

THE EFFECT OF COMPLIANCE CLINICAL PATHWAY ON THE QUALITY-OF-SERVICE COST OF TREATMENT LENGTH OF STAY AT LINGGAJATI HOSPITAL

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Abstract

Clinical pathways are essential for achieving good clinical governance in hospitals as they standardize patient care. However, the compliance with the implementation of the inguinal hernia clinical pathway at Linggajati Hospital does not meet the minimum standard of 80%. Specifically, the service quality is below the desired 80%, treatment costs do not align with INA CBGs standards, and the length of stay exceeds the recommended ≤ 3 days. This study aims to analyze the effect of compliance with the implementation of the inguinal hernia clinical pathway on service quality, treatment costs and length of stay at Linggajati Hospital. This type of research is survey research. The population of this study was the medical records of inguinal hernia patients from January 2023 to June 2024. The sample in this study was 204 respondents taken using the purposive sampling technique. Univariate data analysis uses frequency distribution and the Three Box Method, and multivariate analysis uses multinomial regression and ordinary least squares (OLS) regression. Results: Compliance with the implementation of the inguinal hernia clinical pathway does not have an impact on the quality of service and cost of care but only has an impact on the length of stay at Linggajati Hospital with an R-square value of 0.039 and a P-value of 0.000. Conclusions: The results of this research have implications for providing information to health workers to further optimise clinical pathway compliance and monitor quality control evaluation and hospital care costs.

Keywords: Clinical Pathway, Service Quality, Length of Stay

1. INTRODUCTION

Clinical pathway is an important part of the document and tools in realising good clinical governance in hospitals. A clinical pathway is a planning concept given to patients based on evidence-based medical service standards and nursing care with measurable results within a certain period of time while in the hospital. A clinical pathway is a plan that is prepared in detail covering every important stage of health services for patients with a certain diagnosis (Wilson, 1997).

Clinical pathways play a role in improving quality control and cost control in hospitals, reducing length of stay, reducing the risk of readmission, complications, and patient death, and overall hospital costs. The results of research on the application of clinical pathways in several countries show that the application of clinical pathways can increase cost-effectiveness and reduce the length of hospital stay significantly (Dy, S. M., et al., 2003). The implementation of clinical pathways must be audited according to clinical practice guidelines, evaluating and reducing unwanted variations in the implementation of clinical practices. In general, in a hospital, only 30% of patients are treated with clinical pathways.

Clinical pathways can be used to predict the length of stay and the cost of health services needed so that the use of hospital resources can be optimised. The preparation of clinical pathways and calculation of the cost of cases that often occur are very necessary for controlling hospital quality and costs. Length of stay (LOS), or length of stay, indicates how many days a patient is hospitalised in one treatment period. Hospitalisation is a patient service for observation, diagnosis, treatment, medical rehabilitation, and/or other health service efforts by staying in the hospital.

The results of the survey at Lingayati Regional Hospital from 10 medical records of patients for compliance with the implementation of the inguinal hernia clinical pathway, including 6 compliant and 4 non-compliant. The quality of service is good; 6 and 4 are not good. The cost of treatment according to the claim process is 5, and 5 are not in accordance. The length of stay is in accordance with ≤ 3 days; there are 5 patients, and 5 patients are not in accordance. From the results of the survey, compliance with the implementation of the clinical pathway has not met the minimum standard of 80%, the quality of service is at least 80%, the cost of treatment has not met the INA CBGS standard for the class of care, and the standard for the length of stay has not met the standard of ≤ 3 days.

2. METHOD

This type of research is survey research conducted by taking several samples from a population and using a questionnaire as a data collection tool. The type of research uses hypothesis testing. The population of this study is the medical records of inguinal hernia patients from January 2023 to June 2024; there were 415 with a sample of 204 respondents. The results of the validity and reliability test with Cronbach's alpha of 0.799 indicate that the questionnaire questions can be relied on for data collection. Univariate data analysis with descriptive statistics and the Three Box Method, while for multivariate with Ordinary Least Square (OLS) Regression. Ethical permits for Linggajati Hospital were issued by the Esa Unggul University Code of Ethics Enforcement Board, Research Ethics Commission with the number 0924-08.064/DPKE-KEP/FINAL-EA/UEA/VIII/2024 on August 19, 2024.

