBC, CT, BT, and RBS. Next, the ER nurse transferred the patient to obstetrics and gynecology inpatient installation to undergo preparation for surgery. Half an hour before surgery, the patient was transferred to the operating room installation to undergo cesarean section surgery. After the operation, the patient was then transferred to obstetrics and gynecology inpatient installation for postoperative care.

Elective CS service is supported by pharmaceutical activities that provide services on drug and medical equipment. Nutritional activities carry out the provision of nutritional care and diet. The laundry activities manage the linen. The development of the patient's condition and all clinical actions are documented in a medical record document (MRD), which is driven by recording and processing medical records. Logistical activities carry out the procurement of non-medical inventory items and consumables. Maintenance of facilities, infrastructure, equipment, environment, and hospital security is carried out by maintenance, security, and environmental activities. Administrative and management activities manage the human resource management, licensing administration, public relations and marketing, hospital SIM and hospital management.

This unit cost calculation is without the component of services of doctors and part-time nurses of the Operating Room Installation. The highest unit cost is found in the operational activity. Researchers found that elective CS unit cost calculation using the ABC method is based on implementing all activities in the CP that have been set in the RS W by the ABC method Rp. 5,545,931, - can be seen in Table 1, Table 2 and Table 3.

The results of the MRD assessment, details of treatment costs, and interviews found laboratory activities were not implemented in 94% of the patients. Laboratory activities are one of the CP CS activities, which must be carried out on patients undergoing CS elective surgery. Laboratory activities that are not implemented on patients will reduce the unit cost of elective CS by Rp. 126,854, -

Table 1. Activity Price Indirect Cost Elective Caesarean Section Based on Clinical Pathway using Activity Based CostingMethod

Activity		The allocation of hospital-level activity costs	The Normal Capacity		Activity Price
		DN = DK + DM	DO		DP = DN X DO
A6	Pharmacy	947.954.213	Number days of inpatient	17.542	54.039
A7	Nutrition	1.872.787.850	Number of diets	39.228	47.741
A10	Administrative treatment costs	1.338.138.430	Number days of inpatients	17.542	76.282
A3	Laboratorium	644.544.545	Number of laboratory examintations	31.526	20.445
A9	Medical records	431.905.965	Number of inptients	4.261	101.371
A8	*Laundry*	448.747.686	Number of linens	76.769	5.845
A1	Admission service	466.752.258	Number of inpatients from ER	8.392	55.617
A2	Clinical assessment	965.538.687	Number of inpatients from ER	3.207	301.104
A4	Pre dan post surgery	1.140.304.907	Number of inpatients in ob-gyn room	3.770	302.495
A5	Surgery	1.028.248.893	Number of surgery patients	748	1.375.277
		9.284.923.434			

Source: Documents and Interviews, processed

Tabel 2 Indirect Unit Cost Sectio Elective Caesarean SectionBased on Clinical Pathway using Method Activity Based Costing

Activity		Activity Rate	*Cost Driver* Stage II		*Indirect Unit Cost*
		DP = DN X DO	DQ		DR = DP X DQ
A6	Pharmacy	54.039	Number days of inpatient	3	162.117
A7	Nutrition	47.741	Number of diets	8	381.926
A10	Administrative treatment costs	76.368	Number days of inpatients	3	228.846
A3	Laboratorium	20.445	Number of laboratory examinations	4	81.779
A9	Medical records	101.371	Number of inptients	1	101.371
A8	*Laundry*	5.831	Number of linens	106	619.618
A1	Admission service	55.617	Number of inpatients from ER	1	55.617
A2	Clinical assessment	301.104	Number of inpatients from ER	1	301.104
A4	Pre dan post surgery	302.495	Number of inpatients in obsgyn room	3	907.485
A5	Surgery	1.375.277	Number of surgery patients	1	1.375.277
					4.215.139

Source: Documents and Interviews, processed

The researchers clarified the findings of CP implementation to ob-gyn specialists, heads of medical services and support, and outpatient coordinators. Laboratory examinations on 94% of the patients undergoing elective CS were performed when the patients underwent antenatal care (ANC) one to three days before the patient underwent surgery, as stated by informant 1. Informant

6, an ob-gyn specialist as a doctor in charge of service, said laboratory tests were carried out to prepare the patient's condition before surgery.

