FACTORS AFFECTING MEDICATION ERRORS BY NURSE IN HOSPITAL

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ABSTRACT
Introduction: Medication error is one important indicator of patient safety and commonly occurs in health care. Many things can cause medication error happens. The purpose of this study was to determine the factors affecting medication errors made by nurses in hospital care.  
Methods: The database used in this study was Google Scholar, ProQuest, Scopus, Science Direct, PubMed, Medline, Springerlink and Elsevier with limitation of publication time in 2011-2016.  
Results: Based on journals which has been reviewed, there was two dominant factors affecting medication error made by nurses. Those factors were individual factor such as knowledge and environmental factor such as workload factor.  
Conclusion: Factors affecting medication errors made by nurses are divided into internal factors and external factors.  

Keywords: medication error, nurse, factor.

INTRODUCTION  
Patient safety is an important aspect of a health care. One indicator of patient safety is drug administration safety which is expected no errors in it or commonly known as medication errors. Medication error has fatal effects for the patient. Therefore, medication errors become very considered in health care.  

Minister of Health Decree No. 1027/Menkes/SK/IX/2004, mentioned that medication errors are an adverse event, due to the use of drugs during the treatment by health workers, which previously could have been prevented. Medication error is an event that can cause improper drug administration or harm to the patient while the medication under supervision of health workers or patients (NCC MERP, 2012).  

The occurrence of medication errors need to be analyzed more deeply because it involves some health workers include doctors as determinant of pharmaceutical therapy of patient, pharmacist as provider of drugs, and nurse who involved in drug administration to the patient. In addition, there is also several steps in the process of drugs distribution to patient which is starting from prescribing, dispensing (preparation), and drug administration. An error in one step in can cause errors in the next steps. The incidence of medication errors is related to practitioners, drug products, environmental procedures, or systems that involve those steps.

William within Muladi (2012) mentioned that the incidence of medication errors is quite varied. Institute of Medicine (IOM) reported about 44000-98000 people died and about 7,000 people a year in the United States die due to medication errors. The incidence of medication errors between 2-14% of patients with 1-2% which led to the loss of patients, most commonly due to wrong prescription. While the incidence rate of medication errors in Indonesia was reported about 3-6.9% in hospitalized patients. An error in prescription process varies between 0.03 to 16.9%. One of the researchers mentioned about 11% of medication errors in hospital associated with the error when administer a drug to the patient, either because of wrong dosage or wrong drugs. There is no accurate and systematic data in Indonesia. Medication
errors are common but rarely end up with patient injury (Dwiprahasto, 2006).

Leape, et al (1995) has identified the causes of medication errors include: lack of knowledge, especially doctors who are the cause of that incident (22%); inadequate information, 14% of the errors about the patient such as laboratory test; not following the SOP drug administration which is errors in determining dose (10%); forget (9%); errors in reading prescription such as unreadable writing, prescription interpretation, and abbreviation in prescription; understanding verbal commands incorrectly; labeling and packaging; poor stock and storage of drugs; problems with standards and distribution; poor assessment of tools using in administer drugs; work related stress; and ignorance of the patient.

Collaboration between practitioners of medication error prevention program is required by a multidisciplinary team to prevent medication errors because this frequently occurs, but not revealed and almost no effort to prevent it (Carlos, et al, 2013).

METHODS
This study was used systematic review method. Source of research data is derived from the literature from internet especially scientific articles published in national and international journals. Topic selection and determination of keyword performed before researcher search online scientific articles. Determination of keywords is based on PICOT framework (P: nurse, I: -, C: -, O: medication errors, T: 2010-2016). The database used in this study was Google Scholar, ProQuest, Scopus, Science Direct, PubMed, Medline, Springerlink and Elsevier. Keywords to search literature included "factor", "nurse" and "medication error". Then, scope of the article searches narrowed based on inclusion criteria, that is research about factors affecting medication errors by nurse in hospital and research that using primary data, so that researcher got 15 articles that will be used as a reference. These 15 articles are included within journal of application.

The purpose of this study was to determine factors affecting medication error by nurse in hospital. Data were collected through the study of scientific articles literature from national and international journals. Data were analyzed by using content analysis with sorting the results of study into thematic categories based on common characteristics. Then, each thematic category will be analyzed to determine the relationship patterns of dominant factors affecting medication errors by nurse.

RESULTS
Based on the univariate analysis results in article literature, it is known that the research about factors affecting medication errors by nurse is commonly investigated by researchers outside of Indonesia. There was 4 of 15 scientific articles which examine individual factors, 4 articles examine environmental factors, and 7 articles examine both of those factors.

The number of samples used for the study was 70-1300 people. Researcher used qualitative, descriptive, and cross-sectional design. This is due to the lack of research about factors affecting medication errors by nurse.

The literature used in several scientific articles about 18-213 literature, either from books, health bulletins, health and non-health journals, thesis, or dissertation. There are no literature using Indonesian due to the lack of literature about these topic in Indonesia. This is related to the lack of accurate data about medication errors in Indonesia. So the percentage of using international journal literature is 100%. Most of English literature use references from international journals. Factors affecting the lack of references from international journals in Indonesian reference are limited number of researchers in accessing international journals.
The instruments which used by researcher to identify factors related to medication errors has been tested the validity and reliability before use, its value about 70%. One of the instruments which used to measure medication errors is questionnaire of the Medication Administration Errors Reporting (MAERs) according to Beharu et al. This instrument is measurable, another study using a modified questionnaire with validity and reliability test so that results of research can be credible. As many as 30% did not mention details of the questionnaire used.

