The correlation of clinical pathway compliance implementation on clinical outcome and sectio caesarian patient costs in a type c private hospital in Lampung

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A B S T R A C T

Sectio caesaria births are around 17.6% of all births (Riskesdas, 2018), this figure is higher than the figure recommended by WHO. The high incidence and cost of sectio caesaria can cause problems if they are not managed properly. CA clinical pathway (CP) as a multi-disciplinary management plan for patients with certain diagnoses can be used to improve the quality and efficiency of excellent health services for each individual according to the law's mandate. This research is research (observational analytic) with a cross-sectional design and retrospective method for data collection. The data in this research were all BPJS patients who underwent sectio caesaria for the period of January 1st, 2020 - June 30th, 2020 according to the inclusion and exclusion criteria in a type C private hospital in Lampung Province. The observations were made on CP forms and patient medical record documents as well as details of treatment costs from BPJS claim data. To see the correlation of compliance implementation with CP and clinical outcomes, the Chi-square test was carried out, the average analysis of CP implementation compliance with costs was carried out using a non-parametric regression test, the correlation of confounding variables on clinical outcomes was tested using Chi-square and Somers tests, and the correlation between confounding variables and total real costs was tested using the ANOVA test. The descriptive analysis found that the average CP implementation compliance of 145 patients (63%) had an average good adherence score (≥85%) and 85 patients (37%) had low adherence (<85%). The points of care education and nutrition counseling as well as treatment or medical intervention have the highest score of 99.57% and the lowest is 0.34% in nursing mobilization/rehabilitation. The description of clinical outcomes of 230 patients with sectio caesaria Length of Stay (LOS) according to CP (≤3 days) as many as 95 patients and 185 patients with pain scale (VAS 2) and no patients had ILO. The results of the statistical analysis showed that there was no correlation of compliance implementation of CP on clinical outcomes based on the pain scale, LOS, and total real costs (p > 0.05). The result of the statistical analysis of the confounding variables Age (p 0.015) and treatment class (p 0.00) showed that there was a correlation on the total real costs (p <0.05). The conclusion of this research is that there is no correlation of compliance implementation with CP on clinical outcomes and the total real cost of sectio caesaria patients, and there is a correlation between age and class of care on the total real cost of sectio caesaria patients.

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A B S T R A K

Kelahiran sectio caesaria sekitar 17, 6% dari seluruh kelahiran (Riskesdas, 2018), angka ini lebih tinggi dari angka yang direkomendasikan WHO. Tingginya angka kejadian dan biaya sectio caesaria dapat menimbulkan permasalahan jika tidak dikelola dengan baik. Clinical pathway (CP) sebagai suatu rancangan penatalaksanaan multi disiplin untuk pasien dengan diagnosis tertentu dapat digunakan dalam upaya meningkatkan kualitas dan efisiensi pelayanan kesehatan yang prima kepada setiap individu sesuai amanat Undang Undang. Penelitian ini adalah penelitian (observasional analitik) dengan desain cross sectional dan metode retrospektif untuk pengambilan data. Data pada penelitian ini adalah seluruh pasien BPJS yang menjalani sectio caesaria periode 1 Januari 2020 - 30 Juni 2020 sesuai kriteria inklusi dan eksklusi di sebuah RS swasta tipe C di Provinsi Lampung. Pengamatan dilakukan pada form CP dan dokumen rekam medik pasien serta rincian biaya perawatan dari data klaim BPJS. Untuk melihat hubungan kepatuhan pelaksanaan CP terhadap outcome klinik dilakukan uji Chi square, analisis rata-rata kepatuhan pelaksanaan CP terhadap biaya dilakukan menggunakan uji regresi non parametrik, hubungan variable perancu terhadap outcome klinik diuji menggunakan uji Chi square dan somers serta hubungan variable perancu terhadap total biaya riil diuji menggunakan uji anova. Analisis deskriptif didapatkan, rata-rata kepatuhan pelaksanaan CP sebanyak 145 pasien (63%) memiliki nilai rata-rata kepatuhan baik (≥85%) dan 85 pasien (37%) untuk kepatuhan rendah (<85%). Poin asuhan edukasi dan konseling gizi serta tatalaksana atau intervensi medis memiliki nilai tertinggi sebesar 99,57% dan terendah sebesar 0,34% pada mobilisasi/rehabilitasi keperawatan. Deskripsi outcome klinik dari 230 pasien sectio caesaria Length of Stay (LOS) sesuai CP (≤3hari) sebanyak 95 pasien dan 185 pasien dengan skala nyeri (VAS 2) serta tidak didapati pasien yang mengalami ILO. Hasil analisis statistik menunjukkan tidak adanya hubungan kepatuhan pelaksanaan CP terhadap outcome klinik yang berdasarkan skala nyeri, LOS,dan total biaya riil (p > 0,05). Hasil analisis statistik variable perancu usia (p 0,015) dan kelas perawatan (p 0,00) menunjukan ada hubungan terhadap total biaya riil (p <0,05). Kesimpulan pada penelitian ini adalah tidak terdapat hubungan antara kepatuhan pelaksanaan CP terhadap outcome klinik dan total biaya riil pasien sectio cesaria, serta terdapat hubungan usia dan kelas perawatan terhadap total biaya riil pasien sectio caesaria.