3. RESULT AND DISCUSSION

**Table 1 Respondent Characteristics
Gender and Age**

Profile	Category	Frequency	Percentage
Gender	Male	148	74%
	Female	56	26%
	Total	204	100%
Age	21-35 years	13	6.4%
	36-50 years	34	16.7%
	51-70 years	157	76.9%
	Total	204	100%

Source: Research Results (2024)

Respondent characteristics based on gender: the majority of respondents, as many as 74% are male, only 26% of respondents are female. Based on the age of respondents 21-35 years as many as 6.4%, 36-50 years as many as 16.7% and 51-70 years as many as 76.9%.

Table 2. Compliance Implementation Clinical Pathway

Dimensions	Items	Statement	Compliance
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			Yes (1)	%	No (0)	%
Medical care	1	Initial Medical Assessment	204	100	0	0
	2	Medical Assessment	204	100	0	0
	3	Medical diagnosis	204	100	0	0
	4	Education/Medical Information	175	85.8	29	14.2
	5	Medical Management/Interventions	204	100	0	0
	6	Monitoring and Evaluation	152	74.5	52	25.5
	7	<i>Discharge Planning</i>	148	72.5	56	27.5
Average index of medical care dimensions			184	90.2	20	9.8

Nursing care	8	Initial Nursing Assessment	204	100	0	0
	9	Nursing Assessment	204	100	0	0
	10	Nursing Diagnosis	204	100	0	0
	11	Nursing Education	171	83.8	33	16.2
	12	Nursing Management/Interventions	204	100	0	0
	13	Monitoring and Evaluation	164	80.4	40	19.6
	14	<i>Discharge Planning</i>	156	76.5	48	23.5
Average index of dimensions of nursing care			187	91.7	17	8.3
Supporting Care: Laboratory, Radiology	15	Laboratory Examination	204	100	0	0
	16	Radiological Examination	204	100	0	0
	17	Monitoring and Evaluation	123	60.3	81	39.7
Average index of supporting care dimensions: laboratory, radiology			177	86.8	27	13.2
Pharmaceutical Care	18	Pharmacy Assessment	204	100	0	0
	19	Pharmacy Education	158	77.5	46	22.5
	20	Pharmaceutical Management Interventions	150	73.5	54	26.5
	21	Monitoring and Evaluation	154	75.5	50	24.5
Average index of dimensions of pharmaceutical care			167	81.9	37	18.1
Nutritional care	22	Nutrition Assessment	204	100	0	0
	23	Nutritional Diagnosis	204	100	0	0
	24	Nutrition Education/Counselling	125	61.3	79	38.7
	25	Management/Nutritional Intervention	138	67.6	66	32.4

	26	Monitoring and Evaluation	120	58.8	84	41.2
Average index of nutritional care dimensions			158	77.5	46	22.5
Average index of dimensions of compliance with clinical pathway implementation			175	85.8	29	14.2

Source: Research Results (2024)

The results of the descriptive analysis of the compliance variable of the implementation of clinical pathways obtained the average value of the compliance dimension of the implementation of clinical pathways for compliance. Yes, there were 175 respondents (85.8%), and no, there were 29 respondents (14.2%), where the average value of the medical care dimension of compliance Yes, there were 184 respondents (90.2%), and no, there were 20 respondents (9.8%). the average value of the nursing care dimension of compliance Yes, there were 187 respondents (91.7%), and no, there were 17 respondents (8.3%). the average value of the supporting care dimension of laboratory and radiology compliance Yes, there were 177 respondents (86.8%), and no, there were 27 respondents (13.2%). the average value of the pharmaceutical care dimension of compliance Yes, there were 167 respondents (81.9%), and no, there were 37 respondents (18.1%), and the average value of the nutritional care dimension of compliance Yes, there were 158 respondents (77.5%), and no, there were 46 respondents (22.5%).