"... in the elective case, my friends gave the information, we did pre-operative checks, sometimes when there were bad results, they informed that they were aware of the clinical condition which was related to tariffs, the ob-gyn doctor would decide to continue the operation at this hospital, or the patient shall be referred ..." (Informant 6/030620)

"..... If the elective CS surgery was the laboratory examination three days before surgery..... ..... if the patient is planning for surgery tomorrow, that day will be laboratory examination ....." (Informant 1/170221)

Tabel 3. The Calculation Result of Elective CS unit cost based on CP using the ABC method at W hospital

	Activity	DC	IDC	UC CS Elective Based on CP
				DC + IC
A1	Admission service	1.485	55.617	57.102
A2	Clinical assessment	20.000	301.104	321.104
A3	Laboratory examinations	45.075	81.779	126.854
A4	Pre- and post-surgery	312.324	907.485	1.219.809
A5	Surgery	951.909	1.375.277	2.327.186
A6	Pharmacy	-	162.117	162.117
A7	Nutrition	-	381.926	381.926
A8	Medical records	-	101.371	101.371
A9	Administrative treatment costs	-	228.846	228.846
A10	Laundry	-	619.618	619.618
		1.330.792	**4.215.139**	**5.545.931**

Table captions: DC=*Direct Cost*, IDC=*Indirect Cost*
Source: Documents and Interviews, processed

Information about the incompatibility of anesthesia medications was obtained from informants 7, who said that they did not know about the CP at the hospital. Informant 9 explained that at the CP compilation, the anesthetic medications listed were those usually used in CS cases.

"... I don't even know there is a CP here, I haven't got the socialization ..." (Informant 7/040620)

"... administering the anesthetic drugs that have been used during the CS case. If it is different, we will communicate it to the anesthetist. It means another agreement ..." (Informant 9/250620)

Elective CS is a service product in hospitals that consume a variety of activities and resources. The main activities consist of clinical assessment, pre-and post-surgery, and surgery. The main activity is the activity that can produce the final product. For example, patient assessment activities resulted in the final product examination of emergency room patients; pre-and post-surgery activities resulted in obstetrics and gynecology inpatient installation services, and the

surgery activity resulted in the final product of surgical services. Intermediate service activities and hospital-level services support the main activities. Intermediate services are services that produce service products needed by the main activity. For example, intermediate service activities consist of admissions, laboratory, nutrition, laundry, medical records, and maintenance costs. Hospital-level activities are activities that support all major activities and intermediate activities. Hospital-level activities are logistics, maintenance, and management administration.

Discussion

The assessment results of elective CS activity based on CP found repetition of activities. It includes anamnesis, vital signs examination, and examination of the completeness of the patient's MRD file. The MRD file is studied on clinical assessment activities in the ER and pre-surgery at the obstetrics and gynecology inpatient installation. The unit cost found for clinical assessment activities in the emergency room was Rp. 321,104. Therefore, clinical assessment activity in the ER is a non-value-added activity because there is an activity similar to that in obstetrics and gynecology inpatient installation. The results of this study are different from the results of research by Ayuningtyas at Bhakti Rahayu Hospital Surabaya. She found non-value-added activities using the ABC method in handing over patients to operating room installation and re-administration at operating room installation in the services of operation patients (Ayuningtyas, 2016).

Based on an interview with ob-gyn specialists, an elective CS patient upon hospital admission after being accepted by admission officers does not have to go through an examination by emergency room on-duty doctor and nurse but can directly go to the obstetrics and gynecology inpatient installation by bringing a cover letter from the ob-gyn specialist. First, the patient will undergo anamnesis, physical examination by midwives and ob-gyn specialists. Then, file completeness checking at the obstetrics and gynecology inpatient installation.

One of the maintenance activity costs is waste management. W hospital collaborates with Dinas Cipta Karya on domestic waste management. Most of the domestic waste in W hospital comes from nutritional activities, as much as 31%, in wet waste from leftovers and dry waste from food packaging.

The unit cost calculation result for each activity requires further study and observation to find non-value-added activities. In addition, the results of interviews with informants from the nutrition installation that they had not carried out cost control was a condition needing follow-up to find non-value-added activities.

> *"..... not yet, I admit that the nutrition installation is still not running, because the spending costs that we spend every day have not yet been evaluated, so far in one year, there is a requirement. Details of the budget, over time, we don't understand whether it is economical or wasteful. So far, from the number of patients, we already have a reference to the maximum limit for goods we buy. Still, yes, there is no monitoring, so it passes. A year we spend how many billions, how much is the realization. .....(Informan 10/030620)*

Laboratory activities in the elective CS CP at W hospital were not performed in 94% of the patients because the examination had been carried out one to three days before the patient

underwent surgery when the patient underwent ANC. Elective CS is a type of measure that is planned and prepared. Laboratory examination during ANC is a preparation for the clinical condition of an elective surgery patient as an effort to minimize the surgery and anesthesia risk in the patient. Preparation of the patient's clinical condition by ensuring the patient's laboratory test results are within normal limits during ANC is an effort of the ob-gyn specialists at W hospital to carry out quality control and cost control.