Based on the distribution of the references, it is known that the literature used partly derived from scientific articles from various international journals. Only one study which use dissertation as a research base. Use of literature can be used in measuring the quality of a study. One of good research criteria is the use of current journals in large quantities as a basic for research. Based on attachment table, most research uses many scientific articles from journals. This showed that scientific articles have a good quality viewed from the literature utilization aspect. This study was development of previous studies without creating new findings within management field, especially the topic of medication errors.

Table 1. Distribution of factors affecting medication errors by nurse.

<table>
<thead>
<tr>
<th>Researcher</th>
<th>Factors Affecting Medication Error</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ya-Hui Lan, et al. 2014</td>
<td>Knowledge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hung, 2011</td>
<td>Nursing skill</td>
<td></td>
<td>Size of work unit</td>
</tr>
<tr>
<td>Tamayo Kazaoka, et al. 2011</td>
<td>1. The way to deliver information 2. Drugs demand by nurse leader approved by clinical 3. Interpersonal communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Akram Shahrokhi, et al. 2013</td>
<td>1. Nurse less cautious 2. Errors in documentation of prescription</td>
<td></td>
<td>Heavy workload of nurse</td>
</tr>
<tr>
<td>Seyyedeh Roghayeh Ehsani, et al. 2013</td>
<td>The use of patients nickname</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foad Rahimi, et al. 2015</td>
<td>Workload</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jones, 2010</td>
<td>Nurse did not perform the 5 Right principles</td>
<td></td>
<td>1. Doctor’s handwriting in prescription chart 2. Verbal command is not clear 3. RN : Patient ratio 4. Lack of nurse staff</td>
</tr>
<tr>
<td>Berhanu Boru Biffitu, et al, 2016</td>
<td>Education status</td>
<td></td>
<td>Over time</td>
</tr>
<tr>
<td>Senafikish Amsalu Feleke, et al, 2015</td>
<td>Work experience</td>
<td></td>
<td>Night shift</td>
</tr>
<tr>
<td>Kim Sears, et al, 2016</td>
<td>1. Nurse experience 2. Education</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Several factors affecting medication error by nurse in hospital include fatigue, knowledge, depression and other factors.

DISCUSSION

Based on Table 1, researcher divided the factors affecting medication errors into two parts, that is individual factors and environmental factors.

Based on Table 1, it is known that the environmental factors become factor that most commonly researched and most affecting medication errors than individual factors. Individual factors affecting medication errors is knowledge factor either related to the science of pharmacology or drug dose calculations especially in pediatric and infant patient as which is consistent with Bjorg, et al. Other individual factors are experience, experience also have an influence on the incidence of medication errors.

According to Kim, et al nurse who have so much experience would be less make mistakes because they already have much more knowledge about drugs. In addition, fatigue and depression factors can cause a lack of concentration at work so that medication errors will occurs more easily. Less attention to the patient and less discipline also becomes cause of medication errors. This frequently occurs because nurse feels that administer drugs is a routine activity so that nurse considers it is easy job. In addition to those factors, difficulties in reading prescription are also commonly experienced by nurse.

Writing of the drugs name, dosage amount, and abbreviations which is not appropriate with standard commonly make the nurse becomes confused and can cause errors. There was a difference of opinion about educational background factors. According to Kim, the educational background has effect on medication errors because it is related to the nurse knowledge. The higher educational background will make nurse get more knowledge. Meanwhile, according to Chang-Hung Chiao, the background has no effect because what is needed is knowledge related to drug or pharmacological better. While, according to Chang-Hung Chiao, the educational background has no effect because things that really needed is better knowledge about drug or pharmacology.

Based on environmental or external factors, factor that most commonly researched is the workload factor. In addition, other external factor is communication, errors in identifying patients, wrong drug storage, and night shift. Communication factor which is defined in this article is interpersonal communication. According to Kazaoka, et al. good communication within the team can reduce the workload of nurse so that influenced the medication errors.

An error in identifying patients which is defined here is that there is nurse who did not performed patient identification before drug administration. Nurse thinks that they already know the patient because they ever taking care of those patients before. However, this may cause an error if there is a change in drugs. Night shift also become an influential environmental factor, according to Senafikish, during night shift focus of nurses within work tends to decrease so this shift at high risk of medication error events.

CONCLUSION AND RECOMMENDATION

Conclusion

Based on discussion above, it can be concluded that factors affecting medication errors by nurse were individual factor included knowledge, experience, fatigue, depression, lack of attention and discipline, and difficulty in read doctor's prescription. While environmental factors consist of nurses’ workload, communication, errors in patient identification, wrong drug storage, and night shift.

Recommendation

Public expectations about excellent health services in global era will continue to change as people continues to growing and
changing. In addition, the demands of accreditation which makes patient safety as spearheading of quality within nursing services are also requires health services to maintain reputation of the institution. Similarly, in nursing service, people want qualified nursing care. Medication errors is one indicator that frequently occurs, but The occurrence of medication errors need to be analyzed more deeply because it involves some health workers include doctors as determinant of pharmaceutical therapy of patient, pharmacist as provider of drugs, and nurse who involved in drug administration to the patient. In addition, there is also several steps in the process of drugs distribution to patient which is starting from prescribing, dispensing (preparation), and drug administration. An errors in one step in can cause errors in the next steps. The incidence of medication errors is related to practitioners, drug products, environmental procedures, or systems that involve those steps.

commonly unnoticed, especially nursing in Indonesia. Considering the importance of this case, it is expected that there is a change in nursing field within health care to provide relevant knowledge of pharmacology through in-house training activities either from service providers or pharmaceutical companies. In addition, it is also necessary for the manager of nursing to improve efforts in reducing medication errors made by nurse. Nurses can creating discipline culture and identifying workload so that medication errors can be reduced significantly. Data collection accurately related to medication errors are also expected to be implemented by health care providers as a benchmark for further research services and utilities.

REFERENCE


