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ANALYSIS OF THE INFLUENCE OF CLINICAL PATHWAY IN HOSPITALS ON LENGTH OF STAY: A SCOPING REVIEW

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Abstract: *Clinical pathway is a management tool used in healthcare to coordinate patient care efficiently, thereby reducing the length of stay required by patients in hospitals. The purpose of this study was to determine the effect of Clinical Pathway in hospitals on Length of Stay. This study was a scoping review using the PRISMA diagram. Article search was conducted based on the eligibility criteria of the PICO Model: P: Hospital Patients, I: Clinical Pathway, C: -, O: Length of Stay. The articles used were from 4 databases, namely: Google Scholar, Research Gate, PubMed, and Elsevier. With keywords including "Clinical pathway" AND "Length of Stay" AND "hospital". The implementation of clinical pathway is one of the strategies that can be used to reduce patient length of stay. Clinical pathway can help improve efficiency, quality, and compliance with healthcare standards. Based on the results of the study, the researchers recommend that effective socialization and training be conducted to improve the understanding and compliance of healthcare professionals with clinical pathway, develop clinical pathway based on strong scientific evidence, and conduct periodic monitoring and evaluation to ensure the effectiveness and suitability of the clinical pathway implemented.*

Keywords: *Clinical Pathway, Length of Stay, Hospital*

INTRODUCTION

A hospital is an institution that provides health services to the community. The goal is to facilitate public access to health services, protect the safety of patients, the community, the hospital environment, and human resources in hospitals, as well as improve the quality and maintain hospital service standards. (Hadira, syahrul, and Rachmawaty 2020) Hospitals are required to follow accreditation, both nationally and internationally, to improve safety and quality of service. The quality of service in hospitals can be assessed using the *Length of Stay* (LOS) indicator. (Hadira et al. 2020)

Length of stay (LOS) is the length of time a patient is hospitalized, measured from the time the patient arrives to the time he is given treatment and discharged. LOS is not only used to measure the length of treatment in the emergency room (IGD), but can also be used to measure the length of treatment in the inpatient room. (Delinda, Halimuddin, and Nurhidayah 2021) LOS is influenced by several factors, one of which is the health workers who treat patients. Health workers who have different skills will affect performance in handling cases, so as to extend LOS. Nurses are health workers who have a long intensity of time in interacting with patients, so they play an important role in determining LOS. Nursing care management in which there is a nursing process can be developed in the *patient care pathway* or better known as *the clinical pathway*. (Hadira et al. 2020)

The application of *clinical pathways* can be one way to achieve hospital accreditation goals. (Lia Dwi Jayanti and Rr. Tutik Sri Hariyati 2020) *A clinical pathway* is a comprehensive, standardized treatment plan for patients with specific clinical conditions or procedures. *The clinical pathway* is based on strong scientific evidence and aims to improve the quality and efficiency of health services, as well as patient safety. (Pahriyani, Andayani, and I 2014) *Clinical pathway* is an important document used to improve the quality and efficiency of health services in hospitals. Clinical pathway is one of the requirements for hospital accreditation in Indonesia. (Perwitasari, Handayani Gurning, and Aryani Perwitasari 2021) *A clinical pathway* that is developed in a coordinated and systematic manner, and is well evaluated, will provide significant benefits to the hospital. (Wardhana, Rahayu, and Triguno 2019)

This study intends to conduct a literature review to assess broadly whether *clinical pathway* can influence *outcomes* or outcomes measured by *Length of stay* (LOS). Through this review researchers will present generally available evidence in a substantive and concise manner, to provide a framework for hospitals to consider the effectiveness of *clinical pathways*.

MATERIALS AND METHODS

The purpose of this study was to determine the effect of clinical pathway in hospitals on length of stay. Researchers will use the scoping review research method. Scoping review is a type of literature review that aims to provide an overview of a research topic. Scoping review does not aim to analyze or conclude research results, but rather to identify and categorize existing evidence. Thus, this study uses a structured research approach to analyze and compile the results of several studies on the effect of clinical pathway in hospitals on length of stay.

This study uses previous journals as the main data in its search will be selected with the PICO creteria model. The search for data sources in this study came from several full-text sources published in several databases such as Google Scholar, Research Gate, PubMed, and Elsevier with keywords including "clinical pathway" AND "length of stay" AND "hospital" using PRISMA flow charts. The articles taken are articles published in the last 6 years (2017-2023).

