

Medication Error Factors, Safety Guideline System, Flow of Drug Usage, and Code of Conduct to Prevent Medication Error

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ABSTRACT

Medication error is any preventable event that may lead inappropriate drug service to patient, although administered by the healthcare professional. This study aimed to analyze the factor that may lead the medication error and identify the medication error solution to pharmaceutical installation in Indonesian hospital. The research subjects were doctor, pharmacist, pharmaceutical engineering personnel and nurses. Action research was including : diagnosis, reconnaissance, action plan, action, evaluation and monitoring the subject. Diagnosis were obtained from primary and secondary data. Primary data were obtained by interview, observation, and Focus Group Discussion (FGD). Secondary data were obtained from adverse event and near-miss events in medication error data in pharmacy installation. The results indicated that there were four major factor of medication error. First, prescribing error is an unclear written prescription, incomplete administration, and unavailable prescription. Second, transcribe error is a misread of prescription drug that lead to mistreatment. Third, dispensing error is involved the misread of prescription drug by pharmacist, wrong dose, wrong quantity, and incompetent pharmacist personnel. Fourth, administration error is an incorrect administration by hospital personnel. In conclusion, the establishment of safety guideline is important to medication error in pharmaceutical installation. The safety guidelines consist of the policy and standard operational procedure, flowchart of outpatient service, code of conduct of pharmacy safety and monitoring to ensure the quality of medical service.

Keywords: *Drug administration error, medication error, patient safety, pharmaceutical installation*

INTRODUCTION

A hospital is a necessity compliance of the patients that need to improve their services quality. Health services are any activities and or integrated and sustainable of activities to maintain and improve the health, treatment, health recovery by government or community [1]. Customers are a vital factor of public services. The focus of health and hospital services is the safety of the patient. Two vital points should be noted to providing the patient the satisfaction and safety. Health services are prosecuted for providing satisfaction and safe guaranteed services. The management system includes risk identification, risk analysis, evaluation, handling and continuous monitoring and communica-

tion. The managementsystem is important to prevent the dangerous occurrences and patient injuries [2].

Recent studies revealed that about 251,000 patients per year are died in the United States caused by medical error that be a third most causal of mortality cases [3]. In Indonesia, the related issues of patient safety have been discussed since 2000, followed by 4,500 of medical record. The result showed that total of adverse events widely varies i.e. 8.0%-98.2% from diagnosis error and 4.1%-91.6% from medication error [4]. National reporting system for patient safety incident stated that medication error is of the first rank from 10 of reported incidents. Percentage of medication error in the hospital related to error when giving the drug to the patient (wrong dose formulation or wrong drug) is

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11%. The frequency of pharmaceutical services errors is prescribing errors (54%) and drug delivery and inappropriate use error (46%) [3].

The study has been conducted in educational hospital type B with 416 beds and accredited by Hospital Accreditation Commission with plenary level. In 2016, the hospital has Bed Occupancy Ratio (BOR) 64.32 %. The result revealed that the incident of patient safety in the study site is quite high. Adverse events and near-miss events numbers caused by administration of drugs to patients is expected to decrease every year, nevertheless, this incident always happens many times. This study aimed to analyze the factor that may lead the medication error and identify the medication error solution to pharmaceutical installation in a research hospital in Indonesia.

MATERIALS AND METHODS

This study used an action research method. There are three requirements the research is categorized as action research including research, participation, and action. The subject of this study was all of the risks from prescribing events lead to medication error and all of the health staff involved in drug administration in the study site.

The informants included doctors, pharmacists, pharmaceutical engineering personnel and nurses from research hospital, Indonesia. The data are categorized as primary and secondary data. Interview, observation, and Focus Group Discussion (FGD) obtained primary data. While secondary data were obtained from adverse event and near-miss events in medication error data in pharmacy installation. Researchers have included themselves in the proses of pharmaceutical services during identifying causal factor.

RESULTS AND DISCUSSION

Action Research Process

In this study, action research involves six processes: diagnosis, reconnaissance, action plan, action, evaluation and monitoring the subject. The results of each detailed process are below:

1. Diagnose step

Adverse event and near-miss events caused by medical error is the most important issue which requires health service improvement for better hospital quality.