Table 3 Quality of Service

Table 5: Quality of Service									
Dimensions	Items	Statement	Likert Scale				Amount	Index	Category
			1	2	3	4			
Reliability	1	The hospital building looks clean	0	20	151	33	204	156.25	High
			0	40	453	132	625		
	2	The hospital has a quite comfortable waiting room	0	6	171	27	204	158.25	High
			0	12	513	108	633		
	3	Complete tools available	0	19	161	24	214	154.25	High
			0	38	483	96	617		
	4	Have clear signage	0	50	118	36	204	149.5	Medium
			0	100	354	144	598		
	Average index of reliability dimensions								154.56
Evidence	5	Medical personnel provide thorough, careful, and timely services as promised	0	40	147	17	204	147.25	Medium
			0	80	441	68	589		
	6	Medical personnel and other officers help if there are patient problems	0	38	153	13	204	146.75	Medium
			0	76	459	52	587		
	7	The nurse tells you how to care for yourself and how to take medication	0	2	173	29	204	159.75	High
			0	4	519	116	639		
	8	Medical personnel provide information to patients before services are provided	0	40	147	17	204	147.25	Medium
			0	80	441	68	589		

	9	The medical personnel explained the actions taken	0	38	153	13	204		
			0	76	459	52	587	146.75	Medium
Average index of evidence dimensions								149.55	Medium
Responsiveness	10	Medical personnel are willing to accept patient complaints	0	39	151	14	204		
			0	78	453	56	587	146.75	Medium
	11	Responsive nurses serve patients	0	16	167	21	204	154.25	High
			0	32	501	84	617		
	12	Medical personnel accept and serve well	0	40	147	17	204	147.25	Medium
			0	80	441	68	589		
	13	Medical personnel did it correctly and quickly	0	38	153	13	204	146.75	Medium
			0	76	459	52	587		
Average index of responsiveness dimensions								148.75	Medium
Assurance	14	Doctors have the ability and knowledge to diagnose diseases quite well.	0	29	142	33	204		
			0	58	426	132	616	154	High
	15	Medical personnel provide complete medicines and medical equipment	0	40	147	17	204		
			0	80	441	68	589	147.25	Medium
	16	Doctors serve in a reassuring manner so that patients feel safe	0	38	153	13	204		
			0	76	459	52	587	146.75	Medium
	17	Medical personnel have the patient's medical records	0	2	173	29	204	159.75	High
			0	4	519	116	639		
Average index of assurance dimensions								151.93	Medium
Empathy	18	Doctors provide sufficient service time to patients	0	6	171	27	204		High
			0	12	513	108	633	158.25	
	19	Nurses provide services according to the wishes and understanding of the patient's needs	0	29	142	33	204		High
			0	58	426	132	616	154	
	20	Nurses serious of attention to patients	0	50	118	36	204		
			0	100	354	144	598	149.5	Medium
	21	The doctor listens to complaints about your illness	0	38	153	13	204		
			0	76	459	52	587	146.75	Medium

	22	Nurses, when serving, are polite and friendly	0	40	147	17	204	147.25	Medium
			0	80	441	68	589		
Average index of empathy dimensions								151.2	Medium
Average index of service quality dimensions								151.12	Medium

Source: Research Results (2024)

The results of the descriptive analysis of service quality variables using the three box method analysis obtained an average value of the service quality dimension of 151.12 and included in the medium category, where the average index value for the reliability dimension is included in the high category, namely 154.56, the average index value for the evidence dimension is included in the medium category, namely 149.55, the average index value for the responsiveness dimension is included in the medium category, namely 148.75, the average index value for the assurance dimension is included in the medium category, namely 151.93 and the average index value for the empathy dimension is included in the medium category, namely 151.