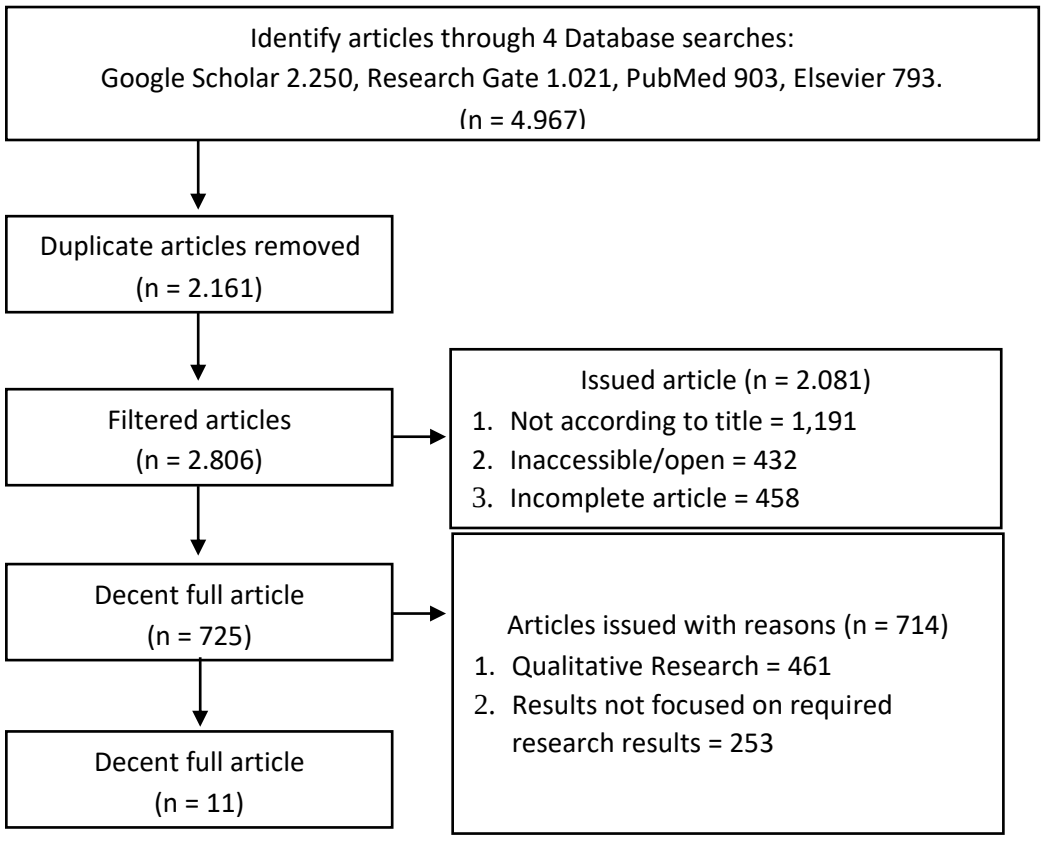

Figure 1. PRISMA Method Aliar Diagram of Article Search and Selection

RESULTS AND DISCUSSION

After going through the screening process, six articles that are relevant to the research objectives were identified. The following are the results of the review of each journal based on PICO.

Table 1. Description of the Primary Study of Included Articles

No.	Researchers	Sample	P	I	C	Or
1	Amioka dkk. (2022)(Amioka et al. 2022)	258	Hospital Patients	*Clinical Pathway*	-	*Length of Stay*
2	Armiyanti dkk. (2021)(Armiyanti 2021)	16	Hospital Patients	*Clinical Pathway*	-	*Length of Stay*
3	Bai dkk. (2018)(Bai et al. 2018)	54	Hospital Patients	*Clinical Pathway*	-	*Length of Stay*
4	Fadilah & Bob (2017)(Fadilah and Budi 2018)	146	Hospital Patients	*Clinical Pathway*	-	*Length of Stay*
5	Gurning > Perwitasari (2021)(Perwitasari et al. 2021)	74	Hospital Patients	*Clinical Pathway*	-	*Length of Stay*
6	Kosasih (2021)(Kosasih 2021)	304	Hospital Patients	*Clinical Pathway*	-	*Length of Stay*
7	Ogdon dkk. (2022)(Tracey L, Rohit S, and Jamie S. 2022)	48	Hospital Patients	*Clinical Pathway*	-	*Length of Stay*
8	Purnamasari dkk. (2023)(B, Pinzon, and Adisasmita 2023)	651	Hospital Patients	*Clinical Pathway*	-	*Length of Stay*
9	Rezkiki dkk. (2017)(Rezkiki 2018)	48	Hospital Patients	*Clinical Pathway*	-	*Length of Stay*
10	Safrini dkk. (2023)(Safrini, Laksmitawati, and Ramadaniati 2023)	159	Hospital Patients	*Clinical Pathway*	-	*Length of Stay*
11	Zacha dkk. (2023)(Zacha et al. 2023)	1553	Hospital Patients	*Clinical Pathway*	-	*Length of Stay*

