Research Article

Strengthening Competence of Hospital Data Management to Control The Quality of Cesarean Section Rate in Banten Province, Indonesia

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Abstract

Cesarean delivery dramatically increased worldwide, including in Indonesia, especially after the implementation of National Health Insurance, with a steady increase of 2-3% every year. This study aims to evaluate the effect of guidance in implementing the Robson Classification in cesarean section quality control in hospitals. Three hospitals in Banten were enrolled in this study: one public hospital and two private hospitals. Each hospital's staff were given online and offline training on quality control of cesarean section, managing cesarean section data, data entry, data analysis and presentation using Robson Classification. Participant's knowledge and attitude were collected before and after intervention using a standardized questionnaire. The results showed that the intervention improved many aspects of the workflow and knowledge of the hospital staff regarding cesarean section. There was an increase of up to 77.7% in digital data management, a 23.6% increase in routine meeting activities, and a 29.5% increase in cesarean quality control. The Robson classification system was implemented successfully, increasing the staff's ability to identify the groups needing cesarean sections more effectively. Guidance on data management for cesarean section increases the ability of the three hospitals in Banten to control cesarean section using Robson's Classification. Guidance methods can be used to assist other hospitals in controlling cesarean section.

Keywords: Robson Ten Group Classification System, cesarean section, quality control, data management.

Penguatan Kompetensi Pengelolaan Data Rumah Sakit untuk Pengendalian Kualitas Angka Operasi Caesar di Provinsi Banten, Indonesia

Abstrak

Persalinan sesar meningkat secara dramatis di seluruh dunia, termasuk di Indonesia, terutama setelah diberlakukannya Asuransi Kesehatan Nasional, dengan peningkatan stabil sekitar 2-3% setiap tahun. Studi ini bertujuan untuk mengevaluasi efek panduan dalam menerapkan Klasifikasi Robson dalam pengendalian kualitas operasi sesar di rumah sakit. Tiga rumah sakit di Banten diikutsertakan dalam studi ini: satu rumah sakit umum dan dua rumah sakit swasta. Pegawai di setiap rumah sakit diberikan pelatihan online dan offilen tentang pengendalian kualitas operasi sesar, pengelolaan data operasi serar, entri data, analisis data, dan presentasi menggunakan Klasifikasi Robson. Pengetahuan dan sikap peserta dikumpulkan sebelum dan setelah intervensi menggunakan kuesioner berstandar. Hasil menunjukkan bahwa intervensi meningkatkan banyak pada aspek alur kerja dan pengetahuan pegawai rumah sakit tentang operasi sesar. Terjadi peningkatan hingga 77,7% dalam manajemen data digital, peningkatan 23,6% dalam kegiatan pertemuan rutin, dan peningkatan 29,5% dalam pengendalian kualitas operasi sesar. Sistem Klasifikasi Robson berhasil diterapkan, meningkatkan kemampuan staf untuk mengidentifikasi kelompok yang memerlukan operasi sesar dengan lebih efektif. Panduan tentang manajemen data untuk operasi sesar meningkatkan kemampuan ketiga rumah sakit di Banten dalam mengendalikan operasi sesar menggunakan Klasifikasi Robson. Metode panduan ini dapat digunakan untuk membantu rumah sakit lain dalam mengendalikan operasi sesar.

Kata kunci: Sistem klasifikasi sepuluh grup robson, operasi sesar, kontrol kualitas, manajemen data.

Introduction

The rate of cesarean delivery was dramatically increasing worldwide and in Indonesia.[1] This figure has increased progressively worldwide in recent decades, including in lower-middle-income countries. Basic Health Research (Riset Kesehatan Dasar/ *RisKesDas*) data in Indonesia reported that the caesarean section (CS) rate during 2010–2013 was 9.8% for the national average.[2] Based on analysis of CS data from the National Health Insurance (Jaminan Kesehatan Nasional/JKN*)*, the graph showed an increase in the number of CS cases compared to the total deliveries in the JKN program during 2015-2019. Since the implementation of JKN, the trend of cesarean delivery has increased nationally from year to year.[3] The increase in CS rate could be seen as an access improvement or indicate poor pregnancy management service quality from before and during pregnancy up until delivery or could be misappropriation (without proper medical indications).[4] In 2014, out of 673,917 deliveries, 52% were via CS. This proportion was comparable in subsequent years: 55% in 2015, 57% in 2016, and 59% in 2017, based on approximately 1.2 million deliveries. In 2019, the rate of CS reached 36% of all childbirths, surpassing the World Health Organization's (WHO) recommended range of 15-20% annually. Based on the utilization review, the CS rate tends to increase with four factors that can influence this figure: profession, community, service system, and financing. Rising CS rates are a major public health concern and cause worldwide debates due to potential maternal and perinatal risks associated with this increase, inequity in access and cost issues.[4]

