



## Clinical care pathway strengthens interprofessional collaboration and quality of health service: a literature review

Mira Asmirajanti, Achir Yani Syuhaimie Hamid\* and Tutik Sri Hariyati

Faculty of Nursing, Universitas Indonesia, Depok, Indonesia

### KEYWORDS

Clinical pathway;  
Care pathway;  
Interprofessional  
collaboration

### Abstract

**Objective:** To review the effectiveness of a clinical care pathway on interprofessional collaboration and quality of health service.

**Method:** A review was performed of literature published from 2000 to 2015, with the following keywords: clinical pathway, care pathway, and interprofessional collaboration.

**Results:** Evidence depicted the positive results of nursing care for clients, health care professionals and facilities. The research results were implemented at different facilities using several research designs, from descriptive to experimental. A clinical pathway was used as a tool in various clinical situations including in emergency, elective surgery, and pre-post-surgery, as well as in common clinical cases. It was administered by the health care professionals in providing care, encompassing the comprehensive process from diagnosis to clinical audit. Health care professionals should engage in active collaboration during the implementation of a clinical care pathway. In implementing the standard of input, process, and outcome of care to clients, health care professionals should emphasize the process and outcome of care and eliminate unnecessary or inefficient treatments.

**Conclusions:** A clinical care pathway could reduce the average length of stay for patients, increase cost effectiveness, and, consequently, improve the quality of service. To optimize the care process, the pathway should be implemented of multidisciplinary health care team.

© 2018 Elsevier España, S.L.U. Todos los derechos reservados.

## Introduction

Health care services must be continuously improved in terms of quality and cost effectiveness. The quality, efficiency, and accessibility of health care services is one of the research priorities in health care management<sup>1</sup>. Hospitals commonly skip giving thorough and evidence-based infor-

mation regarding treatments to patients and their families because the patients response is different<sup>2</sup>.

A clinical pathway is a strategy to support evidence-based practice and is efficient to guide the implementation clinical treatment for various patient conditions. It comprises the algorithms which are illustrated by flow charts, a set of decisions, and complete treatment<sup>3,4</sup> aimed at an optimal

\*Corresponding author.

Email: ayanihamid@yahoo.co.id (A.Y. Hamid).

treatment process through systematic and timely interprofessional decision-making and interventions<sup>5</sup>. A clinical pathway is a strategy to improve collaboration between physicians, case managers, nurses, pharmacists, physiotherapists, and other health professionals<sup>6</sup>.

It is necessary to discern to what extent a clinical pathway affects the collaboration between health care professionals and the quality of health care services. Therefore, in this paper, we present our findings based on a review of literature related to clinical pathways.

## Method

Literature relevant to clinical pathways published from 2000 to 2015 was reviewed. Articles were searched through electronic databases, including Medline, Clinical of Nursing, Advanced Nursing, Elsevier, BMC Medicine, Implementation Science, Trials, and EMA. We used the following search terms: clinical pathways, care pathways, and interprofessional collaboration. Articles were collected and selected according to predetermined keywords, without restriction on the study method of the articles. The review included the title, abstract, research objectives, research methods, instruments used, and research results<sup>7</sup>.

The selected literature consisted of original articles from countries in Asia, Europe, and the USA. These articles consisted of quantitative and qualitative research related to clinical pathways, care pathways, and interprofessional collaboration to improve the quality of service. Research was carried out in health facilities, and study designs comprised the following: cluster randomized clinical trials (cRCT), quasi-experimental, cohort, case-control, case studies, and focus group discussions.

## Results

A total of 44 articles were obtained from the search. Of these, 20 articles were excluded as they did not meet the criteria of the original paper. We finally reviewed 24 articles with the following designs: 4 cluster randomized clinical trial (cRCT), 6 quasi-experiments, 6 cohorts, 1 case-control, 4 case studies, 1 interview, and 2 focus group discussions.

The quantitative samples of the reviewed articles covered of a variety of clinical conditions: pneumonia, heart disease, chronic obstructive pulmonary disease, and post-surgery. The reviewed articles also reported response on health care team related to clinical pathway. The articles were categorized into interprofessional collaboration and clinical care pathways.

## Interprofessional collaboration

Interprofessional collaboration is the service provided by a team of different health care professionals and is essential to ensure effective clinical treatment<sup>8</sup>. The health care team performs interrelation and interaction throughout the input, process, and output of patient care<sup>6</sup>. Members actively collaborate in implementing comprehensive nursing

care. The process involves multidisciplinary interventions with a focus on predetermined outcomes<sup>9</sup>.