Table 2. Results of Scoping Review Conducted

No.	Researchers	Research Sites	Speakers	*Outcome*	Research Results	*P-Value*
1	Amioka dkk. (2022)(Amioka et al. 2022)	Hospitals in Japan	*Clinical Pathway*	*Length of Stay*	*The Clinical Pathway* significantly reduces the *length of a* patient 's stay without increasing the mortality rate in hospital and also reduces the risk of patient readmission in the medium and long term.	0.001
2	Armiyanti dkk. (2021)(Armiyanti 2021)	RSUD Sungai Dareh	*Clinical Pathway*	*Length of Stay*	The results of this study are expected to be input for the hospital to be able to apply nursing care systematically through clinical pathway to type 2 Diabetes Mellitus patients to improve service quality.	0.000
3	Bai dkk. (2018)(Bai et al. 2018)	Hospitals in China	*Clinical Pathway*	*Length of Stay*	Conditions in Chinese hospitals show that adherence to the national *Clinical Pathway* reduces length of stay (LOS) and inpatient medical costs.	0.000
4	Fadilah & Budi (2017)(Fadilah and Budi 2018)	Yogyakarta City Hospital	*Clinical Pathway*	*Length of Stay*	The implementation *of clinical pathways* can reduce the *average length of stay*, but has not been able to prove any difference in patient outcomes.	0.016
5	Gurning & Perwitasari (2021)(Perwitasari et al. 2021)	Sele Be Solu Hospital, Sorong City	*Clinical Pathway*	*Length of Stay*	The implementation of *clinical pathway* at Sele Be Solu Hospital can add a fee of IDR 8,304,453 / day for every additional one day *Length Of Stay*.	0.868
6	Kosasih (2021)(Kosasih 2021)	Goenawan Partowidigdo Pulmonary Hospital	*Clinical Pathway*	*Length of Stay*	The application *of the Clinical Pathway* can reduce the length of hospitalization (LOS) and the average total hospitalization of patients hospitalized due to COPD exacerbations. This CP should be further evaluated to reduce re-admissions.	0.000
7	Ogdon dkk. (2022)(Tracey L et al. 2022)	Hospitals in the United States	*Clinical Pathway*	*Length of Stay*	The use of the *Clinical Pathway* increases the time to start enteral intake and decreases the length of hospitalization.	0.650
8	Purnamasari dkk. (2023)(B et al. 2023)	Rumah Sakit di Indonesia	*Clinical Pathway*	*Length of Stay*	The implementation *of the Clinical Pathway* in the three research hospitals significantly reduced the length of hospitalization.	0.351
9	Rezkiki dkk. (2017)(Rezkiki 2018)	RS. Dr. Achmad Mochtar (RSAM) Bukittinggi	*Clinical Pathway*	*Length of Stay*	The results showed that there was a significant effect on the average length of days of care for non-hemorrhagic stroke patients who were given the *nursing clinical pathway* with those who were not given intervention.	0.001
10	Safrini dkk. (2023)(Safrini et al. 2023)	Private Hospital X Bogor City	*Clinical Pathway*	*Length of Stay*	The implementation of *clinical pathway* at X hospital in Bogor City has shortened the treatment period and improved adherence to antibiotic selection in accordance with guidelines.	0.001
11	Zacha dkk. (2023)(Zacha et al. 2023)	Hospitals in Switzerland	*Clinical Pathway*	*Length of Stay*	It found that the groups that applied the *Clinical Pathway* differed in the time of hospitalization, the type of procedure, and the percentage ratio of costs incurred to income generated.	0.001
				Maximum *P-Value*		**0.868**
				Minimal *P-Value*		**0.000**
				Average		**0.171**

Based on all the results of the study, it can be concluded that the implementation of the *Clinical Pathway* can affect the *Length of Stay* in the hospital. *A clinical pathway* is a comprehensive, standardized treatment plan for patients with specific clinical conditions or procedures. *Clinical pathways* can help medical teams to provide consistent and efficient care, thereby reducing the *length of stay*.