The Indonesian Obstetrics and Gynecology Association in 2020 published a self-assessment guideline as an instrument to control the CS rate, which adopted the Robson classification. In 2014, WHO conducted a second systematic review of user experience with the Robson Classification to assess the pros and cons of its adoption, implementation, and interpretation and identify barriers, facilitators, and potential for adaptation.[5] The WHO proposes the Robson Classification system as a global standard for assessing, monitoring, and comparing CS rates within health facilities over time and between facilities.[6] The outcome measure was the CS rate, assessed by the number of births by CS divided by the total number of births. Although the ideal or optimal caesarean rate is unknown, WHO emphasizes that CS is effective in saving maternal and infant lives, but only when it is used for medically indicated reasons.[7] Ultimately, every effort should

be made to provide caesarean sections to women in need rather than striving to achieve a specific rate.[8] The WHO envisions that the information stemming from the classification can be a powerful tool to inform practice.[9] The classification will allow for stratification of CS rates in more uniform groups of women and assessing CS rates in relation to other perinatal outcomes and processes (e.g. rates of oxytocin usage, postpartum hemorrhage, newborn outcomes, length of labor).[10] Robson's classification is based on women, generally divided into ten groups of pregnant women treated for childbirth.[11] This classification is simple, easy to use, clinically relevant, and prospective. This allows for comparison and analysis of CS rates across groups of women. The Robson Classification can be used as a tool to assess treatment rather than to provide treatment recommendations, and it is up to the hospital to decide which treatment is appropriate based on results and other available evidence.[12]

In Indonesia, a National Survey has been conducted using the Robson Classification, Sungkar et al did trials in Health Centers in Indonesia and found that group 10 contributed the most.[13] Group 10 (women with single head, gestational age <37 weeks, and previous scar) held the largest group (28.1%), followed by group 1 (17.6%) and group 3 (15.2%).[10] In addition, Sihombing et al also considered that women with a maternal age of 42 weeks, multiple pregnancies, and maternal height less than 145 cm were more likely to have a CS.[14] Sanglah Tertiary Hospital and Department of Obstetrics and Gynecology and Sanjiwani District Hospital, Bali, Indonesia, also did a retrospective descriptive study in 2018, in which the highest contribution to the overall CS rate was from Robson group 10 and group 4.[15] They recommended the use of the Robson classification system as an audit tool to enable CS rate reduction strategy to be carried out on certain indications. A study based on two government hospitals in Bali also demonstrated similar cesarean section rates, with both hospitals' CS rates higher than the national rate (34.3% and 21.5% vs 9.8% respectively). These rates were also far above the WHO requirements.[15]

Our research aims to determine if the study hospitals possess the necessary competencies to manage data related to cesarean section (CS) quality control. Specifically, we intend to identify the required data for managing CS records, collect this data via data entry, present the data using the Robson Classification Table, and conduct an analysis based on the Robson classification. Robson's tool has not

been fully mastered in Indonesia since there is a tendency for the cesarean section rate in Indonesia to increase, so guidance is still needed.

Methods

This is a prospective, before-and-after interventional study that conducts technical audits of cesarean delivery data and provides feedback to medical professionals. We collected primary data from three hospitals in Banten, Indonesia. Initially, data was gathered before any technical guidance was provided. Following this, our research team offered both online and offline technical guidance. After the guidance sessions, we assessed the data again and provided recommendations to control the cesarean section rate. In a workshop in Banten, hospitals with high cesarean section rates were invited to participate in a pilot project. From the willing hospitals, three were selected as subjects for this study: one public hospital and two private ones, namely Hospital A, Hospital B, and Hospital C. This prospective study took place in the province of Banten, Indonesia, and was initiated based on findings from the national workshop on controlling cesarean section rates held in August 2021. The research spanned five months, from 1st October 2021 to 31st March 2022.