Patients as a service centered care should be elaborated in the implementation of the nursing process to boost patient recovery and to improve efficiency and service quality<sup>10</sup>. The key to successful interprofessional collaboration is communication, which should be carried out continuously between the health care team and the patient. Patient satisfaction is an indicator of the success of the interprofessional collaboration. The health care team should have the same perception of the quality of service<sup>11</sup> (Table 1).

## Clinical care pathway

A search for "clinical pathway" turned up many terms in the collated published literature: clinical pathway, care pathway, integrated clinical pathway, integrated care pathway, and wellness pathway. Evidence-based clinical pathway could be defined as a strategy<sup>4</sup>, standard, diagnosis, and procedure for health personnel when performing comprehensive patient care<sup>13</sup>.

A clinical pathway can be used in all types of clinical settings, ranging from emergency, elective surgery, pre- and post-surgery, or general health facilities. It can identify the condition of the patient at the hospital, clinic, or the patient's home. A clinical pathway is a standard of care delivery that begins with assessment, diagnosis, information support, rehabilitation, and clinical audit<sup>13</sup>. The pathway can also help to identify the critical components impeding patient care or supporting facilities<sup>3</sup>.

A clinical pathway provides detailed instructions for each part of patient management according to the specific condition within a certain period, patient progress, and the expected outcome. The pathway generally describes the types of clinical treatment based on patient needs, in the form of algorithms for planning and systematic management of patients with specific diseases and diagnoses<sup>14</sup>. The flow of the clinical pathway must be brief and concise to guide all health professionals in care delivery. Nurses play an important role in comprehensive patient care by conducting nursing assessment, monitoring, intervention, evaluation, and rehabilitation<sup>10,15</sup>.

In one study we reviewed, a clinical pathway was used in thrombolytic treatment for patients with acute myocardial infarction (AMI) in rural areas. The AMI mortality rate in rural areas is remarkably high since the administration of thrombolytic therapy is not considered the emergency

**Table 1** Typology of interprofessional collaboration

Category	Subcategory	References
Interrelation and interaction	Doctor, nurses, physiotherapists, and social workers	4-6,9
Communication	Health care professional and patient	10-12
Quality improvement	Input, process, and output	2,3,6

**Table 2** Overview of the papers on clinical pathway for different cases

Reference	Year	Main focus	Conclusion
Perer et al <sup>14</sup>	2015	The utilization of care pathways using electronic medical record	Analyzing the diagnosis and treatment cohort in hyperlipidemia patients with hypertension or diabetes mellitus
Han et al <sup>15</sup>	2015	Effectiveness of service and education of health in the communities by using pathway	Patients and health workers benefited from the positive impact of clinical pathways
Zander <sup>16</sup>	2002	Standards that can bridge the gap between patients and health care professionals	A clinical pathway is a good tool for patient care programs, as evidence-based practice
McClimens et al <sup>17</sup>	2013	A clinical pathway tool used to refer patients from hospitals to health centers	Integrated services between hospitals and health centers are essential to meet the needs of the population. This is a tool for the transformation of long-term health care. It can meet the needs of complex societies in terms of health, welfare and lives independently not depending on the other peoples

treatment. Clinical pathway administration of thrombolytic therapy is the best practice for patients with AML, leading to better and timely outcomes, thereby reducing mortality<sup>4</sup>.

Another study assessed the implementation of clinical pathway for patients with multi-system disorders such as paraplegia and tetraplegia. Paraplegia and tetraplegia are multi-system disorders that affect several organs and physiological functions due to spinal cord or bone marrow injury. Patients who are not treated properly are at higher risk of death. The management of this case covers the inpatient care during the acute phase to the phase of rehabilitation in the outpatient or home setting<sup>16</sup> (Table 2).

### Impact of interprofessional collaboration and clinical care pathways towards quality of health care service

A clinical pathway provides guidance with the multidisciplinary approach of patient management. With the help of this tool, health care providers can estimate the duration of treatment for each case. They can also determine the length of the queue of patients according to the number of patients being treated, and, with that information, they can calculate the total time required for the health care system<sup>9</sup>.