Amioka et al. (2022) examined the application of the *clinical pathway* at Mitoyo General Hospital which aims to encourage early discharge of patients. The results showed that the length of stay of patients in the Clinical Pathway group *was significantly shorter than patients in the group before the implementation of the* Clinical Pathway ($p < 0.001$). So it can be said that the application *of the Clinical Pathway is an independent negative factor that contributes to* the length of stay in patients *, even significantly* the Clinical Pathway decreases the proportion of patients who are readmitted to the

hospital for the same disease within 6 months (p = 0.009). So in the study it can be said that the *Clinical Pathway* significantly reduces the *length of patient stay* without increasing mortality in the hospital and also reduces the risk of readmission in the medium and long term. (Amioka et al. 2022)

Armiyanti dkk. (2021) stated that an assessment of the quality of service and nursing care needs to be carried out in order to find out the extent of the quality of hospital services. One of the measurements of hospital service quality is determined by the length of the day of treatment. An alternative to nursing care management to improve nursing care and can be used as a control tool *is the Clinical pathway* which is one of the disease management tools that can reduce unnecessary service variations, improve clinical *outcomes*, and also resource efficiency. The purpose of this study was to analyze the effect of the application of *clinical pathway* on the length of days of treatment at Sungai Dareh Hospital. The results showed that there was a significant difference between those carried out by clinical *pathway* and those not carried out *by clinical pathway* where *a p-value of < 0.05* was obtained, which is 0.000. (Armiyanti 2021)

Bai dkk. (2018) tries to determine *the impact of clinical pathway on medical care in Chinese hospitals, including the perceived impact of* clinical pathway on medical care and objectively measured patient outcomes. The results showed that the national *clinical pathway* implemented by hospitals in China was able to reduce the *length of stay* and inpatient medical costs. (Bai et al. 2018) Fadilah & Budi (2017) explained that *clinical pathway* can be used as quality and cost control in health services, one of which can be seen from the *average length of stay* and *outcomes*. The implementation of clinical pathways that have been implemented needs to be measured for effectiveness in reducing the average length of treatment and producing *better outcomes*. The purpose of this study was to measure the difference in *average length of stay* and *patient outcomes* between before and after the implementation of *clinical pathway* at RSUD Kota Yogyakarta. The results showed that the implementation of *clinical pathway* can reduce *the average length of stay*.(Fadilah and Budi 2018)

Gurning & Perwitasari (2021) Explain that varied medical services can cause different *outcomes* that can affect the cost of treatment and the length of patient stay, so it is necessary to implement *a clinical pathway* because it can minimize treatment costs and reduce the length of patient stay in the hospital. The purpose of this study was to analyze the suitability of the application of clinical pathway *and the cost-effectiveness of implementing* clinical pathway at RSUD Sele Be Solu Sorong City. The results of the study found that the application *of clinical pathway* at Sele Be Solu Hospital can reduce the *length of stay of* patients.(Perwitasari et al. 2021)

Kosasih (2021) tried to observe the application of *Clinical Pathways (*CP) and evaluate its effectiveness in its management at Goenawan Partowidigdo Lung Hospital (RSPG) Cisarua Bogor. From the results of his research, it is known that there are differences in clinical outcomes before and after the application of clinical *pathway*. The overall *mean length of stay* (LOS) difference using *the clinical pathway is 4 days while those who do not use* the clinical pathway are 6 days. So it can be concluded that the application of *clinical pathway* can reduce the length of hospitalization and the average total hospitalization of patients.(Kosasih 2021)

Ogdon et al. (2022) explained that the use of clinical pathways in various sets of treatments has been shown to reduce practice variability and overall length of hospitalization without increasing the rate of side effects. His research found that the implementation of *the clinical pathway* independently was associated with a decrease in first enteral admission, length of hospital stay, and length of ICU stay. No side effects were associated with the use of this pathway, including death, reintubation rates, AKI, increased bleeding from the chest tube, or readmission.(Tracey L et al. 2022)

Purnamasari et al. (2023) *clinical pathway* is a medical service standard that requires the guarantee of quality health services at a rational cost. This study aimed to measure the implications of *clinical pathway* on length of hospitalization. This research was conducted in government and

private hospitals type A and B with uniformity of services and clinical *pathway* format. The results showed *that the clinical pathway significantly reduced the risk of length of stay compared to patients treated without a* clinical pathway .(B et al. 2023)

Rezkiki et al. (2017) explained that the length of days of treatment is an indicator of the quality of service and nursing care in measuring the level of hospital efficiency. The cause of the high number of days of care is nursing care management or nursing *clinical pathway*. The results showed that there was a significant effect on the average length of days of care of patients who were given the *nursing clinical pathway* with those who were not given the intervention.(Rezkiki 2018)