TABLE 4 COST OF TREATMENT

Dimensions	Items	Statement	Cost		Difference	
			Hospital	BPJS	Positive	Negative
Maintenance costs	1	Financing during patient care at a fixed-cost hospital	IDR 726,287,160	IDR 1,137,054,223	-	IDR 73,424,377
	2	Financing during patient care in variable cost hospitals	IDR 484,191,440			
			IDR 1,210,478,600	IDR 1,137,054,223		IDR 73,424,377

Source: Research Results (2024)

The results of the descriptive analysis of the variable cost of care obtained a value for financing during patient care at the fixed cost hospital of IDR 726,287,160 and a variable cost of IDR 484,191,440 with a total cost of care of IDR 1,210,478,600 and a BPJS claim process of IDR 1,137,054,223. There is a negative difference in care costs of IDR 73,424,377.

Table 5 Length of Stay

Dimensions	Items	Statement	Amount	%	Result
Length of Stay	1	≤ 3 days	154	75.5	Suitable CP
	2	4-6 days	47	23.0	No suitable CP
	3	≥ 7 days	3	1.5	No suitable CP

Source: Research Results (2024)

The results of the descriptive analysis of the variable length of stay showed that the length of stay was ≤ 3 days for 154 respondents (75.5%), 4-6 days for 47 respondents (23%) and ≥ 7 days for 3 respondents (1.5%).

Table 6 The Impact of Compliance with the Implementation of the Inguinal Hernia Clinical Pathway on Service Quality, Treatment Costs, and Length of Stay

Variable	<i>R Square</i>	<i>P-value</i>	N
Compliance with the implementation of the inguinal hernia clinical pathway towards service quality	0,000	0.770	204
Compliance with the implementation of the inguinal hernia clinical pathway towards treatment costs	0.005	0.307	204
Compliance with the implementation of the inguinal hernia clinical pathway on length of stay	0.039	0,000	204

Source: Research Results (2024)

The results of the ordinary least square linear regression test on compliance with the implementation of the inguinal hernia clinical pathway did not affect the quality of service with a p-value of 0.770 and the cost of care with a p-value of 0.307 but only affected the length of stay with a p-value of 0.000.

DISCUSSION

The Influence of Compliance with the Implementation of the Inguinal Hernia Clinical Pathway on the Quality of Service

This study shows that there is no effect of compliance with the implementation of the inguinal hernia clinical pathway on the quality of service. The compliance value of the implementation of the clinical pathway is in accordance with the standard, and the quality of service is included in the moderate category. This means that the quality of service at Linggajati Regional Hospital has been felt by patients treated in the hospital. The quality of service for hospital facilities and infrastructure has met the needs of patients in the hospital, but for the item of clear signs, it needs to be completed again. The quality of service for evidence has not met the expectations or desires of patients being treated, for the item medical personnel provide careful and timely services according to what was promised, medical personnel and other officers help if there are patient problems, medical personnel provide information to patients before the service is provided, and medical personnel explain the actions taken need to be improved again. The quality of service for responsiveness has not met the expectations or desires of patients being treated, for the item medical personnel are willing to accept patient complaints, medical personnel accept and serve well, medical personnel do it correctly and quickly, and there is a time contract provided to receive complaints or consultations from patients.

The quality of service for BPJS-related guarantees has met patient expectations during hospitalisation, but for the medical staff item, providing complete medicines and medical devices and doctors serving with a convincing attitude so that patients feel safe needs to be improved again. The quality of service for empathy has met patient expectations during hospitalisation, but for the nurse item paying close attention to patients, doctors listening to complaints about your illness, and nurses in serving being polite and friendly, it needs to be improved again.

Clinical pathways are guidelines designed to improve the quality of health care by reducing variation in medical practice and ensuring efficient and effective care. The implementation of clinical pathways for inguinal hernia, a common medical condition requiring surgical intervention, plays an important role in improving the quality of health care by ensuring that standards of care are met (Rafli, 2023).

Service quality is a variable that is very closely related to patient satisfaction. Several studies even reveal that the better the quality of service, the higher the level of patient satisfaction. Basically, the activity of providing services in hospitals is a form of service that cannot be seen,

cannot be smelt, and cannot be touched, so the aspect of physical form becomes important as a measure of service (Layli, 2022).