A clinical pathway assists health care providers to deliver more effective and efficient care, as the treatments for the specific cases are standardized. This could lead to fewer complications and shorter average length of stay (ALOS) at the hospital<sup>10</sup>. ALOS, however, is not only influenced by clinical or rehabilitation outcomes but also by supporting aspects such as logistics, a patient's social and cultural factors, individual factors, and health insurance. Health insurance is set up on a relative diagnosis group basis, which calculates the fixed budget of the patient per day, fluctuating each year<sup>5,21</sup>.

Treatments of patients with carcinoma of the head and neck are the most expensive among all malignant cancer care in the health care system. The hospitalization expenses make up the highest cost, especially in the post-surgery treatment. Post-operative care is a complex process and requires long ALOS<sup>12</sup>. Collaborative care involving physicians, nurses, physiotherapists, and respiratory specialists is necessary in the recovery phase of head and neck carcinoma cases. This treatment requires continuity to achieve cost-effective clinical interventions. A clinical pathway provides guidelines for specific diagnosis and intervention in the particular time frame and condition (Table 3). This can minimize delays, mistreatments, and duplications of interventions, and maximize the effectiveness and efficiency of care<sup>11,22,23</sup> (Table 4).

**Table 3** Comparison of average length of stay and cost effectiveness for patient intervention with clinical pathway and control

	Diagnosis		Sample
	Intervention/pre	Control/post	P value
Hip fracture <sup>8</sup>	56 group	56 group	< 0.05
Total knee arthroplasty <sup>18</sup>	208 patients	192 patients	0.0073
Head and neck surgery <sup>13</sup>	56 patients	62 patient	< 0.001
Infant with pneumonia <sup>19</sup>	25 patients	25 patients	< 0.05
Esophagectomy <sup>20</sup>	12 patients	12 patients	< 0.05

**Table 4** Overview of the papers on interprofessional collaboration and clinical pathway and their relations to quality of health service

Reference	Year	Main focus	Conclusion
Vanhaecht et al <sup>10</sup>	2007	Methods clinical pathway as a multidisciplinary tool to meet patient needs in a transparent manner	All health professionals coordinate to provide care process and follow-up to a patient. Patients and families are informed and involved in meeting their own needs
Yelnik et al <sup>21</sup>	2011	Clinical pathway is a brief documentation that is designed to make it easy to read for health care personnel	Patients will be addressed by all health professionals, according to the patient's needs
Pelt et al <sup>11</sup>	2016	Mobilization care pathway for patient with total joint arthroplasty (TJA) can accelerate the patient recovery	The use of multidisciplinary care pathway for early mobilization in patients with postoperative TJA can boost patient recovery
Tasseau et al <sup>22</sup>	2012	Care pathway determines the appropriate resources and materials necessary to meet the needs of patients	The proper use of resources and materials will provide optimal care for patients

## Discussion

Interprofessional collaboration embraces all health professions—physicians, nurses, physiotherapists, and social workers—in an equitable responsibility and accountability according to each role. Health care teamwork is a dynamic process consisting of two or more health professionals with different educational backgrounds and skills<sup>4,9</sup>. It can minimize the duplication of interventions to attain the best outcome for the patient in an effective and efficient manner, leading to patient satisfaction. Interprofessional collaboration allows for interdisciplinary sharing to resolve health problems, to perform assessments, and for planning and treatment. Effective communication is key in implementing interprofessional collaboration to improve the quality of health services<sup>10</sup>. Interprofessional collaboration should be developed and given ongoing support by the management of health care facilities. It must be implemented transparently and evaluated continuously by the management of health care facilities so as to increase efficiency and effectiveness. Health care facilities should create equality and encourage the cooperation of all healthcare professions.

A clinical pathway can be stored in a hospital database to be used as a source for further analysis in diagnosis or treatment-related studies. An exploratory study on the utilization of medical records showed that clinical pathways are more meaningful and beneficial for deeper studies if they are consistently and thoroughly documented<sup>23</sup>. Basic monitoring, such as blood pressure, temperature, pulse, height, and weight monitoring should be well-recorded. This analysis can be used to evaluate the activities carried out by health workers<sup>14</sup>.

A qualitative study to examine the effectiveness of service and education of health care in the community was also reviewed in this study. The study was conducted for six months by interviewing 25 patients aged 60 years and over<sup>15</sup>. Patients and health professionals reported positive impacts of clinical pathways. Patients received continuous health education which contributed to the maintenance of their condition and compliance with follow-up care<sup>24</sup>.

