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The Journal of Health and Translational Medicine *(JUMMEC)* was founded in 1996. When *JUMMEC* (abbreviated for "Journal of University of Malaya Medical Centre") was first conceived, it was only publishing research findings that had been conducted in University of Malaya Medical Centre. Over the next few years, this journal grew in function and rapidly became popular amongst the local universities. It was not long thereafter that this journal began to gain interest by the international research community. In 2012, it was decided that a change in the journal name had to be made in order to reflect the global participations to this journal. However, we have never deviated from our primary aim, which is to facilitate the exchange of ideas, techniques and information among all members of the medical health practitioners and scientists alike.

Topics covered include: All aspect of medicine, medical systems and management; surgical and medicinal procedures; epidemiological studies; surgery and procedures (of all tissues); resuscitation; biomechanics; rehabilitation; basic science of local and systemic response related to the medical sciences; fundamental research of all types provided it is related to medical sciences; cell, proteins and gene related research; all branches of medicine which may include (but not limited to) anaesthesia, radiology, surgery, orthopaedics, ortholaryngiology etc. Regular features include: original research papers; review articles and case reports.

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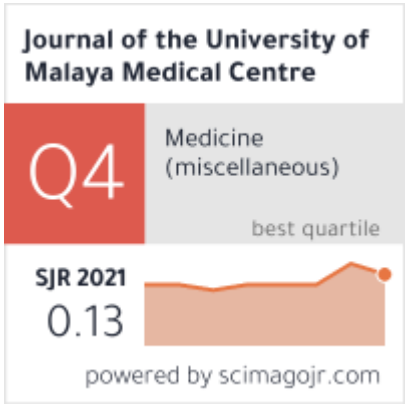

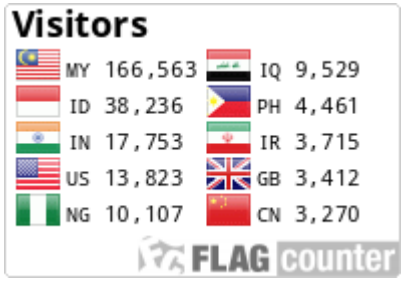

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The University of Malaya, Kuala Lumpur, Malaysia hosted the APACPH-KL Early Career Global Public Health Conference: Implementation Science for Improving Population Health on the 11th and 12th of April, 2019. The two-day conference was officiated by APACPH-KL President, Yang Berbahagia Datuk Professor Awang Bulgiba Awang Mahmud. The conference gathered experts and researchers in public health for an exchange and expansion of knowledge and to share experiences on how to tackle public health issues, which are sometimes borderless.

Organized by Asia-Pacific Academic Consortium for Public Health Kuala Lumpur (APACPH-KL), in collaboration with the Centre for Population Health (CePH), the Department of Social and Preventive Medicine (SPM), Faculty of Medicine, University of Malaya, and the University of Airlangga; the conference aimed to leverage on the global public health education and research of Asia-Pacific universities to address global public health issues through interaction with public policy and media. It also hoped to develop and enhance the network amongst international fellow students and early career public health researchers.

The conference offered an excellent platform for early-career public health professionals and students to exchange ideas and network with regional public health thought leaders and researchers. The organizers succeeded in bringing people from the industry, academia, NGOs, and international organizations to make presentations and have interactive discussions. Participants made oral presentations on Health Systems and Policy, Epidemiology, Occupational and Environmental Health as well as Behavioural and Reproductive Health.

This conference hopes to build up the confidence of early-career public health professionals and postgraduate students in presenting and publishing articles in well-regarded peer-reviewed journals. It was also the perfect opportunity for them to network and interact with one another. APACPH-KL and the University of Malaya look forward to more of such activities being conducted in the near future.