Preparation of the clinical condition of elective surgery patients is needed to avoid risks due to surgery and anesthesia. Moreover, patients need to be screened for COVID-19 for infection prevention and control. Preparation of the patient's condition is an effort to prevent surgery postponement. The research results by Indriyanti and Suryawati at Dr. Kariadi Semarang stated that the leading cause of delay in surgery was patients' health condition. Operation delays impact increasing treatment days, reducing operating room capacity, and reducing the utilization of trained human resources in the operating room (Indriyadi & Suryawati, 2020).

Management of elective CS CP activities at W hospital can be done to reduce costs. Activity management can be executed is by eliminating and changing activities. Possible activities to eliminate are clinical assessment activities in the ER and laboratories.

The clinical assessment in the ER is an anamnesis and physical examination by a doctor and ER midwife. The clinical assessment was also carried out in obstetrics and gynecology inpatient installation. Clinical assessment, which is an action that must be done to ensure the patient's physical condition is within normal limits, is still carried out by midwives and ob-gyn specialists.

Laboratory tests that must be carried out to complete the pre-operative assessment of patients who will undergo elective CS surgery are carried out no later than three days before the operation. Reduction of clinical and laboratory assessment activities when patients are hospitalized before surgery does not reduce the pre-operative assessment activities of patients. Management of these activities does not reduce the quality of service but can reduce the unit cost of elective CS operations

During the COVID-19 pandemic, eliminating the clinical assessment of patients who will undergo elective CS surgery in the ER reduces the risk of COVID-19 infection exposure in patients. The patient entrance through the emergency room at W hospital is still not separated between COVID-19 and non-COVID-19 patients. COVID-19 transmission generally occurs through droplets during talking, coughing, or sneezing. Contact for at least 15 minutes within 6 feet or 1,829 meters among individuals with symptoms, such as coughing, are at high risk of infection. Transmission can also occur via aerosols, but it is unclear whether this is a significant infection source in humans outside the laboratory setting (Wiersinga et al., 2020).

The results of the identification of elective CS activities based on CP found 13 activities. It can be seen in Figure 1 Elective CS services based on CP, starting with admission service activities by admission staff officers (A1), followed by clinical assessments in the ER by nurses or midwives and doctors in charge of the ER (A2). The patients underwent laboratory tests CBC, CT, BT, and RBS (A3) in the next activity. Next, patients are transferred by the ER nurse to the obstetrics and gynecology inpatient installation to undergo surgery preparation (A4). Half an hour

before surgery, the patient transferred to the surgery room experienced CS surgery activities (A5). After surgery, the patient was again transferred to the obstetrics and gynecology inpatient installation for postoperative care (A4).

Elective CS services are supported by pharmacy activities that provide medical device drug services (A6). Nutrition and dietary care are provided by nutritional activities (A7). Linen is managed by the laundry activity (A10). The development of the condition and all clinical actions in the patient is documented on the medical record documents collected by recording and medical record processing activities (A8).

Procurement of non-medical inventory and non-medical consumables carried out by logistical activities. A11). Activities of maintaining facilities carry out maintenance of facilities, infrastructure, tools, environment and hospital security, security and the environment (A12) Human resource management, licensing administration, public relations and marketing, hospital information system, quality improvement and patient safety, and hospital management by administrative and management activities (A13). CP elective CS can be shown in Figure 1.

