Research Article

How the Type of Surgery and Adherence to the Clinical Pathway Correlate with Quality Control and Cost Control in Endometriosis Surgery

Bagaimana Jenis Pembedahan dan Kepatuhan pada Clinical Pathway Berhubungan dengan Kontrol Kualitas dan Kontrol Biaya pada Operasi Endometriosis

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Abstract

Objective: This study examined the correlation of the type of surgery and adherence to the clinical pathway corresponding to the national guidelines in terms of quality and cost control.

Methods: Quantitative economic evaluation was conducted to assess the type of surgery and adherence to clinical pathways in terms of quality and cost control. The data were analyzed using the chi-square or Mann–Whitney test.

Result: Of the sample of 82 patients who had undergone laparoscopy or laparotomy, 54.9% had a laparoscopic procedure, while 45.1% had undergone laparotomy ; only 25.6% of the case procedures adhered to the clinical pathway. In general, it can be interpreted that, in a laparoscopy procedure, the potential risk that a mismatch will occur in quality control is up to 32 times that of a laparotomy procedure. Moreover, good adherence to the clinical pathway does not correlate with good cost control. Overall, of the 82 cases, only three (3.7%) showed a good fit for both quality control and cost control.

Conclusion: The type of surgery correlates with quality and cost control, whereas adherence to the clinical pathway does not correlate with either quality or cost control.

Keywords: endometriosis, laparoscopy, laparotomy, narional health insurance, surgery.

Abstrak

Tujuan: *Studi ini menguji korelasi jenis operasi dan kepatuhan terhadap jalur klinis yang sesuai dengan pedoman nasional dalam hal kontrol kualitas dan biaya.*

Metode: *Evaluasi ekonomi kuantitatif dilakukan untuk menilai jenis operasi dan kepatuhan terhadap jalur klinis dalam hal kualitas dan pengendalian biaya. Data dianalisis menggunakan uji chi-square atau Mann-Whitney.*

Hasil: *Dari sampel 82 pasien yang pernah menjalani laparoskopi atau laparotomi, 54,9% menjalani prosedur laparoskopi, sedangkan 45,1% pernah menjalani laparotomi ; hanya 25,6% dari prosedur kasus yang mengikuti jalur klinis. Secara umum dapat diartikan bahwa, dalam prosedur laparoskopi, potensi risiko terjadinya ketidaksesuaian dalam kontrol kualitas adalah hingga 32 kali lipat dari prosedur laparotomi. Selain itu, kepatuhan yang baik terhadap jalur klinis tidak berkorelasi dengan pengendalian biaya yang baik. Secara keseluruhan, dari 82 kasus, hanya tiga (3,7%) yang menunjukkan kesesuaian yang baik untuk pengendalian kualitas dan pengendalian biaya.*

Kesimpulan: *Jenis pembedahan berkorelasi dengan kualitas dan pengendalian biaya, sedangkan kepatuhan terhadap jalur klinis tidak berkorelasi dengan kualitas atau pengendalian biaya.*

Kata kunci: *endometriosis, jaminan kesehatan nasional, laparoskopi, laparotomi, pembedaahan.*

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INTRODUCTION

Endometriosis is a benign gynecological disease characterized by the presence of glands and stroma similar to those of the endometrium outside the uterine cavity; it is associated with pelvic pain and infertility. It has several clinical manifestations, with numerous progressions and recurrences.[1-3] The incidence of endometriosis is difficult to diagnose with certainty; this difficulty may be due to the lack of epidemiological studies that can be used as a reference and the invasive procedure that must be performed for diagnosing it.[1] Globally, it is estimated that 10% of women of reproductive age and around 30%–50% of women with infertility suffer from endometriosis.[4] In Indonesia, it is estimated that endometriosis incidence occurs among 13.6%–69.5% of the population with infertility.