INTRODUCTION

The rate of *sectio caesaria* is increasing significantly worldwide, and also nationally (Sungkar & Basrowi, 2020), recent evidence shows that most of the countries have *sectio caesaria* which is higher than the WHO recommendation rate, for example 40.5% in Latin America and Caribbean region, 32.3% in North America, 25% in Europe, and 19.2% in Asia. In Indonesia, it tends to be similar to the increase in the number of *sectio caesaria* from 2% in 1986 to 16% in 2012. Basic Health Research (Riskesdas) in 2018 recorded around 17.6% of all births via *sectio caesaria*, higher than the number recommended by WHO at the population level. The high number of *sectio caesaria* also contributes to state finances (Sungkar & Basrowi, 2020). In Indonesia, the total cost of *sectio caesaria* reaches USD 19.5 million per year (Haninditya et al., 2019).

Of the total budget allocation for the Ministry of Health in 2019 amounting to 71.12 trillion rupiahs, 35.91 trillion rupiahs or 50.49% were funds for Contribution Assistance Recipients (PBI) participants in the National Health Insurance (JKN) (including the large claim value for the financing of the *sectio caesaria* action, which is one of the largest claim

values nationally), which is included in the budget allocation for the Secretariat General (RI, 2020).

The effectiveness of using CP as a quality control tool is still being debated. However, the use of CP for several indicators in the United States reaches almost 80% of RS. Allegedly due to various biases in research that causes the results of studies on the effectiveness of CP to be inconsistent. Reducing the use of facilities, increasing clinical outcomes, quality of life index, clinical outcomes, economic outcomes, patient and clinical practitioner satisfaction, reducing treatment costs and Length of Stay (LOS), facilitating early discharge, and reducing unnecessary actions are examples of several studies which shows the effectiveness of using CP (Whittle, 2019)

The high number of SC deliveries and the large value of claims for SC procedures and not much research has been conducted, make it necessary to conduct evaluation research on the implementation of CP SCTP by looking at the existing level of adherence and the correlation of CP SCTP adherence on clinical outcomes (ILO, pain and also LOS) and real costs and the correlation of confounding variables on clinical outcomes and total real costs in several types of hospitals and several regions so that the research results are useful in

providing a strong picture of the implementation and adherence to the implementation of the clinical pathway and seeing its correlation with clinical outcomes and the total real costs as an information material in making policies related to the implementation of clinical pathways. This research aims to analyze the correlation of the level of compliance implementation of the *sectio caesaria* clinical pathway on clinical outcomes (pain intensity, length of stay, and the incidence of Surgical Wound Infection (ILO), and the total real costs and the correlation of confounding variables for clinical outcomes and the total real costs after the clinical pathway was implemented by previously categorizing compliance into compliant and non- compliant groups. This research was conducted at a type C private hospital that had implemented the *sectio caesaria* Clinical Pathway in Lampung Province, which had never been analyzed for the correlation of the level of compliance implementation of the Clinical Pathway on clinical outcomes and total real costs.