2. Reconnaissance

This step was done by identifying problems with interviews, observations, FGDs, and hospital document

review. Interviews were conducted with the research subjects: doctor, chief of pharmacy, head of Depo Pharmacy Outpatient, head of Depo Pharmacy Inpatient, head of Depo Pharmacy Installation of Central Surgery, head of Depo Pharmacy Emergency Department, a delegation of Pharmaceutical Engineering from each depo, and nurses in a research hospital, Indonesia. Interviews were conducted to collect information about the incident in pharmaceutical installations. FGD conducted with the involvement of the Director and Deputy Director of Human Resources (HR), Deputy of the Head of Training, Head of Service & Medical Support, Head of Medical Support Staff, Head of Pharmacy, Head of Depo Pharmacy Inpatient & Outpatient, and Vice Chairman of Safety Committee Hospital. FGD is performed to determine the selected problem and inputs about the adverse event and near-miss events in medical error. Observation includes pharmaceutical facilities and infrastructure, prescription submission by patients, waiting for a prescription, prescription administration, drug preparation, labeling, and drug delivery to patients. Observation were conducted in four areas, included Emergency department (ER), Outpatient pharmacy service, inpatient pharmacy service, and Surgery room pharmacy service. Observations carried out for 5 to 6 hours for 4 weeks in each area. Document review includes all documents about tasks, principle and function of pharmacy installation, pharmacy installation profiles, service procedures and other related documents.

Identification of the root cause of the problem was used fishbone or Ishikawa diagram. This diagram visually displays the problem sources and identify the root cause of the problem. Fishbone Diagrams or Fish Bone Charts is an analysis developed by Dr. Kaoru Ishikawa who describes the problems and causes in a skeleton of fish bones. The concept of a fishbone diagram is a fundamental problem that placed on the head of fishbone skeleton [5]. The cause of the problem is described on the fins and thorns. The categories of problem causes are grouped into four factors: officers, methods, tools, and environment.

Medication error occur in four stages: prescribing error, transcribing error, dispensing error, and administration error. Prescribing error, wherein the selection of a drug is incorrect because ambiguous prescription factor, abbreviated drug name, and incomplete patient information. Transcribing error factor include misread and less precise in translating the prescription because the badly written prescription. Dispensing error occur

because incorrect written information on drug label, labelling errors, wrong drug, wrong dose, and Incorrect preparation of the drug. Administration error occur when the pharmacist do not carry out a final check before administering the drug to the patients because the incompetent pharmacist (human error) and patient are in hurry.

3. Action plan

An action plan is a detailed plan about what steps must be taken to resolve the problem, who will implement in service improvements and the solution impacts [6]. The brainstorming and discussions with the research hospital crew were created a medical error solution. The solution is about the guideline of patient safety and prescription system at Pharmacy Installation of a research hospital, Indonesia.

This guideline includes the preparation of rules, definitions, procedures and stages of prescribing services, prescription translation, preparation and dispensing of a drug, delivery the drug to a patient, safety procedures in the prescribing service, prescribing flowchart services, and safety code of conduct for pharmaceutical installations.

4. Action step

The preparation of safety guidelines system on prescribing services include the rules, definitions, procedures and prescribing service step, prescription translation, preparation and dispensing the drug, patient delivery, safety procedures in prescribing services, prescribing flowchart services, and safety code of conduct stage for pharmaceutical installations. Each of the new service flowcharts at prescribing stage is carried out the double checklist procedures and safety roles to prevent the mistake about prescriptions receipt, drug preparation, and delivery the drugs to patients.

The procedures were created for improvement the prescribing services, service flowchart establishment and safety icons in Pharmacy Installation of a research hospital, Indonesia. Safety roles are created to eliminate the risk of error or inaccuracy while performing prescribing services. Patients who understand the communication, information and education concept should provide the agreement form to the pharmacist. The next guidelines are socialization of prescribing safety service to the personnel of pharmacy installations and related units involved in drug delivery. Patient safety icons were created to make it easy to remember for each hospital personnel. The code of conduct SAFETY was described in Table 1.

Table 1. Code of conduct SAFETY

<i>Safety</i>	<i>Ethical Behavior</i>
S: SAFE	1. Make sure the patient identification is correct
Personnel service according to SOP and safety guidelines for patient.	2. Confirm to the doctor
	3. Provide education until the patient understands
	4. Make sure whether the patient is risk of falling
	5. Make sure to ask about allergic condition
	6. Perform 7 correct step in pharmacy installation
A: SAFE	
Personnel service according to SOP and safety guidelines for patient.	1. Double re-check with personnel who have the same competence
	2. Fill out the checklist
	1. Complete one job first until finished
F: FOCUS	2. Don't occupy the job
The personnel focus on patient-oriented services.	3. Do the job seriously
	4. Listen carefully the patient complaints
	5. Answer the patient question well
E: EFFECTIVE	
The personnel perform the best service with best target, appropriate management and benefits	1. Explain briefly and straightforwardly to the patients
	2. Use drugs rationally
T: REVIEW	
The personnel always review the flow of services	Review each incident that is not in accordance with the provisions
Y: SURE	1. Sure that the patient has