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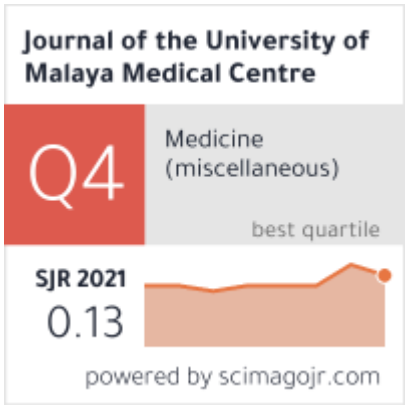

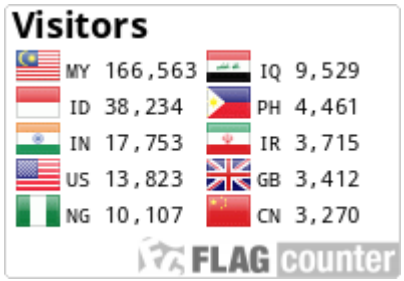

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Editors

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Department of Pharmacology
Faculty of Medicine
Universiti Malaya
50603 Kuala Lumpur
Malaysia

Azlina Amir Binti Abbas, MD, AdvDipMed Sci, MS Ortho
Department of Surgery Orthopaedic
Faculty of Medicine
Universiti Malaya
50603 Kuala Lumpur
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Kiew Lik Voon, BBioMedSc, MSc (Pharm), PhD
Department of Pharmacology
Faculty of Medicine
Universiti Malaya
50603 Kuala Lumpur
Malaysia

Wong Pooi Fong, BBioMedSc, DipTropMed, MMedSc, PhD
Department of Pharmacology
Faculty of Medicine
Universiti Malaya
50603 Kuala Lumpur
Malaysia

Anwar Bin Norazit, BBMedSc, MMedSc, PhD
Department of Biomedical Science
Faculty of Medicine
Universiti Malaya
50603 Kuala Lumpur
Malaysia

Suzita Binti Mohd Noor, BBMedSc, MMedSc, PhD
Department of Biomedical Science
Faculty of Medicine
Universiti Malaya
50603 Kuala Lumpur
Malaysia

Thamil Selvee A/P Ramasamy, BSc, PhD
Department of Molecular Medicine
Faculty of Medicine
Universiti Malaya
50603 Kuala Lumpur
Malaysia

Victor Hoe Chee Wai Bin Abdullah, MBBS, MPH, MPH(OH), MEng(SHE), PhD
Department of Social and Preventive Medicine
Faculty of Medicine
Universiti Malaya
50603 Kuala Lumpur
Malaysia

Noor Azlin Binti Yahya, MDenSci, BDS, DipTra
Department of Restorative Dentistry
Faculty of Dentistry
Universiti Malaya
50603 Kuala Lumpur
Malaysia

Tan Choo Hock, MBBS, PhD
Department of Pharmacology
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50603 Kuala Lumpur
Malaysia

Wong Li Ping, BSc, MMedSc, PhD
Department of Social and Preventive Medicine
Faculty of Medicine
Universiti Malaya

Faculty of Medicine
Universiti Malaya
50603 Kuala Lumpur
Malaysia

Farhana Binti Fadzli, MBChB, MRad
Department of Biomedical Imaging
Faculty of Medicine
Universiti Malaya
50603 Kuala Lumpur
Malaysia

Anand A/L Sanmugam, MD, MSurg
Department of Surgery
Faculty of Medicine
Universiti Malaya
50603 Kuala Lumpur
Malaysia

Nadia Binti Atiya, MB, BCh, BAO, BMedSci, MPath
Department of Medical Microbiology
Faculty of Medicine
Universiti Malaya
50603 Kuala Lumpur
Malaysia

Vinod Pallath, BSc, MSc, PhD
Medical Education & Research Development Unit
Faculty of Medicine
Universiti Malaya
50603 Kuala Lumpur
Malaysia

Mazlina Binti Mazlan, MBBS, MRehabMed
Department of Rehabilitation Medicine
Faculty of Medicine
Universiti Malaya
50603 Kuala Lumpur
Malaysia

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Riyadh, Kingdom of Saudi Arabia