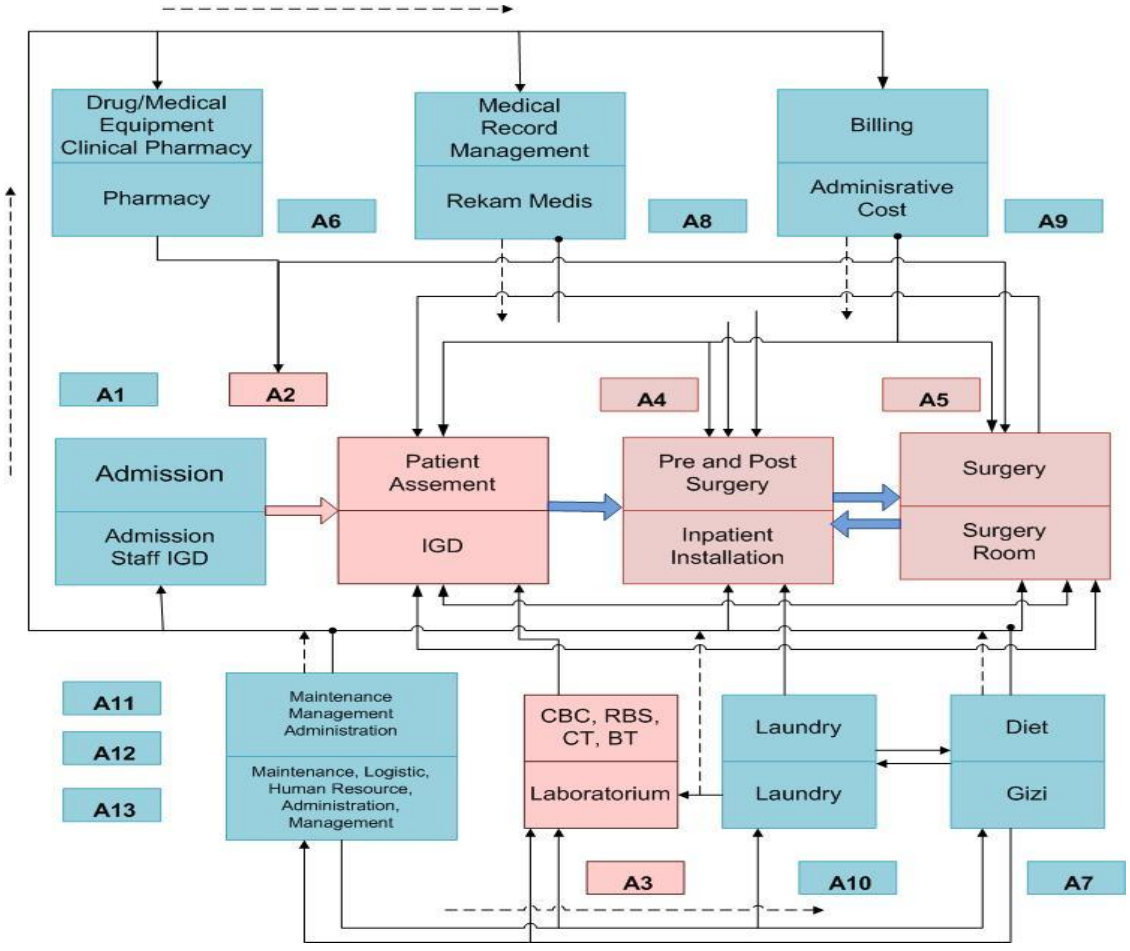

Figure 1. Elective Caesarean Section Activities Based on Clinical Pathway

The researchers recommend redesigning the elective CS activities based on CP that eliminate the clinical assessment activities (A2) and the laboratory activities (A3). The results of the elective CS CP redesign consisted of 11 activities. Activities started with admission service (A1), followed by patients entering obstetrics and gynecology inpatient installation IRNAs to undergo clinical assessment and surgery preparation (A4). Half an hour before surgery, the patient transferred to room surgery underwent surgery activities (A5).