<i>Safety</i>	<i>Ethical Behavior</i>
Be assured that the services performed by the staff are consecutive and safe.	been understood the information 2. Sure that the personnel give the best service

5. Evaluation step

The evaluation step of prescribing has been accepted and carried out in accordance with the existing steps. There are several stages that are not fully implemented because it needs the additional pharmacist contribution in a research hospital, Indonesia. The proposed educational columns are not yet fully applicable because it is needed for adaptation with new designs, limited personnel who educate patients and hasty patient factors when receiving prescriptions. Pharmaceutical icons are manifested in the form of a desk banner that is placed in a pharmaceutical installation so that staff always perform patient safety services.

This medication error in the study site has occurred in the 4th phase including prescribing error, transcribing error, dispensing error and administration error [3]. In the prescribing error, the factors that affect the medication error are unclear prescribing, abbreviated drug names, incomplete administration in term incomplete patient identity. An unclear prescription from the doctor makes it more difficult for pharmacist moreover if drug prescription writing has the similar name.

In transcribing error the factors that lead to medication error is misreading and less accurate when translating the prescription. This condition same with previous research by Simamora stated that error in the case of translation of prescription is 11,6%. A dispensing error occurred due to staff error in delivering the drug, wrong dose and wrong supply caused inappropriate with drug request. This fatal error is caused by the incompetence or human error. This error is detected after the pharmacist reexamine the prescription. Otherwise, this result contrast with the Budiono research who stated that error in the dispensing caused by incomplete of drug information (2.18%) [10].

Administration error is caused by the staff who do not do overall re-checking because of their error. Furthermore, the other causal factor is hurried patient due to the long waiting queue. Beside that rapid delivery of the drug to the patient lead to accumulation of drugs that have been finished and not immediately given is

also a factor error in drug delivery [11]. In this study site, the incidence of drug delivery error is much happening in outpatient unit caused by drug delivery directly to the patient did not involve the nurse.

Writing the guideline book is a good way to prevent medication error. Guideline book is made with more emphasis on minimizing errors or errors in prescribing services. The guidebook includes policy maker, definitions, procedures and stages of prescribing services from the prescribing stage, translate recipe, preparing and dispensing phases, drug delivery to a patient, safety procedures in prescribing services, a flowchart of prescribing services. Beside that safety icon for pharmacy installation need to be written. Safety icon for pharmacy installation including of prescription safe data, safe categories of patients, safe etiquette, secure dispensing, safe distribution, and secure information.

A guideline book is important to sustainable safety culture of hospital personnel. In accordance with [12], safety culture requires a strong leadership followed with the involvement and strengthening of all staff. The effective solution for dispensing error is policy or rules. The new procedure requires an adjustment and adaptation of human resources and positive feedback from hospital personnel.

Medication error occurring in the hospital may happen in each stage of prescribing services and this error can affect to next prescribing stage until can threaten the patient safety [13]. It is time for Hospital to apply the computerized prescription system [14]. Furthermore, reducing the incidence of drug delivery errors can also be initiated from guidance, service flow, and changes in procedures and methods according to hospital conditions.

One of the best solutions to prevent the medication error is double check (two man rule/double verification principle). The suggested flowchart present every step of drug use and safety efforts in each service step indicated in yellow shade.

PMK No. 11 (2017) explains that building the awareness of patient's safety value and supporting the staff in patient safety implementation are important thing for creating the patient safety culture. The implementation of safety culture which is the basic value can be realized in code of conduct. Code of conduct is a proposal to the management and officers at hospital [9].

Code of conduct contains the ethical behavior of the hospital personnel to responsible and safety ser-

vices implementation both for patient and hospital personnel themselves. Code of conduct usually use the simple language and easily accepted by the hospital personnel. Preparation of code of conduct aimed to make it easier and more comfortable to implement the safety culture value during the service. Safety is not only for patient but also for hospital personnel.

CONCLUSION

In conclusion, the establishment of safety guideline is important to a medication error in pharmaceutical installation. The safety guidelines consist of the policy and standard operational procedure, flowchart of out-patient service, and code of conduct of pharmacy safety. The suggestion for the research hospital is apply the computerized prescribing system using safety guideline system for drug use. The hospital management may legitimize and establish the guideline with the code of conduct. Further monitoring and evaluation is important to ensure the service quality of the hospital.

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