Parveen June Kumar
Blizard Institute
Faculty of Medicine
Queen Mary University of London
Mile End Road
London E1 4NS
United Kingdom

Jeong-Wook Seo
Seoul National University Hospital
103, Daehak-ro, Jongno-gu
Seoul 03080
Republic of Korea

Looi Lai Meng
Department of Pathology
Faculty of Medicine
Universiti Malaya
50603 Kuala Lumpur
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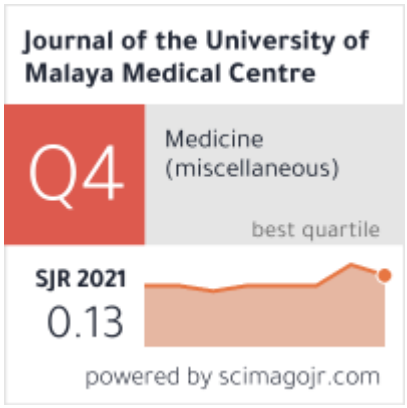

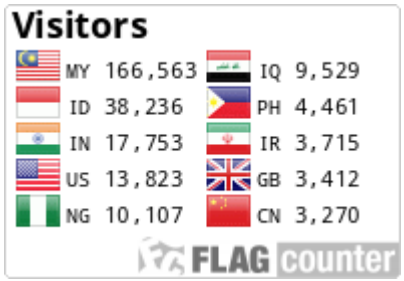

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THE IMPACT OF DOCTORS-NURSES COLLABORATION ON CLINICAL PATHWAY COMPLIANCE IN INPATIENT DEPARTMENT AT AN INDONESIAN PRIVATE HOSPITAL

Siswanto M, Dhamanti I
Department of Health Policy and Administration, Faculty of Public Health Universitas Airlangga, Indonesia

Correspondence:
Michael Siswanto
Department of Health Policy and Administration,
Faculty of Public Health Universitas Airlangga, Indonesia
Email: michael.siswanto-2018@fkm.unair.ac.id

Abstract

Background: Clinical pathway has a direct impact on the care of individual patients, including improved quality of care and improved safety. One of the professional caregivers who influence the successful implementation of the clinical pathway is the doctor. However, doctors are also the factors which reduce the effectiveness of the clinical pathway implementation.

Aim: To compare the implementation of clinical pathway before and after intervention.

Methods: This study was a pre-and-post study design that involved analysis and socialization. For medical record analysis, we included all cases on dengue hemorrhagic fever, typhoid, acute appendicitis, gallstones, and unilateral inguinal hernia that were obtained within 2 periods. The first period was obtained on July 1 to December 31 2016, and then the second period was on April 1 to September 30 2017. We conducted the socialization towards 27 doctors focusing on the importance of clinical pathway and its compliance. We involved the nurses to directly remind the doctors to complete the clinical pathway forms every time the doctors visited the patients from January to March 2017. The reminders were attached to the patient medical records and were checked by the head nurse in every ward. The data were analyzed using *McNemar*.

Results: We collected 142 pre- and 106 post-intervention cases with the stated diagnosis. The average of the clinical pathway compliance before the intervention was 32.40%. After the intervention, the clinical pathway compliance increased significantly to 73.95% (p=0.001047).

Conclusion: Collaboration between the doctors and the nurses is the key factor to improve the clinical pathway implementation in hospital. Reminders for the doctor are kind of the strategies to improve the clinical pathway implementation in the hospital.

Keywords: *Clinical pathway, Doctor, Implementation, Inpatient unit*

Introduction

Clinical pathway was originally developed in the United States, Australia and the United Kingdom as a way to increase efficiency and reduce clinical costs (1). A clinical pathway is a tool that operationalizes best evidence and supports the quality care delivery within and across interdisciplinary teams into a standardized, accessible, and structured point-of-care format (2). The clinical pathways differ from the clinical guidelines and protocols as they are a set of practical treatment processes detailing how to implement clinical guidelines, including both the clinical guidelines and the non-clinical activities (3).

