



IMPLEMENTATION OF THE CLINICAL PATHWAY PARADIGM IN ACHIEVING COST-EFFECTIVENESS IN HEALTH FINANCING (SYSTEMATIC LITERATURE REVIEW)

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Abstract

Background: Clinical Pathway (CPW) is a clinical documentation technique that focuses on clinical practice standards for nurses, physicians, and others. The clinical pathway is a two-way instruction for handling patients on clinical problems, diagnosis, and stages of care. Any intervention given and the development of the patient is documented systematically based on the time criteria set and expected to increase the service quality and lower hospital expenses. This paper aimed to measure the CP role in increasing hospital expenses efficiency.

Methods: A systematic literature review was conducted to determine the effectiveness and efficiency of using clinical pathways for financing. The inclusion criteria were all types of research from descriptive to Randomized Controlled Trials containing at least 2 methods of comparison of interventions published in the last 30 years.

Results: This review found 129 articles related to the relationship between clinical pathway use and the effectiveness of financing in hospitals. After going through the screening process based on the inclusion and exclusion criteria, it was found that only 15 articles met the requirements. After analyzing the data, the use of Clinical Pathway in managing patients can lower hospital expenses.

Conclusion: Implementing a clinical pathway for patients' management in hospitals can increase hospital expenses efficiency.

Keywords: Cost-effectiveness; Cost-efficiency; Clinical Pathway; Finance; Health Care

1. INTRODUCTION

We are in an age of change, so that it's not a new problem in health care. It happens rapidly and involves such a broad range of activities that builds chance and challenge. Hospitals are requested to reach results considered impossible 5 years ago in this turbulent and uncertain time in healthcare. Even though, financial resources and human resources have dwindled. Healthcare, hospitals, and clinics are now grappling with the issue of capping costs and providing patients with the most cost-effective quality health care. Although the technology of medicine has advanced, there is an inherent problem that needs to be addressed. The deficiency of a formal care planning system often clues to:¹⁻³

- Negligence errors that make the main stages in the treatment process forgotten or not followed up;
- A team approach should not be used, which results in poor discharge planning and a lack of patient education.

Technological improvements have a series of problems that come with them. The procedure may be more expensive; inefficiencies can increase the length of stay, thereby increasing waiting lists. There is also a

disappointment to patients and families patients who are not aware of the medical treatment plan. Health workers also stated sadness over the unintentional discharge.

The challenge in this modern era is how to maximize treatment costs with maximum results, especially regarding financing at the Healthcare and Social Security Agency (BPJS). This paper aims to examine the potential of clinical pathways in achieving cost-effectiveness

2. RESEARCH METHOD

Research Design and Search Strategy

This systematic literature review is based on international protocols and guidelines established by PRISMA and AMSTAR. A comprehensive literature search was conducted on various competent and reputable medical databases such as GOOGLE SCHOLAR, EMBASE, Science Citation Index Expanded, MEDLINE, and Cochrane Central Register of Controlled Trials (CENTRAL). The search strategy or keywords used had a basic pattern, namely [((CLINICAL PATHWAY) AND (COST) AND ((EFFECTIVENESS) OR (EFFICACY)))] with various adjustments to each existing database.^{4,5}

Time and Place

This study was carried out by searching for various literature on related themes from September 19, 2021, to September 22, 2021. The selected literature was limited to references for the last 30 years, from September 1991 to September 2021. This study was continued by reviewing journals obtained by 2 reviewers to assess bias in each study.

Research Inclusion and Exclusion Criteria

The criteria of inclusion in this study were (1) all studies were cross-sectional, cohorts, clinical trials, quasi-experiments, and Randomized Controlled Trials; (2) reporting at least a comparison between the 2 existing interventions or the efficacy of the Clinical Pathway; (3) research publications in the last 20 years, namely the period from 2001 to 2021. In addition to the 3 inclusion criteria, various studies had to be excluded from this systematic literature review if the study: (1) the research results were unclear, biased, and inappropriate for extrapolation with data contained in the study; (2) unfinished research, only in the form of a protocol, or unavailability of a full manuscript on the research (only in a resume or abstract form); (3) research written not in English or Indonesian; (4) double publication.

Interpretation and Data Extraction

The interpretation of all literature sources was carried out by two authors (YF and HS) who would independently assess the bias and feasibility of each literature source to be used as data from the literature review. The assessed bias included standard biases by selecting bias, performance bias, detection, attrition bias, reporting bias and vested interest. All domains of bias to be assessed were included in the standardized category with a classification of low, uncertain, and high risk.