METHOD

This research is a research (observational analytic) with a cross-sectional design, the method for data collection is retrospective where the researcher used a search of hospital medical record documents and data on direct medical costs of inpatients who underwent a *sectio caesaria* at a type C private hospital in Lampung during the period 1st January 2020 to 30th June 2020. The subjects of this research were all mothers who gave birth with a *sectio caesaria* without complications in the period of 1st January 2020 to 30th June 2020 and were registered as BPJS members, as many as 230 patients. The sampling technique used in this research is the consecutive sampling technique. Exclusion criteria in this research were patients with incomplete medical records (including information on ILO events 30 days after surgery), patients discharged from the hospital at their own request (APS), patients who were referred to other hospitals and patients who died.

The descriptive analysis was carried out to get an overview of the patient's compliance implementation of CP data and average data on compliance implementation of 21 CP care points contained in the clinical pathway by assessing compliance at each point of care by looking at the CP form in the patient's medical record, if it is implemented then it will be given a value of 100 if it is not implemented, it is given a value of 0. Then the average value of compliance is calculated. The CP implementation compliance category will be grouped into two, namely low compliance (non-compliant) if the average value of compliance is <85% and good compliance category (compliant) if it has a value of ≥85%. To analyze the compliant variable to clinical outcome variables, the Chi-square test was used, while for the average variable of compliance on the total real cost variable, non-parametric regression tests and Chi-square tests were used, Somers were used for confounding variables on clinical outcomes, and lastly for confounding variables on the total real cost using the parametric ANOVA test.

RESEARCH RESULTS AND DISCUSSION

The total population based on inclusion and exclusion criteria in this study was 230 patients. From the descriptive analysis, it was found that the average adherence to CP implementation was 145 patients (63%) had a good compliance average score (≥85%) and 85 patients (37%) had a low compliance average score (<85%). According to the theory of the All Wales Fundamentals of Care Audit (fadilah & Budi, 2018), it is said that a compliance to standard of care is divided into 2 categories, namely low - moderate compliance if the percentage is 10% -84% and high compliance if the percentage is 85% - 100% (Green Compliance) according to Table I. The research conducted by Hanindita et al., 2019 showed that the average compliance with CP in *sectio caesaria* patients at a private hospital type C in Yogyakarta had compliance with a high category of 98%, while a research conducted by Astuti et al., showed that the average CP compliance in cases of *sectio caesaria* at Panembahan Senopati Hospital, Bantul was 28.12% or in the low category (Astuti et al., 2017).

Table 1. The Average Compliance Implementation of the *Sectio caesaria* Clinical Pathway for each patient and each point of care (n=230)

	Number of Patients	%
Clinical pathway compliance		
compliant	145	63,00
Non compliant	85	37, 00
Average Compliance of Each Care Point		
1. Discharge Planning	227	98,59
2. Integrated Education		
a. Education/Medical Information	226	98,12
b. Nutrition Education & Counseling	228	99,57
c. Nursing Education	225	97,94
d. Pharmacy Education	223	96,66
3 .Therapy/ Medikamentosa		
a. Infusion Liquid	227	98,70
b. Injection	220	96,09
c. Anesthesia	206	89,57
d. Oral Medication	219	95,65
e. Home Medicine	202	88,26
4. Management/Intervention		
a. Management / Medical Intervention	229	99,57
b. Nursing Management	212	92,39
c. Nutrition Management/Intervention	227	98,70
d. Pharmaceutical Management/ Intervention	4	1,74