The clinical pathways provide a guarantee as a means to increase the clinician's adoption of evidence-based guidelines and to improve quality of care (4). Clinical pathways have a direct impact on the care of individual patients, including improved quality of care and improved safety (5). Clinical pathways have been proven to be able to reduce the length of hospital stay and costs for the patients (6). Patients' satisfaction increased significantly while using the clinical pathways (7). Clinical pathways can also impact the population of patients with a specific disease or condition, including streamlining ambulatory care and potentially reducing emergency department and urgent care center visits, reducing hospital admissions, and reducing readmissions by ensuring that patients are discharged with the right resources and that they have appropriate and timely post discharge follow-up (8).

The implementation of the clinical pathways may be driven by a variation in the quality of care and outcome for patients with similar health conditions: cardiovascular, respiratory, surgical, cancer, etc. (9). A successful pathway should be both interdisciplinary as well as multidisciplinary. The pathway should clearly delineate the elements of care specifically for each discipline or role, such that there is a structured plan of care to be enacted by each member of the health care team. At the same time, the pathway will promote collaboration between the disciplines by engaging each member and ensuring each member's role as an integral member of the team. Thus, the clinical pathways will result in a transformation, from separate and parallel components of care to care which is seamlessly integrated within and between disciplines (8).

The human factor is unique to the practice of medicine, and unlike cars on a production line, an industry that specializes in taking care of people will inherently encompass situations in which variability cannot be negated (8). A motivated and well-intentioned professional is not sufficient if the team is not interested, or if the system does not support the implementation. Similarly, the system cannot easily push a clinical pathway if the individual professionals or team culture do not support it (10). Engagement of all the relevant staff is necessary to ensure that the proposed aims are achieved, at each stage from the pathway adoption, implementation and maintenance (11). Clinical staff, as the main participants or executors of the clinical pathway, determines the effectiveness of the clinical pathway implementation (12). One of the clinical staff who influences the successful implementation of the clinical pathway is the doctor.

We observed one of the Indonesian's private hospitals that the clinical staff including doctors, nurses, dieticians, clinical pharmacologists had to fill in the clinical pathway form. The clinical pathway form must be filled daily. The case manager will monitor the compliance in filling out the form by very clinical staff. The average compliance of clinical pathway was 52.23% from July 2016 to December 2016. A study in China found a similar condition where 33% of the physicians implemented the clinical pathways were less than 20% (13). Based on our knowledge, there were only a few researches discussing the impact of intervention to doctors with compliance of the clinical pathway. Thus, we decided to analyze the impact of intervention to a doctor's clinical pathway compliance.

Methods

Study Design

This study was a pre-and post-study design at one of the Indonesian private hospitals. We

had different total cases for two different periods based on the number of hospital admissions on the specified time. The first period was on July 1 to December 31, 2016, and then the second was on April 1 to September 30, 2017. For the first period, the populations were 219 cases and for the second period, we had 145 relevant cases. The intervention was done during January 2017 to March 2017.

Intervention

There were two types of interventions, which were socialization and the nurses' reminders for doctors.

Preparation for Intervention

We collected data of the clinical pathways' compliance from the hospital management. We then had a discussion with the hospital management about the clinical pathway definition, standard and procedures.

Description of the Intervention

We held a socialization process about what the clinical pathway is, why it is important to fill out the form and its compliance with 27 doctors on January 2017. We involved the nurses to directly remind the doctors to complete the clinical pathway form every time the doctors visited the patients during January 2017-March 2017. This process was observed and recorded in the observation form by the first author. The reminders from the nurses were documented in the patients' medical records daily and checked by the head nurse at every ward.

Study Procedure

We observed the doctors' compliance in two periods. The quantitative data were obtained from the patient medical records between July 1, 2016 and September 30, 2017. The inclusion criteria included cases with dengue hemorrhagic or typhoid fever or acute appendicitis or gallstones or unilateral inguinal hernia; the patients were adult or aged at least 16 years old and without any comorbidity and complication. We excluded all the clinical pathways forms that were not filled out completely and correctly.