3. RESULTS

This study included 129 scientific manuscripts at the beginning of the study. After going through various screening processes in accordance with the inclusion and exclusion criteria that have been set, the results obtained were 15 scientific manuscripts that met the requirements and were suitable for use in the systematic literature review method (Figure 1).

2 researchers reviewed all journals, and the results showed that there were 13 (86.7) studies that have proven the effectiveness of clinical pathways usage for financing in hospitals. The effectiveness and efficiency in hospital financing played a close role in various factors such as length of stay, financing of medical services, use of drugs, diagnostic

instruments, rehabilitation, administration, and support (Table 1).

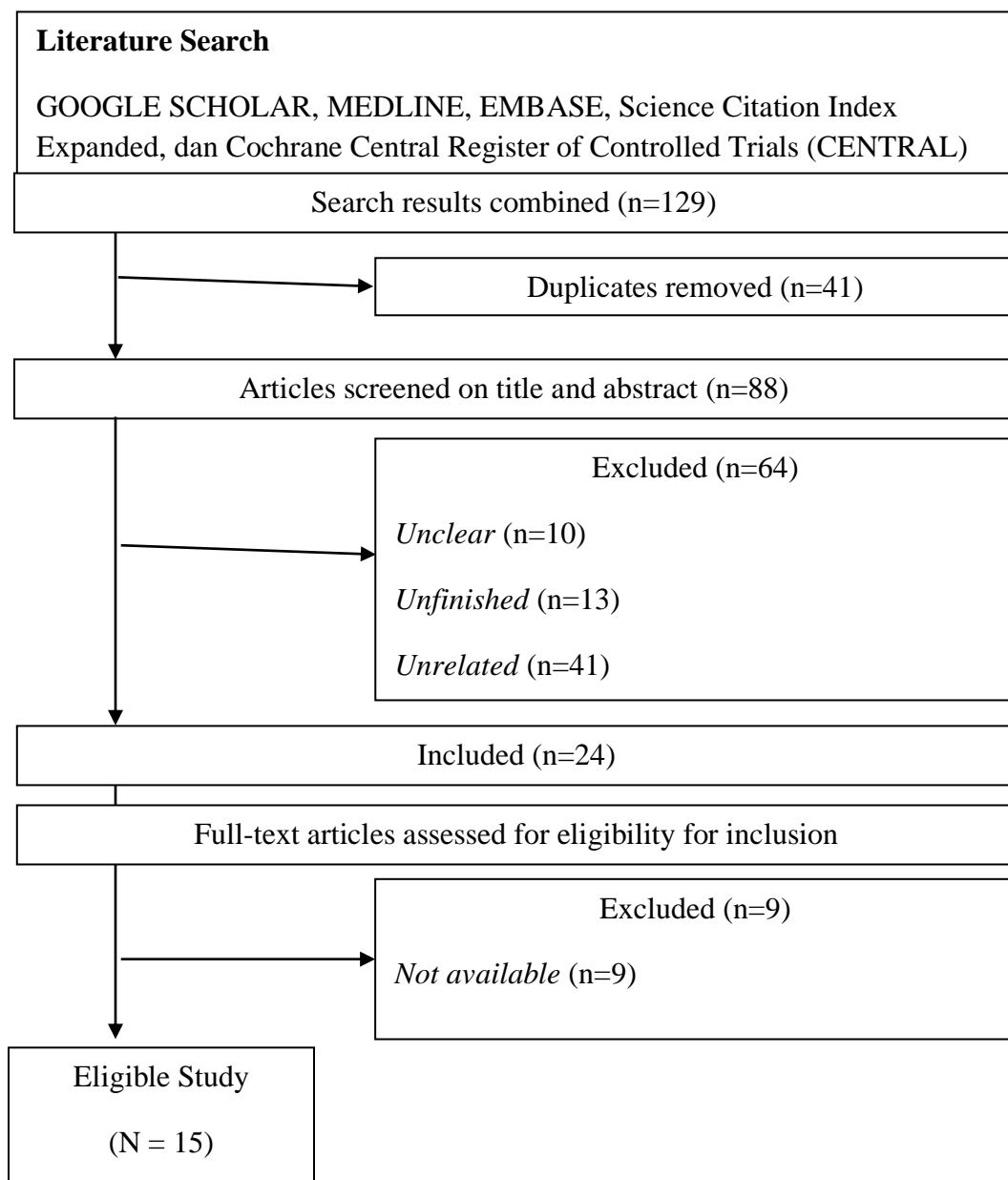


Figure 1: Flowchart of a systematic search of papers with exclusion criteria used at each stage.