The research team reached out to each hospital individually via mail, seeking permission for an intervention study. The letter addressed to the hospital director proposed the collection of all cesarean section data. Before data collection began, an internal ad hoc team was to be established at each hospital. This team would comprise members from the medical committee, obstetrics and gynecology staff, pediatricians, medical staff and/or nurses, and medical record personnel. Additionally, a designated point of contact was assigned to address any data clarification needs by the research team. Prior to data collection, an online briefing about the research was conducted in December 2021. Technical guidance was provided online and offline to the staff of the three hospitals, starting after the ethical review results were received in January and extending through February 2022. Data for the pre-intervention phase was collected retrospectively between October and December 2021 and stored on Google Drive. Prospective data collection followed from January to February 2022. A questionnaire was employed to evaluate the results and streamline the tabulation process. The inclusion criteria encompassed data from staff management at each Banten hospital. The exclusion criterion was any staff member who did not participate fully in the technical guidance sessions.

Result

As per the research timeline, we undertook the following steps: initial preparations, online technical guidance, and initial data collection. We then provided offline technical guidance through visits to the three hospitals. Following the guidance, we conducted a post-guidance evaluation using the same questionnaire that was used pre-guidance. Additionally, we assessed post-guidance data from January to February 2022, encompassing a recapitulation based on Robson's criteria and the subsequent reporting.

Preparation of Research Implementation

An online meeting was held in preparation in December 2021 with the three hospitals in Banten, The Health Social Security Administering Agency (Badan Penyelenggara Jaminan Sosial/BPJS Kesehatan) Banten and The Quality and Cost Control (Kendali Mutu Kendali Biaya/KMKB) team. These three hospitals were selected and proposed at The Quality and Cost Control workshop in August 2021, considering the highest cesarean section rate in the Banten area, representing one general hospital (Hospital A) and two private hospitals (Hospital B and C). According to the 2020 data from The Health Social Security Administering Agency of Banten, the cesarean section (CS) rates were 76.6% for Hospital A, 60.3% for Hospital B, and 73.6% for Hospital C. From January to August 2021, the CS rates increased to 78.5% for Hospital A, 71% for Hospital B, and remained at 70% for Hospital C. During the meeting, we explained the objectives and benefits of the research, the research process, and seek approval of participation in this research.

Technical Guidance

Technical guidance was carried out after the ethical review had been approved. It consists of synchronous and asynchronous online and offline WhatsApp meetings. Before the guidance commenced at the three hospitals, each was tasked with gathering delivery data for the three preceding months: October, November, and December 2021. This data was presented in two tables. The first table provided patient details, including identity, parity, history of cesarean section, number of fetuses, fetal presentation, gestational age, and mode of birth. The second table was dedicated to the Robson Classification Report. Additionally, an evaluation was conducted using a questionnaire during this phase.

Online Technical Guidance

Technical guidance was conducted through a 2.5-hour online Zoom meeting attended by 50 participants. These participants included the Banten Quality and Cost Control team and teams from the three hospitals. Each hospital team had five representatives, including OBGYN specialists, midwives or nurses, medical records or IT personnel, and other members associated with the quality committee. Three individuals facilitated the session: the primary researcher and two assistants. Additionally, the online meeting was overseen by the management team of The Health Social Security Administering Agency for the Banten Province.

Technical guidance aims to strengthen the competence of hospital data management in quality control of caesarean section, identify the data needed to manage CS data, collect data in the form of data entry, present data using Robson Classification Tables, and perform analysis based on Robson Classification.

The Robson Classification, recommended by the WHO for all countries, serves as a standard tool to periodically compare CS rates both within and across hospitals (in multicenter studies). As such, The Quality and Cost Control Team employs the Robson classification to assess cost and quality control. Using this classification, one can identify and analyze which demographic groups have the highest cesarean section rates within individual hospitals and across broader regions and provinces. While the Robson Classification quantifies the number of cesarean sections, it doesn't provide follow-up recommendations or indicate the expected quality.

To aid in applying this classification, the research team introduced the Robson Classification Calculator app, available for free download on the Play Store. This app simplifies the process of sorting data into Robson categories. Additionally, the team has set up a shared Google Drive folder containing an Excel template for data collection, which also presents the data in the format of Robson's recapitulation.