Supporting examinations for diagnosing endometriosis can be performed using transvaginal ultrasonography, magnetic resonance imaging (MRI), and biochemical markers; however, since a definitive diagnosis can only be ascertained via laparoscopic procedures, many patients are not diagnosed until 4–10 years from the onset of symptoms.[5] Endometriosis surgery can be performed using a laparotomy or laparoscopy method. Previous studies have shown that laparoscopy surgery will allow the patients to lead a better life, and it is considered an effective procedure.[6,7] However, until now, there have been no data reported on the relationship between the type of surgery chosen in endometriosis cases and quality and cost control. Systematic studies reveal that pain, infertility and the length of time required for diagnosing the condition, as well as the high recurrence rate, may lead to a decrease in quality of life and are the major factors in predicting the associated healthcare budget.[8]

In addition, there are currently no data on the economic burden caused by endometriosis in Indonesia, but studies in the United States show that the costs for managing endometriosis patients could reach up to $2,801 US per year, and it is estimated that around $1,023 US or 86.4 hours per year are lost because of a decrease in productivity among endometriosis patients.[9] Medical practices in Indonesia are regulated by Law No. 24 of 2009, where article 44 states that doctors or dentists who perform medical practices must follow the prescribed medical service standards, which are further regulated by the Minister of Health Regulation No. 1438 of 2010 concerning medical service standards. Indonesian medical service standards consist of the National Guidelines for Medical Services and the Standard Operating Procedure (SOP), where the SOP is derived from the national guidelines. These procedures are delineated as practices in local health facilities, expressing the national guidelines in the form of Clinical Pathway or Clinical Practice Guidelines.

The national guidelines for dealing with endometriosis were established in 2013 by the Indonesian Society for Reproductive Endocrinology and Infertility, followed by the formulation of national guidelines for endometriosis management at Dr. Cipto Mangunkusumo Genaral Hospital. To this day, the national guidelines for endometriosis management have never been evaluated. Moreover, quality and cost controls at Dr. Cipto Mangunkusumo Genaral Hospital have not been evaluated, but internal data from 2014 reveal that there is a significant disparity between the total claim filed by Indonesian Case Base Groups (INA-CBGs) and the real cost borne by the National Hospital. Quality and cost control have been the major outcomes in health services management following the enactment of the National Health Insurance scheme in 2014; therefore, the application of national guidelines serves as a tool for providing proper health services that are consistent with the existing standards. Meanwhile, quality control is defined as a system that guarantees the delivery of effective, efficient, and good-quality health services that meet the patients' needs, while cost control is a system that guarantees the health care costs paid by the patients will result in services that fulfill their needs. Based on the issues mentioned above, this study explores the relationship between the type of surgery and adherence to national guidelines on the one hand and quality control and the cost of surgical procedures in on the other endometriosis cases at the Department of Obstetrics and Gynecology at Dr. Cipto Mangunkusumo Genaral Hospital.

METHODS

The research comprised a quantitative economic evaluation with a cross-sectional study design and an unpaired comparative categorical analytic method. Comparative analysis was carried out to examine the correlation between the types

of surgery (laparotomy or laparoscopy) and quality control and cost control. A comparative analysis was also conducted on the adherence to national guidelines with quality control and cost control. The sample in the study comprised endometriosis patients who underwent either laparotomy or laparoscopy surgeries at Dr. Cipto Mangunkusumo Genaral Hospital in 2016. The study's inclusion criteria covered patients with typical endometriosis complaints, that is, women who had been diagnosed with endometriosis. The laparoscopic or laparotomy surgical procedures were all performed at Dr. Cipto Mangunkusumo Genaral Hospital and paid for by the National Health Insurance System. The exclusion criteria were women who needed intensive care or suffered from other comorbid diseases that could affect the treatment cost, as well as women whose post-surgery diagnosis revealed conditions other than endometriosis.

The operational definition regarding adherence to guidelines is defined as good if 80% of the guidelines' components are carried out. The type of surgery covered in the study was based on HIFERI's National Guidelines for Medical Services for endometriosis and Dr. Cipto Mangunkusumo Genaral Hospital medical service guidelines. Meanwhile, as mentioned above, quality control was defined as a system that provides effective, efficient, and quality health services that meet patients' needs; the level of quality is measured from three components, that is, the complications that may arise during the surgery, duration of treatment after surgery, and mortality. In contrast, cost control is a system that guarantees that the amount paid by patients exclude the taxes, will give them health care that fulfills their needs.[10] Cost conformity is the entire cost of disease management, from initial diagnosis until surgery, incurred by the hospital for patient management consisting of medical, pharmaceutical, laboratory, and radiological services. The financing standards used in Dr. Cipto Mangunkusumo Genaral Hospital refer to the hospital's costing unit and INA-CBGs standard payment rates, which are based on the Regulation of the Minister of Health No. 59 of 2014.