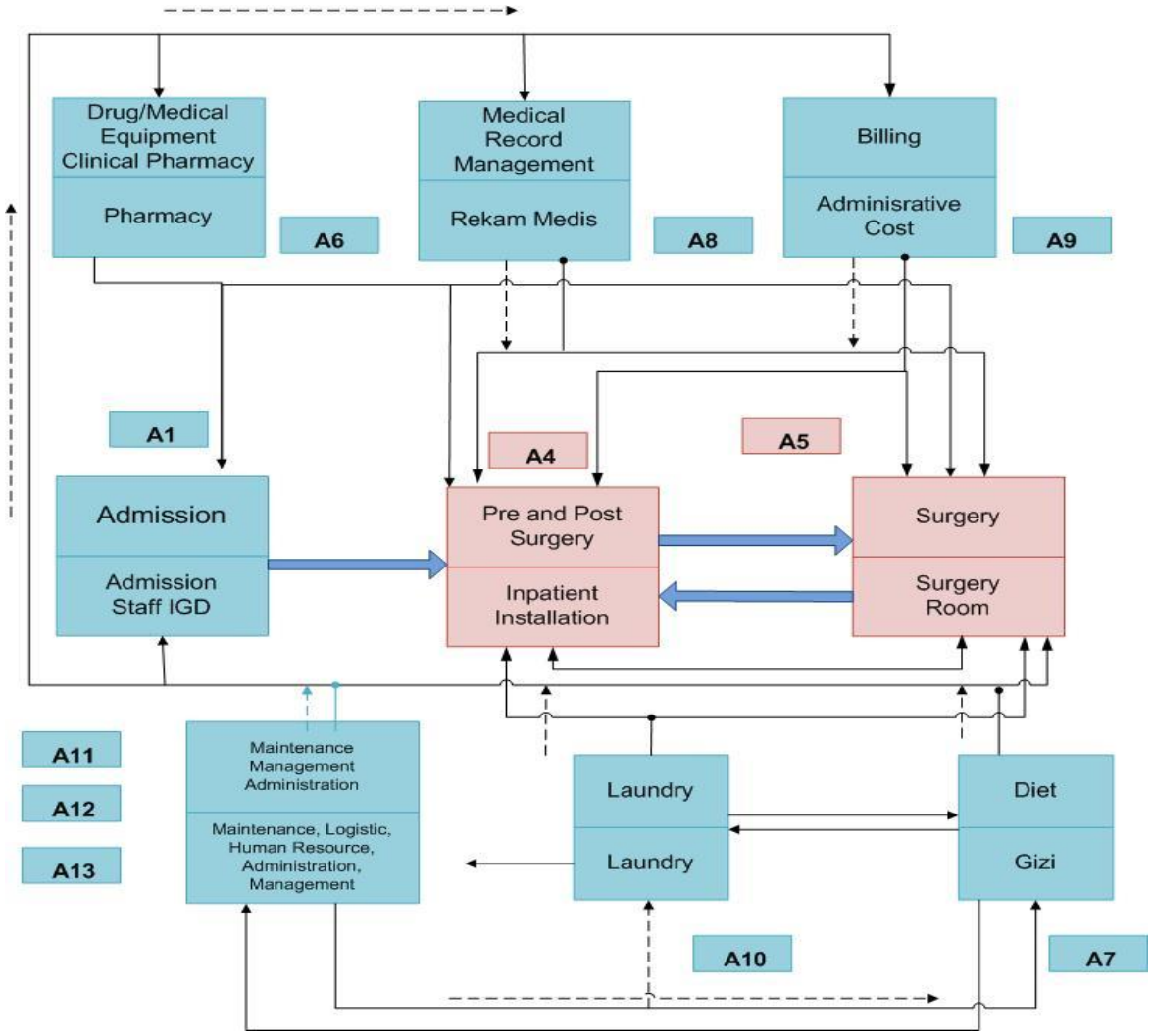

Figure 2. Redesigning the Elective Section Caesarean Activities Based on Clinical Pathway

After surgery, the patient was again transferred to the obstetrics and gynecology inpatient installation for postoperative care (A4). Unchanged support services consist of pharmaceutical

(A6), nutritional (A7), laundry (A10), medical records (A8), logistics A11), maintenance of facilities, security, and environment (A12), and administrative and management (A13). Therefore, they are redesigning the elective CS activities based on CP, as shown in Figure 2. The recommended change is the processing of organic waste in environmental maintenance activities. One way of processing organic waste is by recycling organic waste through the composting process (Sinaga et al., 2010). Composting is a process of processing organic waste into new materials and fertilizing the soil (Setyaningsih et al., 2017; Suwatanti & Widianingrum, 2017). Composting suitable for the hospital environment does not cause environmental pollution such as odors, bring vectors, reduce the aesthetic, and improve the economic value of the garbage.

Besides, organic waste processed into compost can also be processed by eco enzymes. Eco enzymes are fermented organic solutions from fresh vegetable waste, fruit waste with the addition of brown sugar and water using selective microorganisms such as yeast and bacteria (Harahap et al., 2021). Eco enzymes are helpful as natural disinfectants, which can be used as a household cleaner, detergent, body care, car care, air purification, deodorizer, food preservation, insecticide, organic fertilizers, pesticides, etc. catalysts (Rasit et al., 2019).

Researchers suggest RS W train human resources for environmental maintenance processing of organic waste, thus producing compost and eco enzymes. Compost is needed to fertilize plants in the garden area in a large open hospital area. Eco enzymes are expected to provide economic benefits and reduce chemical waste to reduce the burden on hospital wastewater treatment plants.