Data Analysis

We compared the data especially the therapy compliance between those periods before and after approaching the doctors. Each clinical pathways form consisted of 4-5 types of therapy. If there were one or more types of therapy that were not checked by the doctors in the clinical pathways forms, it would be categorized as no compliance and vice versa. We counted how many forms that could be categorized as compliance and no compliance and made a proportion from all the forms. We used *McNemar method* in this study to compare the differences between before and after approaching the doctors.

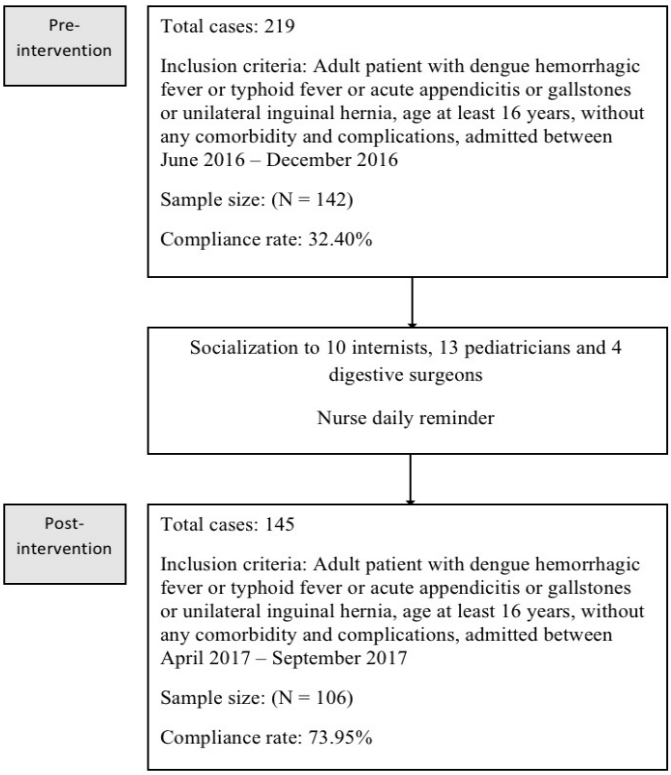

Figure 1: Research process stages

Ethical Approval

This study obtained the ethical approval from the Ethics Committee of the Faculty of Public Health, Universitas Airlangga (617-KEPK).

Results

We collected 142 cases from inpatients with a diagnosis of dengue hemorrhagic or typhoid fever or acute appendicitis or gallstones or unilateral inguinal hernia for the first period.

The average of clinical pathway therapy compliance before intervention was 32.40% from July to December 2016. Typhoid fever achieved the highest therapy compliance which was at 91.84%. However, gallstones and unilateral inguinal hernia were the lowest compliance cases of the clinical pathway, at 0% compliance. The clinical pathway compliances for each diagnosis is shown in Figure 2.