Offline Technical Guidance

Face-to-face meetings were held at each of the three hospitals and facilitated by a team of three. Hospital C gathered 17 participants, including members from The Health Social Security Administering Agency, the Quality and Cost Control team, hospital directors, deputy directors, three OBGYN specialists, and other Hospital C staff

representatives. Similarly, Hospital B's meeting was attended by 17 individuals, encompassing representatives from The Health Social Security Administering Agency, the Quality and Cost Control team, the hospital's director, two OBGYN specialists, and various Hospital B staff members. Lastly, the session at Hospital A was graced by 19 attendees. This group included members from The Health Social Security Administering Agency, leadership from the Region Public Hospital (the director and the deputy director), three OBGYN specialists, and additional staff representatives from Hospital A.

During the offline guidance, participants were introduced to the necessary Excel data formats, and the method for presenting data using the Robson recapitulation was discussed. Attendees were also guided on how to analyze data following the Robson classification manual. Additionally, a review of the previously collected data was conducted. Data at Hospital C was recorded manually in the birth registration book, while Hospitals A and B's data were recorded electronically but still not used optimally. There was confusion regarding the classification of the onset of labor, leading to incorrect group categorization. Examples of specific cases were provided to clarify and provide guidance on how to compute using a formula that would be integrated into the Robson Classification Report Table. This guidance process aims to foster a uniform understanding of the Robson classification boundaries, ensuring that the data gathered aligns with Robson's definitions before being integrated into each hospital's medical record system. Key variables to consider encompass obstetric factors and those assessing the number of cesarean sections. The six essential obstetric variables for the Robson classification are parity, history of prior cesarean sections, the onset of labor (whether spontaneous, induced, or cesarean delivery prior to labor), number of fetuses (single or multiple pregnancies), gestational age (either 37 weeks and above or below 37 weeks), and fetal position (head, breech, or transverse). Data about the delivery mode was sourced before the patient gave birth, and records from the three hospitals were manually collected (Table 1).

Hospital C operates its own cost and quality control program. The hospital processes data manually and retrospectively. This involves accessing the medical record based on the patient's register number, sorting through all pregnant patients, reviewing hard copies of each medical record individually, and then manually categorizing them using the Robson application. The results

are then entered into an Excel spreadsheet, where calculations are performed based on specific formulas before the data is transferred to the Robson Classification Report Table. Hospital C faces several challenges, including reliance on physical hard copies instead of electronic storage, unfamiliarity with the Robson formulas needed for the Robson Classification Report Table, lack of understanding of how to utilize the Robson Flow Charts, confusion about categorizing into Robson groups, and a lack of clarity regarding the operational definitions of Robson variables and the definition of labor onset.

Hospital B integrates data into the Robson group for each patient upon discharge, utilizing an electronic medical record system. Daily, the maternity ward staff logs information for patients in labor and those scheduled for elective cesarean sections. This data is then cross-referenced with the daily hospital visit records. At each month's end, the hospital's internal audit team reviews the delivery room data, reconciling it with the monthly tally from the Hospital Information System. For the month of October, data was retrieved retrospectively from the electronic medical records. Based on each patient's visit date, the information is categorized via the Robson application, then manually sorted by group, and finally entered the Robson Classification Report Table. The research team advised keeping the data in its original format, based on visit dates, without preliminary processing. Hospital B encountered challenges such as data entry errors in Excel and the Robson application's calculator.−Hospital B, with a cesarean section rate of 75%, serves as a referral hospital. It handles a significant number of placenta previa cases, resulting in many breech-positioned fetuses. Additionally, certain medical indications don't fit neatly into established groups. While attempting to adapt to on-the-ground realities, the hospital faces quality and cost control challenges. A quality control example is determining the optimal timing and gestational week for inducing labor in the hospital.

Hospital A operates with its established medical record system. A team of five staff members, including medical records and IT personnel, is responsible for inputting Robson data. They utilize a delivery form provided by the Ministry of Health, and data is organized monthly. Every 2-3 days, case counts are computed, the data is processed through the Robson application for categorization, and an Excel sheet is then created. Subsequently, the data is manually sorted into the Robson Classification Report Table. The delivery form from the Ministry of Health, presented in hard copy, chronicles the patient's journey from admission (starting from the ER) and includes medical record status, childbirth details, and the subsequent steps, such as moving to the observation room and then to the treatment ward. Only at the end of this process is the patient's data placed into the Robson group, calculated using a specific formula, and finally added to the Robson Classification Report Table. Most patients at Hospital A are referrals, and the institution records a significant number of births as a Regional Public Hospital. The hospital faces challenges like misinterpreting terms like spontaneous/induced/pre-labor cesarean section, leading to inaccuracies in groups 1-4 and the tendency to input data by a group rather than by date. The research team recommended categorizing patients into groups upon admission, irrespective of the delivery method. Only after this categorization should the total counts for spontaneous deliveries and cesarean sections be determined.

