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THE IMPLEMENTATION OF ACUTE APPENDICITIS CLINICAL PATHWAY TOWARD AVERAGE LENGTH OF STAY

Al Razi Sena
Department of Health Services and Information, Vocational Schools, Universitas Gadjah Mada Yogyakarta, 555281, Indonesia
alrazi98@mail.ugm.ac.id

Sri Setiyarini
Department of Basic Nursing and Emergencies, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada Yogyakarta, 555281, Indonesia
sri_setiyarini@ugm.ac.id

Abstract

Acute appendicitis is a gastrointestinal disease that the incidence of it was increased in Indonesia from 566132 people in 2009 became 621435 in 2010. Cases of acute appendicitis were continued to increase every year at Condong Catur Hospital. A clinical pathway ideally suited to the management of common surgical conditions with well-defined outcomes, such as appendicitis. Implementation of the clinical pathway as a clinical guidance needed to be measured to find out the impact on the outcome of the patient. This study aims to find out a significant impact of acute appendicitis clinical pathway toward the average length of stay. This study used a cross-sectional design, carried out at Condong Catur Hospital. Data were collected from the medical records of patients, both before (52 medical records) and after (50 medical records) the clinical pathway was implemented. Frequency distribution result was performed using a descriptive statistics. The chi-square test was performed to find out the significant difference between variables. This study noted the majority of acute

appendicitis patient occurred at 15-24 years old and male sex. Majority of the medical records of patient is without clinical pathway. Most of the medical records with clinical pathway are incomplete in filling on psychosocial counseling, education and communication with patient and family, and discharge planning. The mean of average length decrease from 3.52 days become 2.36 days. There is significant difference between the implementation of clinical pathway toward AvLOS with p-value = 0.000. There is a significant relationship between the implementation of clinical pathway appendicitis acute toward reduced of AvLOS. The hospital need to maintain the compliance in the filling of clinical pathway among physicians through regular monitoring or socialization.

Keywords

Clinical Pathway, Acute Appendicitis, Average Length of Stay

1. Introduction

Health services need to be planned well and precisely to produce a high quality, effective and efficient clinical treatment. The clinical pathway is the main appliance for quality and cost control, especially in cases that have the potential to consume large resources. The clinical pathway represent a form of clinical guideline as an appropriate tools to control the quality management, cost, variations, patient statisfaction (Rotter et al., 2008), and provide the detail care steps of patient with specific case (Almond et al., 2008). Variation of care as a crucial problem in the health services system, because it would be increasing the medical error and provide the imprecise treatment that delivers to consume large cost, health care system must reduce it without reducing the quality treatment of patients (Panella, 2003). The clinical pathway implementation has become an appropriate approach to these concern (Willis et al., 2000).

The clinical pathway approach has been implemented in many health care institutions in several specific cases. Most of the study that was published revealed that the implementation of clinical pathway shown the positive impact on health outcomes, but some studies also suggest that the utilization of clinical pathway by health profession is low that implementation strategies for linking evidence with clinical practice often to be weak or ineffective (Kinsman, James, & Ham, 2004). The length of stay as one of the indicators of patient outcomes to measure the variations, effectiveness, and efficiency of clinical pathways (Molloy, Martin, Moschetti, & Jevsevar, 2017), often being a problem when the clinical pathway was implemented under low compliance (Rotter et al., 2010). The clinical prognosis without or with clinical pathways under low compliance would increase the variations in

assessment, diversity on medical treatment, and medication. All of these problems will lead to high cost, differences in patient outcomes, and the exceed day length of stay.

The guidance of best procedures and timing to treat patients with the specific case according to evidence-based medicine at the structured and local level, can be provided by clinical pathway (Panella, 2003). The clinical pathway effectively shortens the waiting time between division in the same unit/organization/department and upgrade the coherence due to the explicit interpretation of the communication among the disparate department. Another advantage of the clinical pathways was significantly reduced the process cost through standardization by avoiding employee waiting times, underutilization and duplication of equipment (Schrijvers, Hoorn, & Huiskes, 2012). The concept of the clinical pathway wasn't from one field, but it was developed by a multi-professional field or teams, consist of all types of physicians, social workers, nurses, administration, and who have the responsibility to manage the patient treatment. As guidance, the clinical pathway provides a detail step, the satisfaction of employees as job descriptions and responsibilities derived from the work process becomes clearer and increases (Schrijvers et al., 2012). A clinical pathway suits for all cases that need a systematic step on treatment, ideally suited to the management of common surgical conditions with well-defined outcomes, such as appendicitis (Almond et al., 2008).