Table 1. Systematic literature review on the effectiveness and efficacy of clinical pathways use on financing results

Author	Objective	Country	Parameter	Charge	Results
Falconer et al.,	Average hospital	USA	Costs for hospital sleep days,	Not reported	+ 25 US\$ Favors usual

1993 ⁶	expenses to represent the direct costs of rehabilitation		medical and rehabilitation services (including professional fees), equipment, medications and procedures (radiography, laboratory tests, injections)		care
Gomez et al., 1996 ⁷	Mean hospital expenses	USA	Room, nursing care, laboratory tests, therapy	Physician fees	- 4 919.18 US\$
Kollef et al., 1997 ⁸	Mean hospital expenses	USA	Not reported	Physician fees	+ 261 US\$ Favours usual care
Roberts et al., 1997 ⁹	Mean hospital expenses (direct and indirect expenses)	USA	Professional fees	Not reported	- 641.54 US\$
Johnson et al., 2000 ¹⁰	Mean hospital expenses	USA	Room, medication, laboratory tests and respiratory therapy	Physician fees	- 743.08 US\$
Philbin et al., 2000 ¹¹	Mean hospital expenses	USA	Not reported	Not reported	- 887.03 US\$
Kim et al., 2002 ¹²	Mean hospital expenses (direct expenses)	USA	Remains unclear, only "total direct costs" reported	Professional fees	- 836.00 US\$
Aizawa et al., 2002 ¹³	Insurance points (including direct and indirect expenses)	Japan	Dosage, injection, treatment, surgery and anesthesia, examination, diagnostics, room, medical treatment	Not reported	- 6 941.30 Hospital insurance points
Kiyama et al., 2003 ¹⁴	Mean hospital expenses (direct expenses)	Japan	Total medical costs, including medication and examination (physician fees)	Fixed costs	- 2 771.94 US\$
Usui et al., 2004 ¹⁵	Insurance points (including direct expenses)	Japan	Treatment (antibiotic infusion), laboratory and	Fixed costs	- 9 710.00 Hospital insurance points

			radiography tests		
Bauer et al., 2006 ¹⁶	Mean hospital expenses (direct expenses)	USA	Not reported	Not reported	– 3 316.19 US\$
Kampan, 2006 ¹⁷	Mean hospital expenses (remains unclear if direct and indirect costs have been used, only “mean expenses” reported)	Thailand	Not reported	Not reported	– 52.63 US\$
Maidin, et al. 2017 ¹⁸	Mean hospital expenses (direct expenses)	Indonesia	Total cost of treatment, including treatment and examination (doctor's fee)	Fixed costs	Null with negative cost balance (Positive results)
Neubauer, 2020 ¹⁹	Mean hospital expenses (remains unclear if direct and indirect costs have been used, only “mean expenses” reported)	Netherlands	Remains unclear, only “total direct costs” reported	Professional fees	\$506,481
Handayani, 2020 ²⁰	Mean hospital expenses (daily)	Indonesia	Room, nursing care, laboratory tests, therapy	Physician fees	Rp 919.238.- (positive results with a negative balance)

4. DISCUSSION

CHARACTERISTICS OF CLINICAL PATHWAYS AS QUALITY STANDARDS IN HEALTH FACILITIES

Clinical Pathways are a tool used to train the evidence-based and has been widespread

since the 1980s. Clinical Pathway purposes to explain clinical practice instruction recommendations into clinical care processes within the unique culture and environment of healthcare institutions, thereby maximizing patient safety and clinical efficiency.²¹

Clinical Pathways have to be developed according to the best available sign, such as clinical practice instruction or a systematic review. They have the potential to reorganize clinical practice for a specific patient with a certain diagnosis or undergoing a particular procedure. It means that Clinical Pawathys explain the structured multidisciplinary care strategies that detail important stages in caring for patients with a specific clinical issue. In everyday life, Clinical Pawathys creates confusion and a lack of agreement on the internationally agreed definition of Clinical Pawathys. A recent study revealed 84 different terms that may refer to Clinical Pawathys included care maps, critical paths, protocols, and integrated care pathways.²²⁻²⁴

Nevertheless, several explanations vary in the content criteria described. EPA expresses a clinical pathway as a complex intervention for the shared decision-making and group of care processes for a well-defined group of patients during a well-defined period. Characteristics of pathways of care are explicit statements about the goals and key elements of evidence-based care, best practice, and patient expectations and characteristics; facilitation of communication between team members and with patients and families; coordination of the care process by coordinating the roles and sequence of activities

of the multidisciplinary care team, patients and their relatives; documentation, monitoring, and evaluation of variances and outcomes, and identification of appropriate resources.²⁵