Table 1. Process of Data Management Before and After Technical Guidance in The Three Hospitals

Topic of Technical Guidance	Before Technical Guidance	After Technical Guidance
Required data	Data availability Data at Hospital C is recorded manually in the birth registration book, while Hospital A and B have been recorded electronically but are still not maximally used.	The data is already available and verified as accurate.
Data table	The data needed from the three hospitals is still lacking in adequacy and quality.	The data is sufficient and of good quality.
Robson's Recapitulation	Available, but did not understand the operational definition, onset of labor, and calculation of the number of CS in the group.	The operational definition is appropriate.
Data Analysis	Overall, the CS rate already exists, but there is no proportion of the Robson group, and they did not understand how to do data analysis.	The staff is aware of the 80% cesarean rate, understands which group contributes most to this high frequency, and knows how to analyze the data effectively.

Data Management Before and After Technical Guidance

After the technical guidance provided for January and February, it's evident that all three hospitals have grasped the proper and correct methods for data input and review. They can now independently apply their knowledge to the Robson Classification Report Table and effectively analyze data, pinpointing groups with high CS rates. Data was collected through Excel tabulation on Google Drive, where the research team carried out monthly follow-ups. From our interventions, online and offline technical guidance have succeeded in conducting self-assessment to manage the high cesarean section rate in their hospital and how to follow up in the future.

Each hospital needs to focus on three critical aspects for effective analysis. First, they must ensure the quality of their data, confirming its validity. Second, they should acknowledge the variation in population types across different hospitals. Lastly, a thorough calculation of cesarean sections is essential. This involves determining the total number of cesarean procedures, dissecting the figures across the ten designated groups, and pinpointing those groups with particularly high numbers. Identifying these groups will guide hospitals in deciding which specific segments should be prioritized for monitoring and control. The key is that the team from the hospital understands the meaning of the operational definition in the Robson group; if there is a misunderstanding, then the data entered the group is also wrong. Robson Classification Calculator application only helps to decide grouping. This instrument can only inform about the problem, how high the number is and which group it comes from, but it cannot provide a solution. For this case, the hospital leadership is expected to control the cesarean section rate according to the right indications, according to the 10 Robson groups, and assisted by the Quality and Cost Control team. This guidance does not indicate who is wrong or right, so it is hoped that the hospital can self-assess what needs to be improved in each group. If it has been established, the hospital and the Quality and Cost Control team can see whether the trend is increasing or decreasing so that it can be controlled. The success of this intervention requires the collaborative efforts of hospitals, primary health facilities, and the health department. At its core, the accuracy and integrity of data are crucial. If the data isn't reliable, errors will arise in group categorization. Every piece of delivery data should be accurately categorized within one of the Robson groups. For instance, in our sample population, cesarean section results for singleton term pregnancies with a head presentation range between 35-42%. This is notably higher compared to the WHO's analysis of 10%.

In this study, the effectiveness of data management is evident from the data table, Robson recapitulation, and data analysis (as shown in Table 2). Prior to the guidance, the collected data was inadequate and lacked quality, with no available Robson recapitulation and no data analysis conducted. However, post-guidance, the data is both sufficient and high-quality. With the available Robson recapitulation, it's now possible to analyze the data and identify which group has the highest incidence of CS (Table 3).