Acute appendicitis and appendectomy is one of the most common disease and procedure worldwide. The incidence of acute appendicitis is quite high in Indonesia, seen from the increasing number of appendicitis sufferers every year. Based on data released by the Indonesian Ministry of Health in 2009, the incidence of Appendicitis was 596132 (3.36%) and increased in 2010 become 621435 people (3.53%). Appendicitis is the second highest non-communicable disease in Indonesia during hospitalization in 2009 and 2010 (Arifuddin, Salmawati, & Prasetyo, 2017). In addition, the number of acute appendicitis in-patient was raised frequently every year at the Condong Catur Hospital. Based on preliminary studies conducted by researchers at Condong Catur Hospital, a clinical pathway was formed on September 2018, socialized on November 2018, and legally implemented on January 2019. There are 5 clinical pathways that was made as guidance, specifically dengue fever, typhoid fever, acute appendicitis, non-hemorrhage strokes, and tuberculosis.

The clinical pathway was developed by a team from the quality improvement and patient safety committee, sub-field clinical pathway and clinical practice guidelines. The reasons for making clinical pathway were different, non-hemorrhage stroke due to high cost, typhoid fever, dengue fever and tuberculosis based on high length of stay, whereas clinical pathway of acute appendicitis based on high

risk and high volume. According to the interviews with the clinical pathway-making team, the normal average length of stay of acute appendicitis patients at Condong Catur Hospital around 2-3 days, but in practice exceed day the length of stay often found, such as 4 or 5 days of treatment before the clinical pathway was implemented. To identify the impact of clinical pathway, measurement of it was needed. This study was conducted to prove the impact of the clinical pathway implementation toward the length of stay as one of the patient outcomes in acute appendicitis case, by compare the length of stay before and after the clinical pathway was implemented.

2. Methods

2.1. Study Population

This study used a cross-sectional design, carried out at Condong Catur Hospital; the clinical pathway has been implemented on January 2019 at that place. Data were collected from the medical records of patients, both before (52 medical records) and after (50 medical records) the clinical pathway was implemented. The diagnose of acute appendicitis that was recorded in the medical record must be a single case or no additional diagnoses/secondary diagnose as eligible criteria of sample in this study. Samples were taken by using the consecutive sampling technique. We have observed the sheets of the clinical pathway and discharge summary of acute appendicitis patients to collect data the length of stay and compliance in the filling, started from October 2018 until March 2019.

2.1. Instrument

An observation checklist was used to collect the data. A professor expert in basic nursing and emergency department and 2 lecturer expert in health services and information were reviewed the content of this instrument. The clinical pathway making-team at Condong Catur Hospital validates the content to make sure the data item used legally allowed. The instrument consist two main section; discharge summary and clinical pathway documentation.

Discharge summary section consist of medical record number, name of patient, sex, type of insurance, referral origin, outcomes, inpatient class, admission time & date, discharge time & date, and doctor name in charge. Clinical pathway documentation section consist of 17 part; patient registration, assessment and monitoring, nursing assessment and monitoring, proponent examination (ECG, Hematology check, etc.), medical treatment, nursing treatment, medication, nutrition, patient activities, team consultation and communication, psychosocial counseling, education and communication with

patient and family, discharge planning, other services provided, diagnose and ICD 10 code, medical surgery and ICD 9CM code, and authentication.

2.2. Data Analysis

We compared the medical record data of patient before and after the clinical pathway was implemented. Frequency distribution result was performed using a descriptive statistic to provide mean, percentage, and frequency of the samples. The chi-square test was performed to find out the significant difference between the implementation of clinical pathway toward length of stay, and considered p-value <0.05 to decide the significance. The chi-square test suitable for answering question about difference or association between categorical variables (Franke, Ho, & Christie, 2012).

3. Results

3.1. Characteristics of Acute Appendicitis Patients

Table 1 infer that acute appendicitis often occurs at the age of 15-24 years, as many as 28 patients (53.8%) before the implementation of clinical pathway and 34 patients (68.0%) after implementation of clinical pathway. The results of this study showed that the frequency of acute appendicitis tend to decrease after 15-24 years age group, both before and after the implementation of clinical pathway. The majority of acute appendicitis occurred in men, both before and after the implementation of clinical pathway, 37 patients (71.2%) before implementation of clinical pathway and 36 patients (72.0%) after clinical pathway.