The EPA definition is less specific. It doesn't let Clinical Pawathys be differentiated from related concepts or approaches. A difference is needed when dealing with the problem of strategy effectiveness.²⁵

Regardless of the terminology used, the Clinical Pawatys notion is the features and content of the strategy. From the separation of published clarifications and explanations, an operational meaning of CPW has been planned.²²⁻²⁴

Therefore, a Clinical Pawathy is an organized plan of multidisciplinary care as follows:²²⁻²⁴

- Translate procedures or proof into local structures.
- The steps in treatment consist of plans, pathways, algorithms, guidelines, protocols, or other "action inventories" (interventions have a criteria-based timeline or progression).
- To organize care through certain clinical procedures or health care in a certain population.

Theoretically, Clinical Pawathys can be applied in part of healthcare, namely chronic,

acute, preventive, and palliative care. They highlight processes about effectiveness, patient safety, and/or patient-centredness. CPWs are strongly related to recommendations from clinical strategies, if available for the specific condition.^{24,26-29}

The underlying reasons why CPW should contribute to the quality of health care are explained, along with an overview of what is being done in European countries regarding specific quality strategies. At the same time, the following sections provide an overview of the available evidence regarding the cost-effectiveness of a particular strategy. The next section addresses implementation questions, and the final section provides conclusions for policymakers.²⁷

THE ROLE OF THE HOSPITAL/INSTITUTION IN THE ESTABLISHMENT OF CLINICAL PATHWAYS IN ACHIEVING COST-EFFECTIVENESS

The data of hospital charges are described as direct hospital charge and as total charge, including administrative charge. Due to the low number of high-quality studies evaluating hospital charges, this study investigated all available objective charge data, such as hospital charges. This highly variable set

of reported charge measures precludes further economic evaluation. Therefore, we concentrate on the direct charge effects of Clinical Pathways rather than their charge effectiveness.^{30,31}

The clinical pathway has confirmed its effectiveness in establishment the cost-quality relationship both qualitatively and quantitatively. Adopting clinical pathways across multiple situations has been consistently related to the reduced extent of stay and charge per case. This is partly due to improved direction and communication between caregivers and health workers of hospital management.^{21,31}

At the institutional level, clinical pathways offer the means to efficiently categorize system problems that inhibit, rather than support, effective patient care. Teamwork became the organizational norm, and health workers better knew clinical resource management, namely the allocation of health workers, work practices, rules, and organizational resources needed to convey clinical service^{30,31}

A quality element is included in the process by including the desired clinical outcome in the clinical pathway. This declares that physicians are not "rushed through the system" and discharged before getting a suitable clinical status. The clinicians are more satisfied because treatment runs more smoothly and

patient outcomes increase. Health workers think their abilities are being put to better use, and they feel they have ownership of the care process. Patients also enter the hospital with realistic expectations of their treatment and outcomes.²⁷⁻²⁹

The first step in developing the clinical pathway program is to classify the population of target patients. It involves gathering data on the epidemiology of a population or public disease, use of hospital services, and availability of primary hospital resources. A decision is carried out to improve a particular clinical pathway. The data must focus on the population of target patients and deliver information to the care team such as average length of stay, common problems met during hospitalization, reasons for suspending discharge, etc. The analysis of current practice patterns compared to available published and reviewed clinical practice strategies should be carried out whenever possible. The critical assessment of current clinical practice is critical in developing clinical pathways according to sound clinical decision-making. Moreover, the process of clinical pathway development contains carrying together a multidisciplinary care team to explain the details of the treatment plan as directed by the lead clinician.^{32,33}

FACTORS AFFECTING THE EFFECTIVENESS OF CLINICAL PATHWAYS IN ACHIEVING COST-EFFECTIVENESS

Several previous research results have confirmed that implementing clinical pathways can decrease patient treatment time in hospitals. Uchiyama et al., 2002 stated that pre-surgical outpatient checks were the main factor in reducing the length of stay in hospital by clinical pathway. In addition, the length of hospital stay decreased when implementing the clinical pathway. The majority of studies on the implementation of clinical pathways are cohort studies using historical control groups. Thus, as a control group, the actual medical care system decreased the length of hospital stays.³⁴