Statistical analysis was carried out using the chi-square and Mann–Whitney tests while considering the distribution of data. The outcome of the study is expected to show the proportions of relative risks with p-values and confidence intervals. The data were processed using SPSS version 20.

Ethical Clearance

Ethical approval was granted by the ethics committee of the Faculty of Medicine, University of Indonesia (code: 18/UN2.F1/ETIK/2016). Informed consent was obtained from all of the participants.

RESULTS

This study was carried out on 82 patients who met the inclusion criteria. All subjects followed the study to completion.

Table 1. Research Subjects' Characteristics

	Total Number	%
Age (year)		
>50	6	7.3
<50	76	92.7
Type of Surgery		
Laparoscopy	45	54.9
Laparotomy	37	45.1
Adherence to Clinical Practice Guidelines		
Yes	21	25.6
No	61	74.4
Cost Control		
Adhering to PPK guidelines	9	11.0
Not adhering to PPK guidelines	73	89.0
Quality Control		
Adhering to PPK guidelines	28	34.1
Not adhering to PPK guidelines	54	65.9

Table 1 shows that most of the cases were women of premenopausal age, aged less than 50 years old, with 92.7% of the sample belonging to this group. The type of surgery was quite balanced, where 54.9% of the patients underwent a laparoscopy procedure, whereas the remaining 45.1% had laparotomy. Moreover, in the 82 cases, only 25.6% of the surgeries adhered to the national guidelines, which shows low compliance with the prevailing guidelines.

Table below showed the cost incurred by Cipto Mangunkusumo National Hospital and the amount paid by BPJS (National Insurance).

Table 2. Analysis of the Disparity between the Cost by Dr. Cipto Mangunkusumo General Hospital and the Amount Reimbursed by BPJS

	Median	Minimum	Maximum
Percentage of the cost incurred by Cipto Mangunkusumo National Hospital and the amount reimbursed by BPJS (%)	75.05	15.78	139
Cost disparity (Rp)	−5,160,954	−32,072,899	6,032,713
Adhering to PPK guidelines (Rp)	−6,872,183	−23,834,347	−320,395
Not adhering to PPK guidelines (Rp)	−4,343,356	−32,072,899	6,032,713

From Table 2, we may deduce that the disparity between the cost incurred by Cipto Mangunkusumo National Hospital and the amount reimbursed by BPJS is quite large, where the hospital only received 75% of the cost on average, up to Rp 5,160,954. The biggest loss that was borne by the National Hospital was Rp 32,072,899 (only 15.78% of the hospital's cost is reimbursed by National Insurance). The data revealed that there were only nine cases (10.9%) where National Insurance overpaid the cost incurred by the National Hospital.

From Table 3, we may conclude that, in most endometriosis surgeries, the costs borne by the National Hospital are higher than the reimbursement paid by National Insurance, which leads to a substantial loss to Dr. Cipto Mangunkusumo General Hospital.

Table 3. Correlation between the Type of Surgery and Adherence to PPK with Cost Control

Cost Control	Laparoscopy (*n* = 45)		Laparotomy (*n* = 37)		Total		*P-value*
	n	%	n	%	N	%	
Not adhering to PPK guidelines	39	86.7	34	91.9	73	89.0	
Adhering to PPK guidelines	6	13.3	3	8.1	9	11.0	0.503
	Good adherence to PPK guidelines (*n* = 21)		**Poor adherence to PPK guidelines (*n* = 61)**		**Total**		***P-value***
	n	**%**	**n**	**%**	**N**	**%**	
Not adhering to PPK guidelines	20	95.2	53	86.9	73	89.0	
Adhering to PPK guidelines	1	4.8	8	13.1	9	11.0	0.435

Only 11% of the cases have proper cost control (13.3% in laparoscopy cases and 8.1% in laparotomy cases), illustrating that cost control still leaves much to be desired. The uniform data distribution ultimately yields an insignificant *p*-value of 0.503, which means that neither laparoscopy nor laparotomy procedures have any effect on cost control. It is also apparent that there is only a single case with a good adherence to the PPK guidelines in addition to having a proper cost control and eight cases where adherence to the PPK guidelines is poor and cost control is also at odds with the PPK guidelines. Therefore, the conclusion is that good adherence to the PPK guidelines does not correlate with good cost control, but neither does poor adherence to the PPK guidelines correlate with poor cost control, where the lack of correlation is shown by the *p*-value of 0.435.