A clinical retrospective study found that a clinical pathway is the key for health care professionals to carry out care activities. Each patient has different needs and requires different treatments<sup>16</sup>. Clinical pathways bridge the gap between patients and health care professionals. They provide directions to the health workers to determine the patient outcomes, which range from attaining comfort to dying with dignity. It is an easy tool to be implemented without consultation to the other health care professional so that the results are more faster<sup>20</sup>.

Clinical pathways are not only carried out at hospitals but in all healthcare facilities—for example, in community healthcare settings. Quasi-experimental studies and focus group discussions have reported that patients who require further treatment need to be referred to the health center. Clinical pathways are required to integrate care from hospitals to health centers to facilitate patient recovery<sup>17</sup>.

Some RCTs assessed the decrease in ALOS and financing after implementation of a clinical pathway on several patient diagnoses. A study was conducted in 112 patients with hip fracture at an American hospital, with the result of decreased ALOS<sup>8</sup>. In 400 patients with total knee arthroplasty, clinical pathway contributed to an average decrease in ALOS to 26 days, less pain, and fewer complications. Patients with head and neck surgery had ALOS 7.2 days shorter than the patient group with no clinical pathway<sup>13</sup>. Meanwhile, infant patients with pneumonia who received clinical pathways had less antibiotics, oxygen, and IV fluid therapy than patients in the conventional intervention. However, the esophagectomy patients showed no significant difference of ALOS<sup>19</sup>.

A retrospective study on clinical pathways was conducted among postoperative patients. The researchers reported that clinical pathways facilitate early mobilization, which could reduce complications, decrease hospital acquired infections, improve patient safety, speed recovery, and decrease ALOS<sup>25</sup>. Mobilization of the patient must be identified early in a multidisciplinary approach<sup>21</sup>.

Clinical pathway implementation may lead to lower ALOS. Health care personnel should coordinate and communicate

with patients and their families throughout procedures the care process<sup>26</sup>. Health care professionals should perform a critical analysis of the patient to determine good and proper care. Additionally, all healthcare personnel should work together and be committed to meet the needs of patients, thus increasing the quality of services and cost effectiveness<sup>12</sup>. A clinical pathway is an indicator for the improvement of service quality. It can help reduce the incidence of nosocomial infection and improve patient safety.

## Acknowledgement

The authors would like to thank Dr. Junaiti Sahar, SKp., M App.Sc., Ph.D., who has led us to participate in this study, Mrs. Dessie Wanda, SKp., MN, Ph.D., who has facilitated and continues to motivate us to achieve optimal results, and Miss Chairun Nisah Ardiantari who helped us to conduct this programme review smoothly and correct our report.