Many hospitals have started implementing Integrated Clinical Pathway (ICP) because of its advantages. First, ICP is an efficient multidisciplinary documentation format, avoiding duplication of writing and potential miscommunication within the health team. Second, ICP improves the knowledge and competence of the multidisciplinary team when communicating with patients. Third, ICP has standardised outcomes according to the length of stay so that cost-effective care is achieved. Fourth, ICP improves patient satisfaction through clearer discharge planning implementation, which in turn improves the quality of care (Jayanti & Hariyati, 2020).

Overall, compliance with the implementation of the inguinal hernia clinical pathway is very important in improving the quality of health care. Through evidence-based standardization of care, better operational efficiency, increased patient satisfaction, and support for quality improvement efforts, the clinical pathway can provide benefits to patients, medical personnel, and hospitals. Therefore, it is important for all parties involved in inguinal hernia care to understand and comply with this guideline in order to achieve optimal outcomes in health care. This shows that there are still many other factors, such as personal interactions between medical staff and patients, availability of facilities, and administrative processes, that also determine the quality of service.

The Effect of Compliance with the Implementation of the Inguinal Hernia Clinical Pathway on Treatment Costs

This study shows that there is no effect of compliance with the implementation of the inguinal hernia clinical pathway on the cost of treatment. The compliance value of the implementation of the clinical pathway is in accordance with the standard, and the cost of treatment is not in accordance with the BPJS claim. There is a negative difference in the cost of treatment. The negative difference occurs because the patient who is being treated is upgraded, but the BPJS claim process remains in accordance with the previous class, so there is a negative difference in the cost of treatment. There are several costs, such as examination costs and treatment related to the patient's condition due to hypertension and diabetes mellitus. There is still the provision of drugs outside the national formulary and the purchase of drugs outside the Linggajati Hospital pharmacy.

Clinical pathways are guidelines designed to provide efficient and effective standards of care for patients with specific medical conditions. The implementation of clinical pathways is expected to improve the quality of care, reduce variability in clinical practice, and reduce the cost of care. The implementation of clinical pathways aims to reduce this variability by providing clear and structured guidance for the diagnosis, management, and treatment of patients. Adherence to clinical pathways is expected to result in more consistent and efficient care, which in turn can reduce the cost of care (Langitan, A. (2019).

A common problem is the difference between the real cost and the INA-CBGs package rate. Some are actually lower or even vice versa. This difference causes hospitals to bear financial risk. One thing that hospitals can do to overcome this is to carry out cross-subsidies (Agiwahyunto, F., Widianawati, E., Wulan, W. R., Putri, R. B., & Article, I. (2020)..A common problem is the difference between the real cost and the INA-CBGs package rate. Some are actually lower or even vice versa. This difference causes hospitals to bear financial risk. One thing that hospitals can do to overcome this is to carry out cross-subsidies Simangunsong, A. (2017)..

Implementation of clinical pathways helps in optimizing the use of resources, both medical personnel and medical equipment. With clear guidelines, the use of drugs, medical devices, and other interventions can be managed more efficiently, avoiding waste.⁴ Adherence to clinical pathways also contributes to improved quality of care. Patients who receive care based on CP tend to have better outcomes, meaning fewer complications and costly re-treatments.¹⁰ Compliance with the implementation of the inguinal hernia clinical pathway has been shown to reduce the cost of care through standardization of care, reduction of hospitalization duration, optimization of resources, and improvement of quality of care. Therefore, it is important for health facilities to

encourage and ensure compliance with the clinical pathway to achieve maximum benefits in inguinal hernia care. With an emphasis on benefits, costs, and quality of care, it is expected to improve the effectiveness and efficiency of health services. This shows that factors that can cause increased costs that cannot be controlled only through clinical pathway compliance are not enough to address unexpected costs that arise during care, such as complications, the need for additional procedures, or unplanned use of drugs.