Table 4. Correlation between the Type of Surgery and Adherence to PPK with Quality Control

Quality Control	Laparoscopy		Laparotomy		Total		*P-value*	RR (Confi-dence Level 95%)
	n	%	n	%	n	%		
Not adhering to PPK guidelines	44	97.8	10	27.0	54	65.9	0.001	32 (4-230)
Adhering to PPK guidelines	1	2.2	27	73.0	28	34.1		
	Good adherence to PPK guidelines (n = 21)		**Poor adherence to PPK guidelines (n = 61)**		**Total**		***P-value***	
	n	%	n	%	n	%		
Not adhering to PPK guidelines	15	71.4	39	63.9	54	65.9	0.532	
Adhering to PPK guidelines	6	28.6	22	36.1	28	34.1		

Table 4 shows that, from the perspective of quality control between laparoscopy and laparotomy, only 2.2% of the cases were managed according to the PPK guidelines for laparoscopy procedures and 73% for laparotomy procedures; the overall percentage of the correlation between the type of surgery and adherence to the PPK guidelines with the total percentage of quality control is 34.1%, with a significant *p*-value at 0.001. It can be interpreted that, in a laparoscopy procedure, there is a potential risk that a mismatch in quality control will occur reaching 32 times that of a laparotomy procedure. From the perspective of adhering to the PPK guidelines, 6 cases showed good adherence to the guidelines and good quality control, whereas 22 cases showed poor adherence to the PPK guidelines and good quality control. After analyzing the correlation between adherence to PPK, wherein the outcome is evaluated from three components that is, complications that may arise after surgery, duration of treatment during the surgery, and mortality we learn that there is no correlation between good adherence to PPK with good quality control and vice versa, with a *p*-value of 0.532.

Table 5. Evaluation of the Type of Surgery and Adherence to PPK with Quality Control and Cost Control

	Laparoscopy		Laparotomy		Total		*P-value*
	N	%	n	%	n	%	
Cost control and quality control fail to meet PPK guidelines	39	86.7	9	24.4	48	58.5	<0.001
Cost control meets PPK guidelines	5	11.1	1	2.7	6	7.3	0.215
Quality control fails to meet PPK guidelines	0	0.0	25	67.6	25	30.5	<0.001
Cost control and quality control meet PPK guidelines	1	2.2	2	5.4	3	3.7	0.586
	Good adherence to PPK guidelines		**Poor adherence to PPK guidelines**		**Total**		***P-value***
Cost control and quality control do not meet PPK guidelines	14	66.7	34	55.7	48	58.5	0.447
Cost control meets PPK guidelines	1	4.8	5	8.2	6	7.3	1.000
Quality control meets PPK guidelines	6	28.6	19	31.1	25	30.5	1.000
Cost control and quality control meet PPK guidelines	0	0	3	4.9	3	3.7	0.566

From Table 5, we can still see a mismatch between cost control and quality control in the total cases (58.5%); meanwhile, only three samples (3.7%) show a proper match between quality control and cost control. Other data also show that the figure for cost control's adherence to PPK, at 7.3%, is far lower than the figure for quality control, which reaches 30.5%. There is a relationship between the type of surgery and quality control and cost control, where a laparoscopy surgery will produce quality control and cost control that does not meet the PPK guidelines, with a *p*-value < 0.001. It is also apparent that there is no relationship between good adherence to the PPK guidelines and quality or cost control, with a *p*-value = 0.566. Therefore, we may conclude that the type of surgery correlates with quality control and cost control, whereas adherence to PPK does not correlate with quality control or cost control.

DISCUSSIONS

We included 82 patients, where 45 had undergone a laparoscopy procedure and 37 a laparotomy procedure. These were cross-sectional samples taken from patients who underwent surgical procedures at Dr. Cipto Mangunkusumo General Hospital in 2016. It should be noted that the collected sample size was higher than the calculated sample size to avoid the possibility of data deficiency in some patients. However, as it turned out, all 82 samples could be analyzed in their entirety. Demographically, the patients were quite uniform, where 92.7% of them were of premenopausal age; this shows that endometriosis is a disease that is closely related to reproductive hormones and patients' menopausal status.