Table 1: *Characteristics of Acute Appendicitis Patients Age Group and Sex (n = 102)*

No	Variables	Frequency Distribution					
		Before Clinical Pathway			After Clinical Pathway		
		f	%	Mean	f	%	Mean
1.	Age						
	a. 5-14	5	9.6	26.63	0	0.0	25.02
	b. 15-24	28	53.8		34	68.0	
	c. 25-34	8	15.4		13	26.0	
	d. 35-44	6	11.5		2	4.0	
	e. 45-54	2	3.8		0	0.0	
	f. 55-64	2	3.8		1	2.0	
	g. 65-74	1	1.9		0	0.0	
	h. >75	0	0.0		0	0.0	
2.	Sex						
	a. Male	37	71.2		36	72.0	
	b. Female	15	28.8		14	28.0	

3.2. Data Descriptions of Clinical Pathway Implementation

Most of samples were medical record without the clinical pathway as many as 52 medical records. In the other hand, this study obtained data as many as 50 files have a clinical pathway, the majority of medical records with clinical pathways was included in the 81% -100% category as many as 26 files (25.5%), and the others were under 80% in filling (Figure 1).

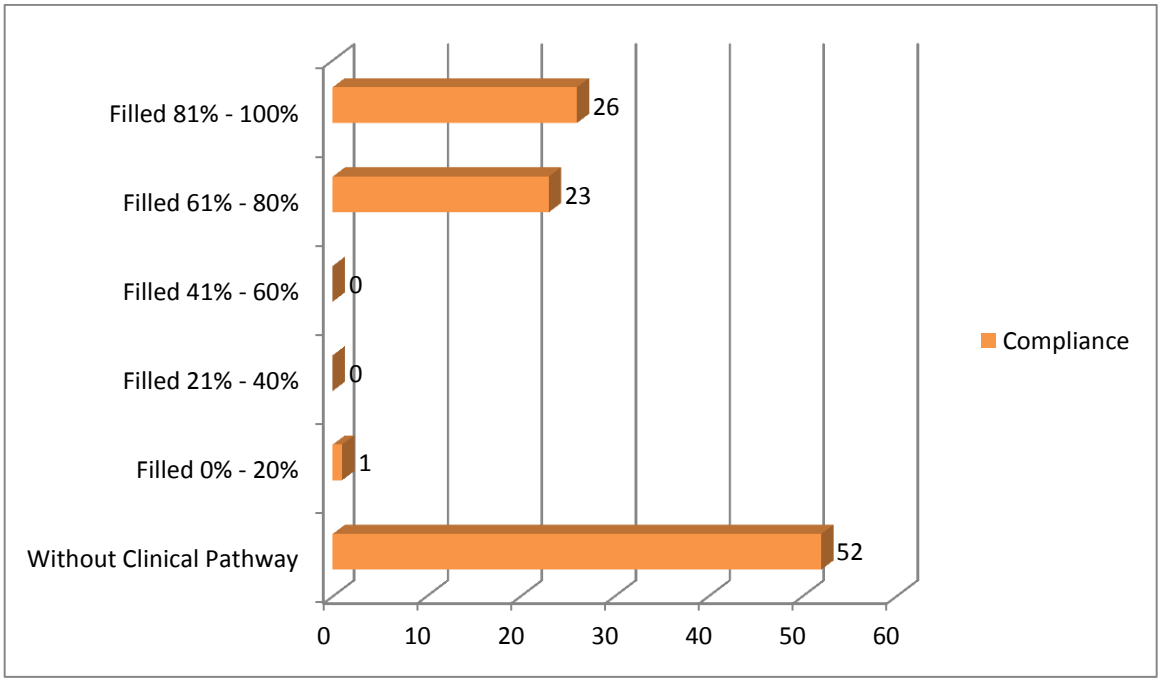

Figure 1: *Description of Acute Appendicitis Clinical Pathway Implementation*

From 50 medical records with clinical pathway, we observed each part and measure the compliance in filling of clinical pathway. The medical record with clinical pathway was found incomplete commonly in the part of psychosocial counseling (24.0%), education and communication with patient and family (22.0%), and discharge planning (20.0%) (Table 2).