## References

- Muliyadi M, Hamid AY, Mustikasari M. Kinerja perawat berdasarkan komitmen pada organisasi dan lingkungan kerja perawat. *Jurnal Keperawatan Indonesia*. 2010;13.
- Vanhaecht K, Sermeus W, Peers J, Lodewijckx C, Deneckere S, Leigheb F, et al. The impact of care pathways for exacerbation of Chronic Obstructive Pulmonary Disease : rationale and design of a cluster randomized controlled trial. *Trials*. 2010;11:111.
- Ozcan YA, Tanfani E, Testi A. A simulation-based modeling framework to deal with Clinical Pathways. *Simulation Conference (WSC), Proceedings of the 2011*.
- Kinsman LD, Rotter T, Willis J, Snow PC, Buykx P, Humphreys JS. Do clinical pathways enhance access to evidence-based acute myocardial infarction treatment in rural emergency departments ? *Aust J Rural Health*. 2012;20:59-66.
- Den Hertog A, Gliesche K, Timm J, Mühlbauer B, Zebrowski S. Pathway-controlled fast-track rehabilitation after total knee arthroplasty: a randomized prospective clinical study evaluating the recovery pattern, drug consumption, and length of stay. *Arch Orthop Trauma Surg*. 2012;132:1153-63.
- Deneckere S, Euwema M, Lodewijckx C, Panella M, Sermeus W, Vanhaecht K. The European quality of care pathways (EQCP) study on the impact of care pathways on interprofessional teamwork in an acute hospital setting: study protocol: for a cluster randomised controlled trial and evaluation of implementation processes. *Implement Sci*. 2012;7:47.
- Hariyati RTS. Mengenal systematic review theory dan studi kasus. *Journal Keperawatan Indonesia*. 2010;13(2):124 -132.
- Olsson L, Hansson E, Ekman I, Karlsson J. A cost-effectiveness study of a patient-centred integrated care pathway. *J Adv Nurs*. 2009;65:1626-35.
- Cheah J. Development and implementation of a clinical pathway programme in an acute care general hospital in Singapore. *Int J Qual Health Care*. 2000;12:403-12.
- Vanhaecht K, De Witte K, Panella M, Sermeus W. Do pathways lead to better organised care processes? *J Eval Clin Pract*. 2009;15:782-8.
- Pelt CE, Anderson MB, Pendleton R, Foulks M, Peters CL, Gililand JM. Improving value in primary total joint arthroplasty care pathways: changes in inpatient physical therapy staffing. *Arthroplast Today*. 2016;3:45-49.
- Ribinik P, Le Moine F, De Korvin G, Coudeyre E, Genty M, Rannou F, et al. Physical and rehabilitation medicine (PRM) care pathways: "patients after total hip arthroplasty". *Ann Phys Rehabil Med*. 2012;55:540-5.
- Dautremont JF, Rudmik LR, Yeung J, Asante T, Nakoneshny SC, Hoy M, et al. Cost-effectiveness analysis of a postoperative clinical care pathway in head and neck surgery with microvascular reconstruction. *J Otolaryngol Head Neck Surg*. 2013; 42:59.
- Perer A, Wang F, Hu J. Mining and exploring care pathways from electronic medical records with visual analytics. *J Biomed Inform*. 2015;56:369-78.
- Han MA, Kwon I, Reyes CE, Trejo L, Simmons J, Sarkisian C. Creating a "Wellness Pathway" between health care providers and community-based organizations to improve the health of older adults. *Journal of Clinical Gerontology & Geriatrics*; 2015;6:111-4.
- Zander K. Integrated care pathways: eleven international trends. *Journal of Integrated Care Pathways*. 2002;6:101-7.
- Mcclimens A, Kenyon L, Cheung H. Exploring placement pathways in nurse education. *Br J Nurs*. 2013;22:8-12, 14-5.
- Ayalon O, Liu S, Flics S, Cahill J, Juliano K, Cornell CN. A multimodal clinical pathway can reduce length of stay after total knee arthroplasty. *HSS J*. 2011;7:9-15.
- Hussein HA. Effect of Using Clinical Pathway on Improving Clinical Outcomes of Infants with Pneumonia. *World Journal of Medical Sciences*. 2014;11:120-31.
- Raman V, Kaiser LR, Erkmén CP. Clinical pathway for esophagectomy improves perioperative nutrition. *Healthc (Amst)*. 2016;4:166-72.
- Yelnik AP, Schnitzler A, Pradat-Diehl P, Sengler J, Devailly JP, Dehail P, et al. Physical and rehabilitation medicine (PRM) care pathways: "stroke patients". *Ann Phys Rehabil Med*. 2011;54:506-18.
- Pradat-Diehl P, Joseph PA, Beuret-Blanquart F, Luauté J, Tasseau F, Remy-Neris O, et al. Physical and rehabilitation medicine (PRM) care pathways: Adults with severe traumatic brain injury. *Ann Phys Rehabil Med*. 2012;55:546-56.
- Edouard P, Ribinik P, Calmels P, Dauty M, Genty M, Yelnik AP. Care pathways in physical and rehabilitation medicine (PRM): the patient after shoulder stabilization surgery. *Ann Phys Rehabil Med*. 2012;55:565-75.
- Ribinik P, Calmels P, Barrois B, Le Moine F, Yelnik AP. Physical and rehabilitation medicine (PRM) care pathways: "patients after rotator cuff tear surgery". *Ann Phys Rehabil Med*. 2011;54:496-500.
- Albert T, Blanquart FB, Le Chapelain L, Fattal C, Goossens D, Rome J, et al. Physical and rehabilitation medicine (PRM) care pathways: "spinal cord injury". *Ann Phys Rehabil Med*. 2012;55:440-50.
- Ribinik P, Calmels P, Edouard P, Genty M, Yelnik AP. Care pathways in physical and rehabilitation medicine (PRM): the patient after proximal humeral fracture and shoulder hemi-arthroplasty. *Ann Phys Rehabil Med*. 2012;55:557-64.