The data in the study showed a prevalence of endometriosis cases in postmenopausal women of 7.3%, which is in line with the findings in a study [10,11]. Which pointed to a figure of around 2.55%. The types of surgery were evenly distributed, with 54.9% of the patients undergoing a laparoscopy procedure and 45.1% undergoing a laparotomy procedure. As expected with the initial sample size of 35 women in the laparoscopy group and 35 women in the laparotomy group, the actual samples collected satisfied the data collection requirement, and the data could be analyzed further.

Evaluation of the adherence to the PPK guidelines revealed that only 23.6% of the services adhered to the current PPK guidelines, which is a rather low rate. This figure is consistent with those of other studies conducted in two hospitals in Indonesia, where the adherence to the PPK guidelines ranged from 0% to 28.12%[10,12]. In their study, Joris et al. stated that adherence to PPK is still controversial, where adherence is associated with improvement in some outcomes in some cases but not in all applications. A systematic review showed that the integration of PPK guidelines with information technology improves the outcomes of the services[13,14].

The poor adherence to the PPK guidelines we found in the study may be caused by several factors, that is, the heavy load and diverse cases that must be managed, the number of healthcare professionals involved, and finally, a lack of training on the procedure. These are the crucial points that show where improvement can be made by adjusting the PPK guidelines and intensifying the training on the guidelines; if these changes are made, all the physicians at Dr. Cipto Mangunkusumo General Hospital will be able to comply with the guidelines. Adjustment and adherence to the PPK guidelines can only be imposed by the institution's policymakers in conjunction with the proper use of information technology. Via such measures, all healthcare professionals will be aware of the guidelines and adhere to these standards. When good adherence to the PPK guidelines has been achieved, then we may know the effect on the existing patient services outcomes.

Analysis of the correlation between the type of surgery with quality control and cost control reveals that the laparoscopy procedure is at odds with the PPK guidelines, with a mismatch between quality control and cost control. This is contrary to HIFERI's recommendation that endorses laparoscopy as the preferred procedure because the potential for complication is lower and the procedure requires a shorter hospital stay. Analysis of the correlation between adherence to PPK guidelines and quality control and cost control revealed no discernible link between the two variables. This finding invalidates the researchers' initial hypothesis that a correlation would be present between good adherence to the PPK guidelines and quality and cost control. Therefore, we may conclude that the type of surgery correlates with quality and cost control, whereas adherence to PPK does not correlate with quality and cost control. The limitation of this research was that the costs were not calculated according to the actual unit cost. Instead, they were based on the total costs incurred by Dr. Cipto Mangunkusumo General Hospital.

CONCLUSION

Laparoscopic surgery and adherence to PPK does not correlate with good quality control or cost control. In contrast, laparotomy does not correlate with good cost control, but it does correlate with good quality control. The median disparity between the cost incurred by Cipto Mangunkusumo National Hospital and the reimbursement paid by BPJS was Rp 5,160,954. Percentage wise, BPJS reimbursed only 75.05% of the total costs incurred by Dr. Cipto Mangunkusumo General Hospital. The level of adherence based on services performed to the PPK guidelines in the study was 25.6%. A detailed financial evaluation that calculates the real unit cost is important to prevent a deficiency

in the funding; hence, it is crucial for a team to be set up in each department to manage the finances and discuss the matter directly with the P2JK Office (Health Insurance Financing Center) at the Ministry of Health. The level of adherence to the PPK guidelines was 25.6%, which has not been able to improve the evaluation of quality control and cost control, and as a consequence, it may be necessary to adjust and reformulate the existing PPK guidelines by incorporating the classification of endometriosis severity, allowing the quality control and cost control to be adjusted accordingly. Socialization of PPK guidelines must be carried out thoroughly to ensure that all healthcare professionals at Cipto Mangunkusumo National Hospital become familiar with the guidelines. More studies on INA-CBG's claim evaluation and financing in other fields and cases with a high prevalence are highly recommended to prevent further deficits in the hospital's finances.

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CONFLICT of INTERESTS

The author reports no conflicts of interest in this work.

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