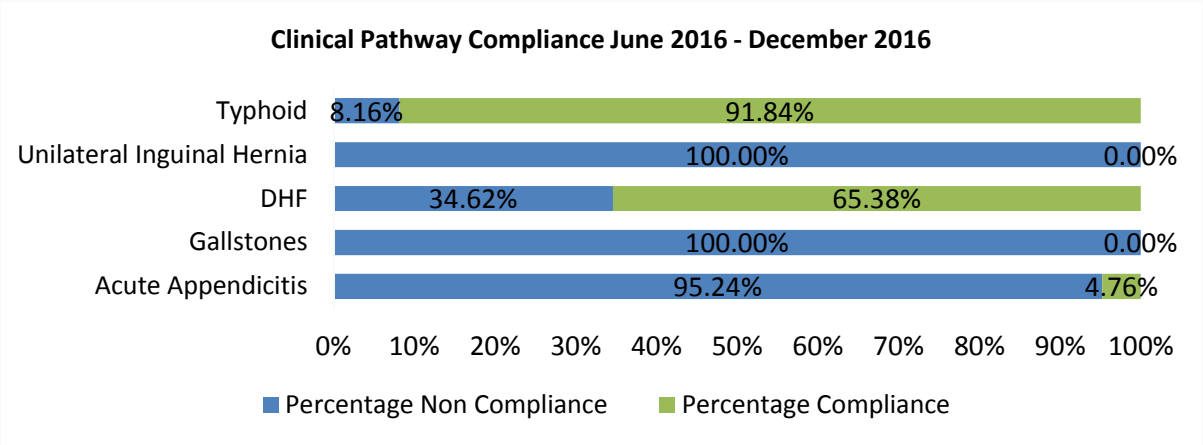

Figure 2: Clinical pathway compliance from July-December 2016

From January 2017 to March 2017, we held meetings with 10 internists, 13 pediatricians and 4 digestive surgeons that discussed the clinical pathway compliance. During the meeting, we discussed 3 topics as mentioned in Table 1. We encouraged them to give therapy according to the clinical pathways. Following the meeting, the nursing staff was responsible for giving reminders to the doctors' every time they visited the patients at the hospital. The reminders were included in the patient's medical records and were checked by their head nurse in every ward.

From April 2017 to September 2017, the clinical pathway therapy compliance increased significantly from 32.40 % in 2016 to 73.95%. All cases, especially the surgical cases such as acute appendicitis, gallstones, and unilateral inguinal hernia increased significantly. The comparison of the clinical pathway compliance between 2016 and 2017 is shown in Figure 3. After all the data were collected, the data of both periods were compared and analyzed using *McNemar*. The analysis results are shown in Table 2.

Table 1: Topics and Results of Meeting with Doctors in January 2017

Date	Topic	Attendant	Results
13 January 2017	What is Clinical Pathway?	10 internists 13 pediatricians 4 digestive surgeons	Remind doctors to fill out clinical pathway form routinely and give therapy as stated in the form
	Clinical Pathway Monitoring		Daily Reminders by nurses for doctors
	Clinical Pathway Compliance in June-December 2016 and Expectation in 2017		Monitoring clinical pathway compliance during April to September 2017

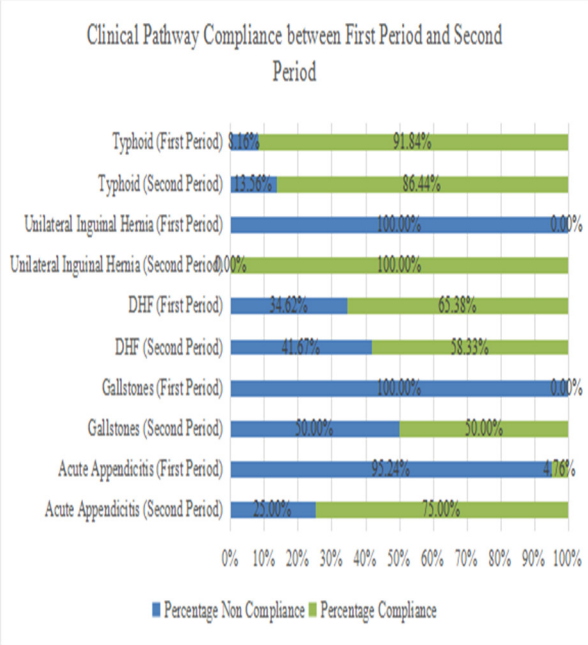

Figure 3: Clinical pathway compliance percentage between first and second period

Table 2: Comparison of clinical pathway compliance percentage before and after approaching doctors

Variables	N	Therapy Compliance (%)	χ^2 Statistics (df)	P Value
First period (before approaching doctors)	142	32.40	10.7424	0.001047(< 0.05)
Second period (after approaching doctors)	106	73.95		

Discussion

In this study, the clinical pathway compliances were improved because of the socialization to doctors and following reminders by the nurses.