Table 2. Results of Data Management Before and After Guidance in The Three Hospitals

Topic of Technical Guidance	Before Technical Guidance	After Technical Guidance
Data Table	The data needed from the three hospitals is still lacking in adequacy and quality.	The data is sufficient and of good quality.
Robson's Recapitulation	Not yet available	Available
Data Analysis	Data is available but not yet analyzed	Data was analyzed

Table 3. Tabulation of the Questionnaire Before and After Guidance

The Questions	Answer		Hospital C n/N		Hospital B n/N		Hospital A n/N	
			Before	After	Before	After	Before	After
Did you get support from the hospital directors?	yes		9/9	5/5	6/6	5/5	17/17	5/5
	no		0	0	0	0	0	0
Are there facilities and infrastructure used to obtain data? (electronic or manual from medical records)	Yes, Complete facilities		9/9	5/5	6/6	5/5	5/17	4/5
	Not complete		0	0	0	0	12/17	1/5
	None		0	0	0	0	0	0
Are there human resources working in teams to collect data?	Yes, Competent		9/9	5/5	6/6	5/5	10/17	5/5
	Not competent		0	0	0	0	7/17	0
	None		0	0	0	0	0	0
How is the data management system used (using the Robson application and electronic medical records)?	Full digital		0	0	4/6	0	0	0
	Partially digital		4/9	5/5	2/6	5/5	7/17	4/5
	Manual		5/9	0	0	0	10/17	1/5
Are regular meetings held at least once a month (periodic) in quality control?	Yes		9/9	5/5	5/6	5/5	13/17	5/5
	None		0	0	1/6	0	4/17	0
How are the activities provided by the Cost Control Quality Control team in managing cesarean section control data? (There are offline and online guidance packages, including data identification, data collection, data presentation, data analysis and follow-up recommendations.)	Yes		9/9	5/5	6/6	5/5	12/17	5/5
	None		0	0	0	0	5/17	0
What is the knowledge of the team of identifying data, collecting data, presenting data, analyzing data and recommending follow-up?	a.	Able to do independently	3/9	2/5	3/6	5/5	2/17	2/5
	b.	Still need guidance	5/9	3/5	3/6	0	15/17	3/5
	c.	Not able to do	1/9	0	0	0	0	0
How many cesarean sections did you get based on the Robson classification report table at your hospital?			80%	80%	60-70% 75%	64%	69% 75% (Okt)	78%
How is the satisfaction of the hospital team with the quality control activities of cesarean section?	a.	Very pleasant	9/9	5/5	6/6	5/5	16/17	5/5
	b.	Not pleasant	0	0	0	0	1/17	0

Discussion
Assessment of the questionnaire before and after Technical Guidance

The questionnaire was administered both before and after the guidance sessions. During the initial questionnaire distribution, representatives from each hospital participated, including directors, the OBGYN department, management, midwives, and nurses. As a result, 5 to 10 people from each hospital attended during the guidance, leading to more than five individuals filling out

the questionnaires. However, after the guidance, only five responses were obtained for the questionnaires, as each represented category had just one participant.

In this study, it can be assessed that the three hospitals received 100% full support from the hospital leaders to conduct research before or after technical guidance. Hospital B has 100% complete facilities and infrastructure used to collect data; there are 100% competent human resources who can work in teams to collect data.

Prior to the guidance, only 33.3% of the hospitals partially utilized a digital data management system. However, after the guidance, its usage reached 100%. Monthly routine meetings to monitor hospital quality were conducted 83.3% of the time before the guidance. Post-guidance, these meetings became a consistent practice, occurring 100% of the time. The Cost Control Quality Control Team consistently, at a rate of 100%, managed data and controlled cesarean section rates both before and after the technical guidance. This process encompassed offline and online guidance stages, including data identification, collection, presentation, analysis, and the provision of follow-up recommendations. Before the guidance, only half of the team was independently knowledgeable, requiring additional assistance, while the other half needed guidance. However, post guidance, the entire team, 100% of them, had gained independent expertise. At Hospital B, based on the Robson classification report table, the cesarean section rate was 70% before the guidance, which decreased to 64% after the guidance. The Hospital B team also expressed 100% satisfaction with the cesarean section quality control activities.

Before the guidance at Hospital A, 70.5% of the required facilities and infrastructure were incomplete. However, 80% of these facilities and infrastructure were deemed complete post-guidance. Initially, only 58.8% of the human resources were proficient and able to collaborate in data collection, but this figure surged to 100% competency after the technical guidance. Prior to the guidance, Hospital A utilized manual data management systems at a rate of 58.8%; post guidance, there was a shift, with 80% of the systems being at least partially digitalized. Regular monthly meetings aimed at overseeing hospital quality were conducted 76.4% of the time before the guidance. However, after the guidance, these meetings became consistently monthly occurrences at a rate of 100%. The Quality Control Team for Cost Control was previously active in data management and cesarean section control at a rate of 70.5%. After the guidance, their engagement rate rose to 100%, encompassing tasks like data identification, collection, presentation, analysis, and providing follow-up recommendations. Before receiving guidance, 88.2% of the team needed assistance with these tasks, but post guidance, only 60% still required such support. In terms of cesarean section rates based on the Robson classification, Hospital B recorded a rate of 75% prior to the guidance, which

increased slightly to 78% after. The satisfaction level of the Hospital A team concerning cesarean section quality control was 94.1% before the guidance, but post guidance, it peaked at 100%.

