



## แนวปฏิบัติในการบริหารจัดการยา: การยึดมั่นในแนวปฏิบัติของพยาบาล

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### บทคัดย่อ

การบริหารยาเป็นงานส่วนใหญ่ที่พยาบาลปฏิบัติการ จำเป็นต้องใช้ทักษะ เทคนิค และความรู้ในการปฏิบัติ เพื่อให้เกิดความปลอดภัยแก่ผู้ป่วย หรือผู้รับบริการ ในกรณีศึกษาวิจัยในครั้งนี้ เป็นการวิจัยเชิงพรรณนาที่มีวัตถุประสงค์ เพื่อศึกษาการปฏิบัติการให้ยาของพยาบาลตามหลักการบริหารยา 6 โดยกลุ่มตัวอย่างของกรณีศึกษาวิจัยในครั้งนี้ เป็นพยาบาลจำนวน 123 คน สุ่มตัวอย่างจากโรงพยาบาล 4 แห่ง ในยogyakarta ประเทศอินโดนีเซีย ดำเนินการเก็บรวบรวมข้อมูลโดยใช้แบบสอบถามการบริหารยาเป็นแบบประเมินค่า 5 ระดับ พัฒนาโดยผู้วิจัยผลการศึกษาพบว่า ข้อมูลของกลุ่มตัวอย่างเป็นพยาบาลจำนวน 123 ราย ส่วนใหญ่เป็นเพศหญิง มีอายุเฉลี่ยประมาณ 34 ปี ได้รับประกาศนียบัตรวิชาชีพชั้นสูงทางการพยาบาล และมีประสบการณ์การทำงานเฉลี่ยมากกว่า 6 ปี โดยผู้เข้าร่วมโครงการวิจัยส่วนใหญ่ร้อยละ 78.1 ตามขั้นตอน “รูปแบบของการตรวจสอบยา” ในขณะเดียวกันจากผลการวิจัย พบร่วมกับพยาบาลที่ให้ยาผู้ป่วยเป็นผู้เตรียมยาให้ผู้ป่วยด้วยตนเองเพียงร้อยละ 8.9 และพยาบาลมากกว่าร้อยละ 50 มีการตรวจสอบความถูกต้องของผู้ที่จะรับยา และความถูกต้องของยาบันทึกการให้ยาแก่ผู้ป่วยโดยการเตรียมยาด้วยตนเองเพื่อให้เกิดความปลอดภัยแก่ผู้ป่วย โดยเฉพาะการให้ยาแก่ผู้ป่วยโดยการเตรียมยาด้วยตนเองเพื่อให้เกิดความปลอดภัยแก่ผู้ป่วย

**คำสำคัญ:** การบริหารจัดการยาความปลอดภัยในการให้ยาหลักการให้ยาอย่างถูกต้อง 6 ประการ

## Nurses' Adherence to Medication Administration Practice at Indonesian Public Hospitals

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### Abstract

Medication administration is a common nursing task which requires skills, techniques, and knowledge to ensure patient safety. The aim of this descriptive study was to explore nurses' adherence to foundation of medication administration (6 Rights). The study sample of 123 nurses was randomly recruited from four public hospitals in Yogyakarta, Indonesia. Data were collected by using a 5-point Likert scale questionnaire developed by the researcher. Mean age of participants was 34 years. The majority of participants was female, earned diploma degree, and had working experiences more than six years. Most of the participants (78.1%) were able to follow a medication checkup procedure. The lowest score of adherence behaviors was related to "administer medications if only prepared by self" in which only 8.9% of participants always followed this item. More than 50% of nurses identified patients before giving medications and checking the accuracy of nursing documentation. The recommendation from this study is that nurses should follow the guideline of medication administration, especially administering medications only if they are prepared by the nurse herself to ensure patient safety.

**Keywords:** medication administration, medication safety, nurses' adherence



## Introduction

Patient safety is an essential and vital component of quality care and as a foundation of effective patient care. One of patient safety goals that is appointed as a widespread and risk producing area of concern is medication safety<sup>1</sup>. It is also as a main aspect of patient safety in the 21<sup>st</sup> century global health care system, which is a complex stage process with multi-disciplinary approach and nurses play a key role<sup>2</sup>. Violation on medication safety practice caused by unsafe act of healthcare providers may lead to the incidence of medication errors that can affect the patient, the health care professional and the health care institution.

In United States, medication errors account for approximately 7,000 deaths annually and cost US \$77 billion to treat drug-related morbidity<sup>3</sup>. Unfortunately, nearly 40% of medication errors in the hospital occur during medication administration<sup>4</sup>.