Redesigned elective CS CP activities reduce the cost of clinical assessment activities by Rp. 321,104 and laboratory activities by Rp. 126,854. The calculation results of elective CS unit cost based on CP using the ABC method without the part-time doctor and nurse costs Rp. 5,097,973. Redesigned CS CP activity reduces the unit cost by Rp. 447,958. The calculation of the unit cost of redesigned elective CS based on CP with the ABC method can be seen in Table 2.

Table 2. Unit Cost of Redesigned Elective Caesarean Section Based on Clinical Pathway with The ABC Method

	Activity	DC	IDC	UC Elective CS Based on CP
A1	Admission service	1.485	55.617	57.102
A4	Pre- and post-surgery	312.324	907.485	1.219.809
A5	Surgery	951.909	1.375.277	2.327.186
A6	Pharmacy	0	162.117	162.117
A7	Nutrition	0	381.926	381.926
A8	Medical records	0	101.371	101.371
A9	Administrative treatment costs	0	229.103	228.846
A10	Laundry	0	619.618	619.618
		1.265.718	**3.832.514**	**5.097.973**

Table captions: DC=*Direct Cost,* IDC=*Indirect Cost*
Source: Documents and Interviews, processed

This finding is the same as research by Abdalla et al. regarding the cost analysis of abdominal and pelvic CT scan procedures using the ABC method. After correcting the procedure, it was found that the cost reduction was 6.21 percent (Alrashdan et al., 2012). Furthermore,

research conducted by Watanabe and Kaneda said that the management of the production process to use ABC management at an institute of electronics, information, and communication reduces the activity of the production process by 12 percent (Watanabe & Kaneda, 2004). The research result Cannavacciuolo et al. mentioning that the ABC method supports cost control efforts, identify the cost of each activity of CP and is the reason for the redesign of clinical pathways (Cannavacciuolo et al., 2015).

Using ABC to improve service processes, such as redesigning elective CS CP in this study, is known as ABC management. ABC management is the management of service process activities to increase the value of benefits received by customers. ABC management uses activity cost analysis to provide recommendations to hospital management in strategic decision making, tariff determination, marketing strategies, and customer profitability (Ridderstolpe et al., 2002; Tsai, 1998)

The condition of the COVID-19 pandemic, which is currently still underway, has had a significant impact on the world of health. Cost analysis using the ABC method is a tool for hospitals to help restructure their business strategy. This ABC management method allows hospitals to provide services efficiently while maintaining the quality of service (Okutmus & Ergul, 2013).

The condition of the COVID-19 pandemic, which is still ongoing, has had a significant impact on the economy in the world of health, both public and private services. Financial risks faced by the RS are an increase in costs for controlling the outbreak, preventing the spread of infection, increasing the number of sick employees, and restrictions on service capacity (Bloom et al., 2018). COVID-19 also impacts the decline in public confidence in health care facilities (Blendon et al., 2014). It also raises the impact of financial risk in decrease inpatient care visits to the hospital. Cost analysis using the ABC method is a tool for hospitals to help restructure their business strategies. ABC management method allows hospitals to provide services efficiently while maintaining a quality of service (Okutmus & Ergul, 2013).

The implication of this case study research theory is that information about the unit cost of each activity in elective CS based on CP is expected to encourage cost awareness of the involved human resources. The practical implication of this research found non-value added activities in elective CS CP. It is recommended that the hospital redesign the CP activities and manage the socialization to related human resources. Redesigning the elective CS CP activity will reduce the unit cost by 8%. This study provides an opportunity for further researchers to examine other non-value-added activities and the influence of elective CS CP socialization to the caregiving professionals on the implementation of elective CS CP.

CONCLUSIONS

Based on the results and discussion of the analysis of elective CS unit cost calculations based on CP using the ABC method, the elective CS unit cost based on CP using the ABC method without part-time doctors and nurses of the operating room installation is found to be Rp. 5,545,931. The

non-value-added activities in elective CS CP are clinical assessment in the ER, laboratory activities, and organic waste treatment. Redesigning elective CS CP by eliminating non-value-added activities results in a unit cost of Rp. 5,097,973. The cost after redesigning elective CS CP is decreased by 8.79 percent. This decrease indicates that W Hospital should redesign their cost analysis using ABC with particular or non-value-added activities.

This research has limitations. Due to the limited time, the researcher did not make observations; thus, other non-value-added activities may still be found. This research could be continued by conducting observations to add information on non-value-added activities. The researchers suggest that W hospital redesign the elective CS CP activities to eliminate non-value-added activities and reduce unit costs. The redesigned elective CS CP is recommended to be disseminated to related human resources.

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