Table 2: *Compliance of Clinical Pathway Implementation (n = 50)*

Part of Clinical Pathway	Compliance (n=50)			
	Complete		Incomplete	
	f	%	f	%
Patient registration	50	100.0	0	0.0
Assessment and monitoring	50	100.0	0	0.0
Nursing assessment and monitoring	49	98.0	1	2.0
Proponent examination	50	100.0	0	0.0
Medical treatment	49	98.0	1	2.0
Nursing treatment	48	96.0	2	4.0
Medication	49	98.0	1	2.0
Nutrition	48	96.0	2	4.0

Patient activities	49	98.0	1	2.0
Team consultation and communication	49	98.0	1	2.0
Psychosocial counselling	38	76.0	12	24.0
Education and communication with patient and family	39	78.0	11	22.0
Discharge planning	40	80.0	10	20.0
Other services provided	48	96.0	2	4.0
Diagnose and ICD 10 code	50	100.0	0	0.0
Medical surgery and ICD 9 CM code	50	100.0	0	0.0
Authentication	49	98.0	1	2.0

3.3. The Relationship of Clinical Pathway Implementation toward AvLOS

Data of average length of stay before and after implementation was compared to find out the significant difference used chi-square test. The majority of patients have exceed than 3 days (> 3 days) (53.8%) average length of stay before the implementation of the clinical pathways, whereas after the clinical pathway was implemented all of the patients (100%) stay for short – equal 3 days (≤ 3 days) (Table 3). The results of this analysis, indicate that there is a decrease in the frequency of >3 days length of stay of patients. It can be interpreted that the implementation of the clinical pathway can reduce the length of stay. This statement supported by the decrease means of an average length of stay, which from 3.52 days before implementation became 2.36 days after implementation of the clinical pathway. The chi-square test also revealed p_value = 0.000, which is the p value < α (0.05). It has mean there were a significant difference between the implementation of acute appendicitis clinical pathway toward the length of stay.

Table 3: *Clinical Pathway Implementation toward AvLOS (n = 102)*

Clinical Pathway Implementation	**AvLOS**					**p_value**
	≤ 3 day		**> 3 day**		**Mean**	
	f	**Exp. Count**	**f**	**Exp. Count**		
Before	24	37.7	28	14.3	3.52	0.000
After	50	36.3	0	13.7	2.36	

4. Discussion

This study was revealed that most of acute appendicitis cases occurred at 15-24 age group both before and after clinical pathway was implemented (Table 1). Acute appendicitis most likely occurred at the 20-30 years of human life because acute appendicitis is rare and the diagnosis of acute appendicitis in children is quite difficult, children less communicative to conveying the abdominal pain that their feel (Thomas, Lahunduitan, & Tangkilisan, 2016). The peak incidence of appendicitis is in the second or third decade of human life (Gearhart & Silen, 2013), people at that age can be

categorized as a productive period of human, where people at that age did many activities, often to ignore the food nutrition that their consume so bowel obstruction hard to avoid. Difficulty of defecating leads an increase in the intestinal cavity, and blockage the appendix duct (Pasaribu, 2010). The pathogenesis of acute appendicitis involves the obstruction of the lumen as a impact of fecaliths, the etiology of luminal obstruction varies with respect to patient age, while magnification of regional lymph nodes owing to infection might be the dominant cause for people at < 40 years old (Wei, Chen, Keller, & Lin, 2012).

According the gender differences, acute appendicitis cases most occurred among male, before as many as 37 patients (71.2%) and 36 patients (72.0%) after implementation of the clinical pathway (Table 1). This result similar with Lee, Park, & Choi (2010) study in South Korea, mentioned that the incidence of acute appendicitis commonly occur among males over females, where 23.58 per 10000 population/year for male and 21.81 per 10000 population/year for female in South Korea. The incidence of appendicitis was found higher in male over women because anatomical changes of male put them in risk of inflammation (Ahmad, Ali, Ali, & Anjum, 2010). Male also spend more time outside, like for work, sport, any duties and lead them to more likely consume fast food, which can increase the risk of complications and obstruction in the intestine that lead the emergence of problems in the digestive system, and one of them is appendicitis (Indri, Karim, & Elita, 2014).