5. Monitoring & Evaluation			
a. Doctor Dpjp		227	99,13
b. Nursing		226	98,59
c. nutrition		172	74,89
d. Pharmacy		220	95,65
6. Mobilization / Rehabilitation			
a. Medical		219	95,22
b. Nursing		1	0,43
c. Physiotherapy		201	87,39

Based on the results above (Table 1) it was found that the average compliance with the highest percentage was education and counseling care as well as management care or medical intervention, which was 99.57%, while the lowest compliance score was found in the point of nursing mobilization / rehabilitation care of 0.34 %. This is different from the research of Hanindita et al., where the results on the highest average compliance were at points of consultation and team communication at 99.44% and the lowest at points of psychosocial counseling care at 70.62% (Haindita et al., 2019).

Table 2 describes the clinical outcome descriptions of *sectio caesaria* patients (length of stay, ILO events and pain intensity) as well as confounding variables (age, parity and treatment class). The three clinical outcome parameters are an illustration of the quality of service quality from the hospital and also as a standard in determining the costs to be incurred and also in order to know the description of the 3 confounding variables which effect will be seen on clinical outcomes and total real costs. The results of the research show that the level of pain was highest in (VAS2) of 80.4%. The highest length of stay (LOS) was the length of stay > 3 days of 58.7%, different from research conducted by (Bai et al., 2018), (Lin et al., 2011), (Fadilah & Budi, 2018), (Rotter et al., 2010), and (Hanindita et al., 2019) the highest research results were 3 days of hospitalization of 88.58%.

There were no patients with surgical wound infections (ILO) found from observations of patient medical records on patient progress notes during treatment, during re-control and data on SSI incident reports in hospitals up to 30 days after surgery from 230 patients.

Table 2. The Description of the Clinical Outcome of *Sectio Caesaria* Patients

Variable	Category	N	%
1. Age	< 25 years old	34	14,8
	25 – 35 years old	162	70,4
	> 35 years old	34	14,8
2. Parity	Primigravida	54	23,5
	Multigravida	146	63,5
	Grande Multigravida	30	13,0
3. Class	1	43	18,7
	II	43	18,7
	III	144	62,6
Total		**230**	**100**

Table 3. The Description of Confounding Variables for *Sectio Caesaria* Patients

Variable	Category	N	%
1. Pain (VAS)	1 (VAS 1)	6	2,6
	2 (VAS 2)	185	80,4
	≥ 3 (VAS 3)	39	17,0
2. Long of Stay (LOS)	≤ 3 days	95	41,3
	>3 days	135	58,7
3. Surgical Wound Infection	ILO Not occurred	230	100
	ILO occurred	0	0
Total		**230**	**100**

The highest age in the research was the age range of 25-35 years old as many as 70.4% (healthy reproductive age). Age is one of the factors that affect maternal health during pregnancy and is closely related to health during pregnancy to delivery and postpartum (RI, 2010).

The most parity status in multigravida is 63.5%. Parity 2 or more has a higher risk of bleeding (Haindita et al., 2019). Of the 230 *sectio caesaria* patients, most of them underwent treatment in class 3 as many as 62.6% and were followed by class 1 and class 2 as many as 18.7%, in contrast to the research conducted by Rella in 2018 which stated that in type C hospitals the highest frequency of *sectio caesaria* cases was in class 2 of treatment class as many as 62% (Rella, 2018).

Table 4. The Correlation of Compliance Implementation of Clinical Pathways on Clinical Outcomes and Total Real Costs of *section caesaria* Patients (n=230)

	Variable	Compliant			Non-compliant			P- *Value*
		N	%		N	%		
1	Pain (VAS)							
	VAS 1	5	3,45		1	1,18		0,575
	VAS 2	116	80,00		69	81,18		
	VAS 3	24	16,55		15	17,64		
2	Long Of Stay (LOS)							
	≤ 3 days	63	43,55		32	37,65		0,388
	>3 days	82	37,65		53	62,35		
				Average			Average	
3	Total real cost	145	100	9.435.666,97	85	100	9.356.048,97	0,741

The analysis of the correlation of compliance implementation of CP on clinical outcomes of pain level (VAS) and length of stay (LOS) was analyzed using the Chi square test, and obtained p values of 0.575 and 0.388 (p> 0.05), these results indicate that statistically the compliance implementation of CP is not related to the VAS value and also the length of stay (LOS) as shown in Table 4.