One of the determining factors for the effectiveness of Clinical Pathway implementation is compliance, starting from the preliminary patient assessment step to the therapy process. Consequently, it is important to size the level of compliance of medical workers in carrying out standardized services according to the Clinical Pathway. The low consciousness of medical workers that the implementation of clinical pathways is essential for the sustainability of the organization and the lack of understanding among medical workers to deliver services according to the compatibility between

clinical diagnoses and insurance diagnoses is one of the causes of low compliance³⁵

The last variable is the satisfaction of the patient. This is another outcome variable analyzed in most studies in China.²⁶ In this study, patients in the clinical pathway group have higher satisfaction than the control group, shorter hospital stays, and lower hospital costs. Patients benefit from better medical services. Several studies have mentioned the satisfaction of patients when carrying out the survey. However, the results would be more credible if the investigation was conducted at the end of hospitalization.³⁶

The application of clinical pathways reduces the charge of the total hospitals. The detailed calculations of costs are according to the resources used, the charge of all examinations, substructure, and treatments showed a substantial reduction between the clinical pathway and the control group. This result indicates that, by decreasing diagnostic testing and length of hospital stay, infrastructure charges are decreased, and the total charge is cheap. The adoption of clinical pathways reduces total costs but increases charge per day, reducing inpatient charge per patient and improving profits per bed.³⁶ However, none of the included studies mentions or investigate the resources and charge of developing and applying clinical pathways in

the charge analysis. Besides, Rotter et al., (2008) mentioned that low-volume hospitals would be helpless from the adoption of clinical pathways.

DISEASE PREVENTION AND APPLICATION OF PHARMACOECONOMIC PRINCIPLES IN THE MANAGEMENT OF CATASTROPHIC/CHRONIC DISEASES

As previously explained, clinical pathways play a major role in various chronic diseases and diseases that can predict the course of the disease. One of the group diseases that fall into this category is catastrophic/chronic disease.³⁷

As a disease whose treatment takes a long time and costs a lot of money, catastrophic/chronic diseases absorb much JKN financing. In 2018, for example, claimed the cost of this disease, including heart disease, chronic kidney failure, and cancer, accounted for about 22% of all JKN claims. However, although JKN was proven to be able to ease the patient's economic burden, out-of-pocket expenditure at the household level for inpatient and outpatient services was still quite high, especially for catastrophic/chronic diseases.³⁷

To reduce the burden of financing for catastrophic/chronic diseases, efforts are needed to prioritize health promotion and disease

prevention. Various studies have found that countries, such as Japan, China, New Zealand, Finland, and the United Kingdom, which invest more of their health budgets in improving health promotion and disease prevention efforts have succeeded in reducing the prevalence and cases of death from heart disease and other non-communicable diseases.³⁷

Prioritizing aspects of health promotion and disease prevention is the task of all parties, both the government and the Healthcare and Social Security Agency (BPJS) and non-government parties (academics, the private sector, and the wider community). Thus, the policies that need to be taken are as follows:³⁷

- Change people's behavior in the form of increasing awareness that economic losses due to catastrophic/chronic diseases are large and long-term in nature
- Increase public funding to manage and reduce economic losses due to catastrophic/chronic diseases and not reduce the cost of JKN claims for these diseases

In the care of patients with catastrophic/chronic diseases, pharmacoeconomic principles need to be applied. Pharmacoeconomic principles prioritize the use of safe, effective, and affordable drugs and pay attention to the principle of justice. The

principle of pharmacoeconomics is based on careful control of the benefits and costs of using a drug according to reports of good clinical trial results.³⁷

With pharmacoeconomic principles, policymakers have alternative new drugs that are more cost-efficient. The use of these drugs has been scientifically proven to reduce health care costs, including hospital costs, medical treatment costs, and health personnel costs, for patients with catastrophic/chronic diseases. The management of catastrophic/chronic diseases is carried out in the following ways.³⁷

- Provide a fair allocation of funds for people with catastrophic disease
- Apply pharmacoeconomic principles as a consideration in the selection of therapy
- Calculate the quality adjusted-life year (QALY) for patients with catastrophic disease
- Determine the amount of willingness to pay (WTP) to increase one QALY
- Increase the participation of the drug industry in the form of special pricing
- Prioritize symptomatic treatment

5. CONCLUSIONS AND SUGGESTIONS

Implementation of clinical pathway for the management of patients in hospital can improve hospital cost efficiency. The choice of

implementing clinical pathway strategies should be based on considerations of the expected costs and benefits of pathway interventions for local healthcare providers and policymakers. It should be noted that developing and implementing CPWs consumes a significant amount of resources. This corresponds to the fact that true cost savings are determined by the number of cases (volume) of the condition targeted by the pathway.

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