Safrini et al. (2023) conducted a study aimed at determining the implementation of *clinical pathway* in the inpatient room of Private X Hospital in Bogor. Based on the results of statistical tests, patients who applied the clinical pathway *had a lower length of hospitalization when compared to patients before the application of* the clinical pathway .(Safrini et al. 2023) Zacha et al. (2023) conducted a study that aimed to compare the quality of the perioperative period before and after the implementation of the adopted interdisciplinary protocol with organizational conditions. The pre- and post-clinical *pathway groups* differed in the time of hospitalization, the type of procedure, and the percentage ratio of costs incurred to income generated.(Zacha et al. 2023)

Discussion

Clinical Pathway

Clinical pathway is a standard of medical services that requires the guarantee of quality health services at a rational cost. The clinical pathway details the steps that need to be taken in providing health services to patients, from diagnosis, treatment, to discharge. The application of clinical pathway can not only be applied to inpatients, but also to pediatric polypediatric patients, stroke, heart, diabetes, etc. Where in the articles above, it is known that clinical pathway is not only useful in reducing the length of hospitalization, but also reducing the risk of side effects of treatment, revisits due to the same disease recurrence, service effectiveness, and also patient satisfaction.

The factors that affect the clinical pathway in reducing the length of patient stay consist of:

1. Improved service efficiency: Clinical pathways can help reduce practice variation and improve healthcare efficiency. This can be done by ensuring that all patients receive the same care, in accordance with established standards.
2. Improved quality of care: Clinical pathways can help improve the quality of healthcare by ensuring that all patients receive appropriate and safe care.
3. Increased compliance with standards: Clinical pathways can help improve compliance with health care standards. This can be done by setting standards that are clear and easy to understand by all health workers.

Length of Stay (LOS)

Length of stay is a term used to describe the number of days spent by a patient in a hospital. LOS can be used as an indicator of health care quality, hospital efficiency, and health care costs. Prolonged LOS can have a negative impact on patients, hospitals, and the health care system as a whole. Patients who stay in the hospital longer can develop complications, increase the risk of death, and increase health care costs. Hospitals that have high LOS can experience increased operating costs and decreased revenue. The health care system as a whole can experience increased costs and decreased efficiency.

Based on each article used, factors that can affect LOS can be formulated, including:

1. Patient characteristics: Factors such as age, sex, diagnosis, and health condition of the patient can affect LOS.
2. Quality of service: Quality healthcare can help speed up patient recovery and reduce LOS.

3. Hospital efficiency: the level of efficiency of management determination in running a hospital can reduce LOS by reducing practice variation and increasing productivity.
4. Health care costs: Longer LOS can increase health care costs.

Clinical pathway Terhadap Length of Stay

A clinical pathway is a management tool used in the healthcare field to efficiently coordinate patient care. Based on the results of research in reference journals, the implementation of clinical pathway can reduce LOS on average by 10-17%. However, the effectiveness of clinical pathways in reducing LOS can vary depending on several factors, such as the patient's condition, disease severity, and quality of clinical pathway implementation. Clinical pathways are used to describe the steps a health care team must take in treating a patient with a specific diagnosis or condition. One of the benefits of a good clinical pathway is being able to present clear and standardized guidelines in patient care. By following these guidelines, the health care team can ensure that patients get treatment that matches their diagnosis or condition. This reduces the likelihood of unnecessary procedures occurring, which can prolong the LOS.

Another benefit and influence of clinical pathway is as an instrument for monitoring and evaluating patient development. This routine patient monitoring process allows the care team to identify necessary changes in care, so that care can be adjusted quickly. This can avoid prolongation of LOS caused by complications that are not detected early. The team's clinical pathway will combine the roles of various health care team members, such as doctors, nurses, physical therapists, and nutritionists. Good coordination between these team members can help minimize delays in treatment and help patients be discharged from the hospital faster.

The clinical pathway also includes the education of patients and their families. By providing patients and their families with the right information about their condition, the care provided, and the plan after discharge, patients can be better prepared to manage their own condition after discharge. This can reduce LOS as patients become more independent. Good use of clinical pathways can help optimize patient care, prevent unnecessary complications, and thus, reduce the patient's Length of Stay (LOS) in the hospital.

CONCLUSION

The application of clinical pathway is one strategy that can be used to reduce the length of patient hospitalization. Clinical pathways can help improve efficiency, quality, and compliance with health care standards. Based on the results of the literature study conducted, here are some recommendations to improve the effectiveness of clinical pathway implementation, namely effective socialization and training need to be carried out to improve the understanding and compliance of health workers with clinical pathways. Clinical pathways need to continue to be developed based on the latest scientific evidence. Regular monitoring and evaluation needs to be done to ensure that the clinical pathway applied is effective and in accordance with needs.

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