The implementation of the clinical pathway begins in the early of January 2019. The medical record without clinical pathways is the files of patients that seeking treatment from October 2018 to December 2018, because at that range period the application of clinical pathway not implemented yet, because it was in the preparation stage for implementation. The medical record with clinical pathways generally was included in the 81% -100% category and followed by 61% -80%. The incomplete clinical pathways basically were the medical records of the patient on January (under 80%), because most of physician and nurse unadapt to records all of medical prognosis and information through clinical pathway approach, there were incomplete parts of clinical pathway in filling (Figure 1), particularly in the part of psychosocial counseling, education and communication with patient and family, and discharge planning (Table 2). Most of that items basically collected by the nurse and doctor.

The nurse was missed to record what they did to the patient into a clinical pathway, especially something that wasn't clinical treatment, such as counseling and education. They though that items would not lead a big problem when it was incomplete in filling. In particularly, doctors also forget to

take a note about discharge planning into clinical pathway sheet, even though what the patient had to do after discharged was explained by doctors in verbally. Doctors and nurses were key actors of the clinical pathway approach must discipline in compliance of filling, because this approach emphasizes the parallel step of patient treatment. The incomplete in filling would make communication among different health worker/physicians bias and disconnected, it will lead to increasing a risk of medical error because miscommunication among doctors and nurses (Schrijvers et al., 2012). Clinical pathways are perhaps difficult to implement because physicians may be concerned that the clinical pathway approach will reduce their autonomy. Leadership, regulation, and support is needed to make the compliance of clinical pathway implementation in all of department or physicians success (He, Bundorf, Gu, Zhou, & Xue, 2015).

Although the implementation of the clinical pathway not good enough on January, but it quite better after the first month it was implemented (February and March). Doctor, nurse, registration, and all of unit that responsible of patient getting to used it properly. Most of clinical pathway was filled over than 80%, average length of stay of patient also getting better. As we can see from the average length of stay after the clinical pathway was implemented (Table 3). Regarding of average length of stay, this study was exposed the frequency of exceeding than 3 days (> 3 days) length of stay was reduced so clear (Table 3). Previous study conducted by Zhu, Li, Li, Feng, & Gao (2014) mentioned the similarity that there a tangible reduction in total of length of stay between the clinical pathway group and the non-clinical pathway group (8.3 versus 12.3 days). As this study has been mentioned, the mean of length of stay was reduced also from 3.52 day became to 2.36 day (Table 3), and also represent a significant difference between the implementation of clinical pathway toward the average length of stay (p_value = 0.00) (Table 3).

According to the results, we can indicate that the implementation of the clinical pathway has a good impact on the average length of stay. The implementation of the clinical pathway provides a standardized step of care for the patient and ensures the health care was given to patient high quality. Irrational of drug used and overutilization of equipment significantly was reduced to limit the variety of treatment and outcome of the patient (Zhu et al., 2014). Previous study that involving 11398 participants and 20 studies compared stand-alone clinical pathways with usual care, show that length of stay from several diseases decrease significantly after the clinical pathway implementation (Rotter et al., 2010). The application of clinical pathways in hospitals reduce the length of stay, mortality by

8.8% (Reid et al., 2016), reduce the number of medical complications, improve the documentation process, and reduce the cost of treatment (Rotter et al., 2010).

5. Conclusion

Most of acute appendicitis patients were at that age 15-24 years and male. Implementation of clinical pathway significantly decrease the average length of stay of acute appendicitis patient (p=0.000) from 3.52 days became 2.36 days after clinical pathway was implemented. The clinical pathway provides the systematic and standardized step of care that would produce the limitation of treatment and outcome variety, especially on length of stay. Overall, the compliance of clinical pathway implementation good enough in filling so supports the aim of clinical pathway as guidance in communication among physicians/department.

6. Recommendations

The hospital need to maintain the compliance in the filling of clinical pathway among physicians through regular monitoring or socialization. Even though the implementation of clinical pathway seem like produce the good impact, however the incomplete clinical pathway would increase medical error because of miscommunication among physicians/department.

This study does not analyze the impact of clinical pathway implementation toward the cost of treatment/hospital and did not use statistical tests to find out the association between compliance in filling toward the average length of stay. Perhaps, further study can be carried out that to produce the detail and significant impact of clinical pathway implementation through cost and compliance.

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