The Effect of Compliance with the Implementation of the Inguinal Hernia Clinical Pathway on the Length of Days of Rehabilitation

This study shows that there is an effect of compliance with the implementation of the inguinal hernia clinical pathway on the length of stay. The compliance value of the implementation of the clinical pathway is in accordance with the standard, and the length of stay is in accordance with the clinical pathway. The length of stay of patients at Linggajati Hospital is calculated from the date of discharge minus the date of admission. The principles of lateral inguinal hernia management are conservative and operative. Surgical techniques in adult patients consist of hernia repair with mesh and non-mesh, both performed openly and laparoscopically (Sayuti, et al., 2023). Several studies have shown the advantages of laparoscopic herniotomy, including smaller incision wounds, shorter hospitalization times, and lower costs compared to open herniotomy (Odo, Darmajaya & Golden, 2022)

Compliance with the implementation of the inguinal hernia clinical pathway carried out by each PPA (Professional Care Provider), namely doctors, nurses, midwives, pharmacists, nutritionists and supporting health workers (analysts and radiographers) has an impact on shortening the length of stay for patients after surgery. The results of a study conducted at Linggajati Hospital showed that compliance with the implementation of the inguinal hernia clinical pathway had an impact on the length of stay, but did not have an impact on the quality of service and cost of care. The study found that the implementation of the clinical pathway could reduce the length of stay for patients in the hospital. This is in line with the findings stating that a well-implemented clinical pathway can reduce the length of stay (LOS) and directly affect the reduction in treatment costs (Odo, Darmajaya & Golden, 2022)

Adherence to the implementation of the inguinal hernia clinical pathway has a significant impact on the length of stay of patients. By ensuring standardized, efficient, and well-coordinated care, clinical pathways help reduce practice variation, manage complications effectively, and improve the overall quality of care. Data from various hospitals show that although clinical pathways do not have a direct impact on the quality of care and costs of care, good implementation of clinical pathways can significantly reduce the length of stay of patients. Thus, adherence to clinical pathways not only benefits patients in terms of faster recovery but also benefits hospitals in terms of operational efficiency and better use of resources (Hochman, et al., 2000).

Adherence to the clinical pathway means that all steps listed in the guidelines are followed carefully by the medical team. This includes adherence to the diagnosis, surgical procedures, and follow-up care. This adherence is important to ensure that patients receive consistent, quality care that meets established standards. Adherence to the clinical pathway ensures that each patient receives standardized care. This standardized process reduces variation in care, which is often the main cause of unpredictable length of stay. By following the clinical pathway, each patient receives the same diagnosis, procedure, and care, which has been proven to be effective and efficient (Anas, 2019)

Adherence to clinical pathways reduces unnecessary variation in clinical practice. Variation in clinical practice can often lead to suboptimal care and prolong the length of stay. By following a clinical pathway, all patients are treated in the same way based on the best available evidence (Meo, 2015).

Implementation of clinical pathways requires good communication and coordination between members of the medical team. This effective communication ensures that each member of the medical team understands their roles and responsibilities and can work together efficiently

to provide optimal care. This good coordination can reduce waiting times and speed up the patient's recovery process (Yuditio, et al., 2024).

The right quantity and quality of human resources in the hospital will support the implementation of clinical pathways, such as the availability of health workers whose education levels are not the same, allowing for differences in knowledge, perceptions, and even motivation in implementing clinical pathways. This can certainly be controlled by the role of management, which can provide education, capacity building, or similar training to motivate the implementation of clinical pathways. After that, management can also go directly to review and evaluate the implementation of clinical pathways.

4. CONCLUSION

This study highlights the importance of compliance with the clinical pathway for inguinal hernia in enhancing hospital care. While compliance with the pathway did not significantly affect service quality or treatment costs, it was found to have a notable impact on reducing the length of stay. The findings suggest that while the implementation of clinical pathways can improve operational efficiency by shortening hospitalization duration, further attention is needed to improve the alignment of care with established quality standards and cost regulations. To optimize outcomes, it is crucial for healthcare professionals to enhance adherence to clinical pathways, particularly focusing on improving service quality and managing treatment costs in accordance with industry standards. Future research should explore additional factors that may influence the effectiveness of clinical pathways and examine their potential in improving both patient outcomes and cost-efficiency across various medical conditions.

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