All three hospitals had the full backing of their respective leaders to undertake this study. Hospital B already had comprehensive facilities and infrastructure for data collection, while Hospital A's setup remained incomplete. However, the human resources at both Hospital A and B were competent and collaborated effectively to gather the required data. Both hospitals predominantly utilized digital methods for data management via the Robson application and medical records, although some processes were still manually executed. Prior to the guidance, regular monthly meetings for quality control were sporadic at both Hospital A and B. However, post-guidance, these meetings became consistently monthly.

At Hospital B, even before the guidance, the Cost and Quality Control team had initiated activities related to cesarean section data management. This included offline and online guidance packages covering data identification, collection, presentation, analysis, and subsequent recommendations. In contrast, Hospital A only commenced these activities consistently post guidance. Before receiving guidance, the team at Hospital B needed assistance with data identification, collection, presentation, and analysis, but afterwards, they were largely self-sufficient. On the other hand, while many in Hospital A's team became independent post guidance, a segment still required support. Both hospitals expressed satisfaction with the quality control measures implemented for cesarean sections. Before the guidance, Hospital B had a cesarean section rate between 60-70%, which rose to 75% afterwards. Hospital A reported rates of 69% before and 78% after guidance.

Our initial study across the three hospitals in Banten, Indonesia, revealed that, before any technical guidance, the highest contribution to cesarean sections came from the Robson Group 5: multiparous women with a history of cesarean, carrying a singleton fetus in cephalic presentation, and with a gestational age of 37 weeks or more. Post-guidance, each hospital showcased distinct groups with high cesarean rates. In January and February, Hospital A's predominant group was Robson 10, Hospital C's was Robson 3, and Hospital B's remained at Robson 5.

Implementing online and offline technical guidance led to notable changes in data collection

and input practices at the three hospitals in Banten. Prior to this guidance, the hospitals primarily relied on manual data collection from birth registration books. This manual approach resulted in several errors, such as unfamiliarity with operational definitions, incorrect data entry into the Robson group, and a lack of understanding of data collection and presentation in the form of the Robson Classification Report Table.

Post guidance, these hospitals displayed a marked improvement. They gained clarity on the operational definitions mastered using the Robson Calculator for appropriate group categorization. They became adept at collecting and presenting data autonomously within the Robson Classification Report Table. Monthly data collection is now spearheaded by dedicated teams at each hospital, comprising midwives, medical record and IT officers, and general practitioners specializing in midwifery. However, there remains a noticeable absence of involvement from Obstetrics and Gynecology specialists, whose expertise would be invaluable in ensuring data accuracy.

The interventions we introduced, encompassing online and offline technical guidance, have proven effective. These methods have equipped hospitals with the necessary tools to address the high cesarean section rates and established a foundation for future follow-ups and interventions.

Conclusion

Through guidance on cesarean section data management, the three hospitals in Banten have enhanced their capability to regulate cesarean sections using Robson's Classification. The approach, encompassing two hours of online and four hours of offline guidance for each hospital, has proven quite effective. The provision of resources, such as Excel table materials, a manual for classification, and the usage of Robson's calculator, alongside analysis guides, have been immensely beneficial. These guidance methods stand as a model that can be adopted by other hospitals aiming to control cesarean section rates better.

So, we suggest five recommendations. First, the implementation of quality control for cesarean sections must be carried out consistently and independently by hospitals to decrease the number of cesarean sections. Second, it is necessary to follow up with the recommendations of the findings. Third, it is necessary to monitor the CS rate as well as each Robson's group in accordance with the actions taken. Fourth, Supervision by the Cost and Quality Control Team is

required to control the number of sections, including implementing recommendations for improvement. Fifth, create a package of technical guidance on data management to guide other hospitals.

Acknowledgements

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