Fischer et al. (14) showed that the dissemination strategies could raise the awareness of doctors with clinical pathway. It could be done through educational meetings, outreach visits, workshops, small group discussions and audits with their feedback. Socialization was one of the dissemination types. Barosi (15) proposed the same thing as Fischer et al. The dissemination strategies could increase the compliance of the clinical pathway implementation. Such dissemination needs to be done multidisciplinary and not just for doctors.

In this study, it was proven that by giving reminders, the doctors were able to improve their compliance of the clinical pathways. Barosi showed that the reminders will prompt the clinical staff to perform clinical actions according to the current state of evidence (15). Reminder is a patient or encounter-specific information, provided verbally, on a paper or on a computer screen, which is designed or intended to prompt a health professional to recollect information (16). It can remind them to perform or avoid some action to aid the individual patient care. Within this study, one of our interventions was a reminder from nurses to doctors to give therapy as the clinical pathways form stated. The nurses gave reminders to doctors every time they visited their patients.

Those reminders can be implemented through a computerized system. Reminders can be electronic pop-ups that appear on the screen when a chart is opened or a paper reminder placed in the chart (17). A systematic review by Grimshaw et al., (18) showed that the reminders may have a moderate effect of clinical guidelines implementation. Shanbhag D. (19) stated that reminders improve the therapy compliance in the implementation of clinical pathways. It consistently proved that the reminders can be one of many strategies to increase the compliance of the clinical pathway implementation.

This study proved that dissemination strategies such as socialization and reminders made an improvement for the clinical pathway's compliance. Those reminders proved that collaboration between doctors and nurses were crucial things in patient care. Asmirajanti et al., (20) emphasized that

healthcare staff collaboration can minimize the duplication of interventions to attain the best outcome for the patient in an effective and efficient manner, leading to patient t satisfaction. Mathys et al., (21) stated that collaboration between physicians and nurses may have a positive impact on a number of patient outcomes and on a variety of pathologies. However, the limitations of the proposed indicator we used in this article would be underlined. Our study focused on therapy compliance. This study was only conducted in one private hospital. Collected data were not large enough to represent for clinical pathway compliance in Indonesia.

Conclusion

The result of this study showed that socialization and reminders to the doctors especially from the nurses were able make significant differences for the clinical pathway compliance. These reminders showed the importance of collaboration between doctors and nurses. This information can provide an initial insight especially for hospital management to make a better decision to improve the clinical pathway compliance in hospitals. The reminders to the doctor are kind of strategies to improve the clinical pathway implementation in the hospitals.

Future studies are recommended to examine other indicators such as diagnostic examination, length of hospital stay or statistics to suggest the difference of clinical pathway compliance subsequently providing reminders to doctors. A further study could also be conducted to find other types of intervention strategies in improving the clinical pathway compliances in hospitals.

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KETERANGAN KAJI ETIK
DESCRIPTION OF ETHICAL APPROVAL
"ETHICAL APPROVAL"

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Komite Etik Penelitian Kesehatan Fakultas Kesehatan Masyarakat Universitas Airlangga dalam upaya melindungi hak asasi dan kesejahteraan subyek penelitian kesehatan, telah mengkaji dengan teliti protokol berjudul :
The Ethics Committee of the Faculty of Public Health Airlangga University, with regards of the protection of Human Rights and welfare in medical research, has carefully reviewed the research protocol entitled :

"IMPLEMENTASI ALUR KLINIS DI DEPARTEMEN RAWAT INAP DI RUMAH SAKIT SWASTA INDONESIA"

Peneliti utama : Michael Siswanto
Principal In Investigator

Nama Institusi : Fakultas Kesehatan Masyarakat Universitas Airlangga
Name of the Institution

Dan telah menyetujui protokol tersebut di atas.
And approved the above-mentioned protocol

Surabaya, 27 Desember 2018
Ketua, (*CHAIRMAN*)

Prof. Dr. Merryana Adriani, S.KM., M.Kes
NIP. 195905171994032001