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Review Article

Medication Error: An Overview

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Abstract

Medication is prescribed by health-care professional who is mostly used to treat and cure a disease or illness as well as to treat any medical condition. For example, antibiotics are given to cure a bacterial infection, analgesics to relieve pain. However, an error of medication may occur at any point during the medication use process and in any setting. Medication errors are adverse effects that can be prevented and can be defined as a failure in the treatment process that leads to or has the potential to harm the patient. The health-care professional especially the staff nurse holds the responsibility of serving medication should always be aware and alert when giving medication to the patient. Registered nurses have a key role in discovering and correcting medication errors. According to Hariati Johari (2017), in the Journal of Nursing and Health Science mentioned that patient safety is a common goal for every health-care provider and one of the major issues for safety is medication error. As a nurse, we should avoid the occurrence of medication errors to prevent serious damage and adverse effect on the patient. Medication errors are the single most preventable cause of harm to the patient. They are committed by doctors, pharmacists, nurses, caregivers, manufacturers, and the patient itself. Such events may be related to professional practice, health-care products, procedures, and systems, including prescribing, order communication, product labeling, packaging, and nomenclature, compounding, dispensing, distribution, administration, education, monitoring, and use (Samsiah *et al*., 2016).

Keywords: Medication error, Prescription, Patient safety

Introduction

Medication errors are most common at the ordering or prescribing stage. Typical errors include the healthcare provider writing the wrong medication, wrong route or dose, or the wrong frequency. These ordering errors account for almost 50% of medication errors. Data show that nurses and pharmacists identify anywhere from 30% to 70% of medication-ordering errors. It is obvious that medication errors are a pervasive problem, but in the majority of cases, the problem is preventable.[1]

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Occurrence of Medication Errors

Medication errors can occur at many steps in patient care, from the point of ordering the medication to the time when the patient is administered the drug. In general, medication errors, usually, occur at one of these points such as ordering/prescribing, documenting, transcribing, dispensing, administering, and monitoring.[2]

Types of Medication Errors

According to Medcom Trainex (2015), medication errors can occur anywhere along the route, from the clinician who prescribes the medication to the healthcare and the professional who administers the medication. Medication errors in the transcribing step always happen because of poor handwriting, placing a wrong decimal, misused abbreviations, and errors while calculating the dosage of

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the drugs. There are four categories of medication errors. Knowledge-based errors: Knowledge-based errors can be related to any type of knowledge, general, specific, or expert. It is general knowledge that penicillin can cause allergic reactions; knowing that your patient is allergic to penicillin is specific knowledge; and knowing that ampicillin contains penicillin is expert knowledge. Action-based errors: Defines the performance of an action that was not what was intended. Action-based medication errors are what most nurses think of when the term medication error is administering an incorrect dose or giving a patient the wrong medication. Rule-based errors: Rule-based medication errors happen because the nurse did not follow proper rules or procedures for medication administration. Examples could include a good rule that was not applied (e.g., checking with another nurse when performing a dose calculation for a risk drug such as insulin), or the application of a bad rule (e.g., the health-care facility does not require nurses to double-check dose calculations for high-risk drugs). Memory-based errors: Memory-based medications errors happen when the nurse simply forgets to perform a task or forgets important information about the patient.[3] The nurse may forget to give a dose of a medication, may forget that the medication has been discontinued, or forget that the patient is allergic to the medication. All of these errors (knowledge, rule, action, and memory) have also been classified as active errors. However, medication errors can also occur because of what has been termed latent errors. Latent errors might be considered system or institutional errors. The most important factors that can be effective on the medication errors in nurses are: Fatigue due to high workload, a large number of critically ill patients, doctor's damaged and unreadable orders, and the low nurse:patient ratio. The most important causes of medication errors in nurses were staff deficiency, fatigue due to high workload, and high workload in the wards (Hosseinzadeh and Aghajari, 2012). Rama (2010) found that dispensing errors account for 21% of all medication errors. Dispensing errors are deviations from the prescription order such as dispensing the wrong drug, wrong dosage, preparation, packaging, and incorrect or confusing direction of use and storage of the medication. Administration errors always occur wherein the clinician or healthcare provider administering medication with the wrong technique, for example, a nurse administering medication intravenously instead of orally.

Factors Affecting Medication Errors

Medication errors can happen to anyone in any place such as a hospital, clinic, and pharmacy. Based on research conducted by Ali *et al.* (2013) reported that inadequate pharmacological knowledge was one of the human factors associated with a medication error. Therefore, nurses are required to update their pharmacological knowledge especially new drugs as a strategy to reduce serious medication errors.[4] Furthermore, based on American nurse today (2015), one of the factors affecting medication errors is environmental factors include inadequate lighting, cluttered work environment, increased patient acuity, distraction during drug preparation or administration, and caregiver fatigue. Distractions and interruptions can disrupt the clinician's focus that leading to serious mistakes. A heavier workload is also one of the factors that can lead to medication errors. The nursing shortage has increased workloads by increasing the number of patients for which the nurse is responsible. Furthermore, nurses perform many tasks that take them away from the patient's bedside. The absence of the nurses from the bedside is directly linked to compromised patient care. Other than that, incomplete patient information also causes medication errors. Pecci (2018) in Health Leaders journal said patient data can provide information to the physician. Some physicians or nurses lacking information about which medications a patient is allergic to, other medication taking by the patient, previous diagnosis, and current lab results can all lead to medication errors. Lack of communication also can lead to medication errors. Many medication errors occur caused by miscommunication among doctors, pharmacists, and nurses. Communication barriers should be avoided and drug information must always be verified. Good communication with the doctor, pharmacist, and nurses can reduce the risk of medication errors. Communications must always involve both parties and if in doubt about medicine, ask until the answer is satisfactory. Another factor contributing to drug errors is misleading drug labeling and drug packaging. Packaging for many drugs look similar. It has a high potential for causing medication errors.[5] Look-alike and sound-alike medications also can be confused because the names look alike and sound alike. Other factors associated with patients include patient characteristics (e.g., personality, literacy, and language barriers) and complexity of the clinical case, including multiple health conditions, polypharmacy, and high-risk medications.