The results above are different from the results of the research conducted by Haninditya et al., 2019 which showed that there was a correlation of compliance implementation of CP on the pain scale with a p value of 0.003

Setyorini et al., in his research stated that there was an increase in AVLOS before and after implementation or implementation of clinical pathways (Setyorini et al., 2019) different from the results of several research conducted by (Bai et al., 2018), (Lin et al. ., 2011), (Rotter et al., 2010), (Pahriyani, 2014) and (Hanindita et al., 2019) who said that there was a decrease in LOS after the enactment of CP.

Non-parametric regression test conducted to determine the correlation of the average compliance implementation of CP on total real costs has obtained a p value of 0.741 (p > 0.05). It is concluded that statistically there is no correlation between compliance implementation of CP and total real costs, different from the research conducted by (Bai et al., 2018), (Lin et al., 2011), (Pahriyani, 2014) and (Hanindita et al., 2019). and (Rahmawati et al., 2017) which shows that patient care costs, real costs (direct medical costs) decreased after CP was implemented.

Table 5. Clinical Outcome and Total Real Cost of *Sectio Caesaria* Patients Based on Age, Parity and Treatment Class (N=230)

Variable	LOS			VAS				Total Real Costs		
	≤ 3 days	> 3 days	P	VAS 1	VAS 2	VAS 3	P	N	Average	P
Age (years old)										
< 25	10	24		0	30	4		34	Rp. 8.556.848,00	
25 – 35	69	93	0,278	3	130	29	0,278	162	Rp. 9.619.568,00	0,015
> 35	16	18		3	25	6		35	Rp. 9.239.206,00	
Parity										
Primigravida	18	36		0	43	11		54	Rp. 9.125.010,00	
Multigravida	66	146	0,273	1	121	24	0,067	146	Rp. 9.552.713,00	0,335
GrandeMultigravida	11	19		5	24	4		30	Rp. 9.199.642,00	
Class										
I	14	29		1	32	10		43	Rp. 12.311.065,18	
II	20	23	0,386	2	30	11	0,076	43	Rp. 10.069.313,39	0,000
III	61	83		3	123	18		144	Rp. 8.340.831,00	

Table 5 shows the correlation of confounding variables and clinical outcomes tested using the Chi square and Somers tests as well as the correlation between confounding variables and real total costs tested using the ANOVA test. The results obtained showed that there was no correlation between the confounding variables (age, parity and class of care) and clinical outcomes (LOS and VAS) because they had a p value > 0.05 and only the confounding variables Age p 0.015 and class of care p 0.015 which had a correlation on total real costs with a p value (<0.05).

In this research, there had never been an evaluation or audit of CP in patients with previous *section caesaria*. An example of an instrument that can be used in a CP audit is the Integrated Care Pathways Appraisal Tools (ICPAT). This instrument has been validated to evaluate whether the CP made is good and correct, by fulfilling at least dimensions 1 and 2 of ICPAT (Whittle, 2009)

LIMITATION OF THE STUDY

The limitations of this research are that this research is only based on existing medically recorded data and does not make direct observations to ascertain whether the existing CP has been implemented properly and correctly, researchers cannot see directly the patient's physiological condition, and the differences in therapy provided by doctors

and other factors that can be taken into consideration, where these things might affect the patient's clinical outcome.

CONCLUSION

The conclusion in this research is that there is no correlation of compliance implementation of CP on clinical outcomes and the total real costs of *section caesaria* patients, and there is a correlation of age and class of care on the total real costs of *section caesaria* patients.

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