Implication of Medication Errors

The Implication for patients

Medication errors can cause severe physical injury, deformity, increasing in the duration of hospitalization, and life-threatening leading to death. Medication errors are reported as the third leading cause of death after heart diseases and cancer.

The Implication for healthcare providers

Health-care providers who inadvertently give the wrong drug to patients or experience a near miss could suffer from shame, feel guilty, loss of confidence, and self-doubt. The nurses involved also will be scared of being scolded by the nurse supervisor due to the mistakes and may fear going back to work because of feel embarrassed to face other colleagues. Besides that, serious medication errors can cause healthcare to lose its carrier. Medication errors often lead to medical malpractice. On the other hand, if a nurse or other health-care provider administers a wrong medication that results in serious side effects such as injury and death, the patient can sue the nurse and may also sue

the doctors, pharmacist, and hospital. Furthermore, nurses who make medication errors can cause disciplinary action by the board of nursing, job dismissal, mental anguish, and possible civil or criminal charges. American Nurses Today (2017) reported that the health-care providers who experience the medication errors felt immobilized, nervous, fearful, and experienced insomnia that can lead to serious mental problems and commit suicide. The implication for hospital or institution: Patient or family members of the patient may file personal injury claims not only on health-care personal but also the health-care institution in which health-care providers are employed. In these cases, the hospital has to bear the loss of credibility and productivity from the staff involved in the medication errors. The hospital also has to bear a financial cost and treatment cost to the patient who is a victim of the serious complications of drug errors. Besides, it may take time to address medication errors, investigations, medical litigations, and settlement.[6] The hospital management team may need to spend a lot of time and cost to investigate and modify policies to reducing future errors. Drug errors also may affect the hospital or institution's reputation and may affect the accreditation before. Cumulative medication errors could also affect the hospital's reputation and re-accreditation.[6] Various tools can be used to assess the medication errors in clinical settings[7] [Table 1].

Table 1 depicts the overview of the tools to assess the medication errors in clinical settings.

Prevention of Medication Errors

Medication errors have important implications for patient safety, and their identification is the main target in improving clinical practice errors, to prevent adverse events. Medication errors and drug-related adverse events have important implications from an increasing length of hospitalization costs to undue discomfort and disability or increased mortality.[7] To build safety for the patient and reduce the medication errors event, nurses must ensure 10 rights – right drug, right dose, right patient, right route, right time and frequency, right history and assessment, right to refuse, the right education, right evaluation, and right documentation.[8] Nurses need access to accurate, current, readily available drug information, whether the information comes from computerized drug information systems, order sets, text references, or patient profiles. Furthermore, nurses also must follow proper medication reconciliation procedures. Institutions must have mechanisms in place for medication reconciliation when transferring a patient from one institution to the next or from one unit to the next in the same institution. Review and verify each medication for the correct medication, correct dosage, correct route, and correct time against the transfer documents. Accurate documentation is essential and should include accurate recording of the drug information, the name of the drug, the dose, route, time, patient response, and any refusal of the drug by the patient.[9,10] Besides, nurses also need to double-check or even triple check before administering drugs to the patient. Based on a cross-sectional survey on nurse's experiences of medication double-checking procedures in clinical practice, conducted by Schawappah *et al.* (2016) stated that double-checking is widely recommended as an essential method to prevent medication errors. This research founded that 80 percent of the nurses say that internal guidelines were explaining which checks were required for which medications and the nurses know them well. The researcher believed that medication mistakes could have been prevented and avoided by applying double and triple check before administering medication. Error prevention can be planned employing retroactive and proactive tools, such as audit and failure mode, effect, and criticality analysis. The audit is also an educational activity, which promotes high-quality care; it should be carried out regularly. In an audit cycle, we can compare what is actually done against reference standards and put in place corrective actions to improve the performances of individuals and systems.

Table 1: Tools used to assess the medication errors

Tool	Name	Purpose
1	An assessment of medication use processes	To guide the organization in assessing the processes involved in the delivery of medications and the need for support from technology
2	Medication error tracking form	To facilitate the collection of data on medication errors in the organization
3	Medication error reporting form	To identify major sources of errors within and across the departments
4	A checklist for preparing the organization	To outline overall implementation steps and record progress
5	A guide to potential IT solutions to medication error	To help the organization identify the IT modules that are best suited to its specific problem areas
6	Pros and cons of IT options	To guide the evaluation and selection of technologies
7	Needs assessment and product evaluation	To summarize and stratify technology. Features for purpose of assessing organizational needs and to facilitate comparisons of features among vendors post-RFP process

Conclusion

Nurses and all health-care providers should ensure that the "right patient" received the "right drug." Health-care professionals must work together to develop a systematic approach to the medication process in reducing and preventing medication errors. All health-care professionals wherein involved in the medication use process should be monitored with each other to achieve the objective and mission to improve the services and safety for patients.

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