Medication administration is a risky activity related to nursing practice, which requires good skills, techniques and knowledge. Nurses are primarily involved in medication administration and spend almost 40% of their time to perform this task<sup>5</sup>. Nurse is the last person who can check whether the prescription of medication is appropriate before it is administered to the patient<sup>6</sup>. This means that a nurse possesses the role in the occurrence of medication errors.

Through the book of *“Patient safety curriculum guide”*, World Health Organization<sup>7</sup> recommended a series of checklist to prevent medication errors, which is known as “The six (6) Rights”. This checklist is developed to be used by nurses during a medication administration process that can be applied simply with inexpensive cost and can be used as a basic standard guideline for “medication safety” practice. Continuous adherence to the medication guideline is perceived as a strategy to prevent the incidence of medication administration errors<sup>8</sup>.

In Indonesia, medication administration practice is based on hospitals’ Standard Operational Procedure (SOP) which comprises of six rights to prevent errors. However, data from one of public hospitals in Yogyakarta showed that there were 33 cases of medication errors reported in 2014. Three of those cases were closely related to nursing practice on medication administration: 1) Nurses forgot to give medications to the patient, 2) Medication administration

through an infusion pump was not given appropriately, and 3) Medication was not given in an appropriate dose. In fact, very few studies have been carried out on nurses’ adherence to medication administration practice, especially related to 6 R’s procedure in Indonesia. Thus, this study offers baseline knowledge which is useful for reducing medical administration errors which in turn to promote nursing outcomes.

## Objective of the study

The aim of this study was to explore nurses’ adherence to six rights medication administration practice at hospitals located in Yogyakarta, Indonesia.

## Material and method

**Study design and population:** Descriptive study was conducted in 123 public hospital nurses in Yogyakarta during December 2015-January 2016. Inclusion criteria were: 1) being a registered nurse (diploma or bachelor degree); 2) being actively on duty, not under maternity leave, or holidays; 3) working as a staff nurse (primary nurse or associate nurse); and 4) being willing to participate in this study. Exclusion criteria were: 1) being a head nurse or nurse manager, 2) working in a maternity ward, and 3) being in a training program. Midwifery nurses were excluded because their educational background and function were different from the study sample.

**Sample:** Disproportionate stratified random sampling was employed to recruit 123 nurses based on the eligibility criteria.

**Measurement:** Data were collected using the questionnaires developed by the researcher which consisted of a demographic data form and the medication administration practice questionnaire (MAPQ). MAPQ contained 24-items and used a five-point Likert scale for measurement which was related to behaviors of nurses during a medication administration process based on six rights principle. Interpretation was given by using cut off point of the overall mean score from 24 items of questionnaire and divided into two categories: “good practice” ( $> 104.98$ ), and “poor practice” ( $\leq 104.98$ ).

**Validity and reliability:** The MPAQ was examined for its appropriateness and content validity by five experts, including two experts from the Faculty of Nursing, Khon Kaen University and three experts from Indonesia (senior nurses). The content validity index of this questionnaire was 0.99.



The MPAQ was translated to Indonesian language and checked for its reliability by conducting a pilot study in 30 public hospital nurses. The reliability of the questionnaire was examined for its internal consistency, obtaining 0.88 of Cronbach's alpha coefficient ( $\alpha$ ) which indicates good internal consistency of the items.

**Data Analysis:** Data were analyzed by frequency, percentage, mean and standard deviation distributions. The Statistical Package for Social Sciences (SPSS) program 17.0 was used to analyse the data.

## Results

**Demographic Data:** Demographics characteristics of participants were shown in Table 1. Public hospital nurses in this study were dominated by female (74.8%) in middle aged (20 - 40 years old). The average age was 34 years old (S.D = 7.2). Majority of the participants had diploma degree (78.9%) and had been working for more than six years (60.2%). Only 31.7% of participants attended training programs related to patient safety. In addition, the participants had currently worked in one of the following wards: internal medicine wards, surgical wards, intensive care units, pediatric wards, and emergency room.

**Medication administration practice:** The participants were examined for their adherence on six rights of medication administration through the MPAQ questionnaire. The results showed that most of the participants (>50%) were able to "always" follow the procedure on the items of right patient and right documentation. There were five items (items 4, 6, 7 of right drug, items 2 and 3 of right time) on this variable which had been violated by some participants. Furthermore, the highest rank of violation (12.2%) was on the statement 7 (administer the medication only if prepared by self).

Statement 3 of right drug (check form of medication) had achieved the highest percentage of nurses' adherence (78.1%). Most of the participants were also able to "always" follow the procedure in statement 2 of right drug (tag/label of the syringe/ medication box).

**Table 1** Frequency and percentage of demographic data (n = 123)

Characteristics	n	%	Mean $\pm$ SD
Gender			
• Male	31	25.2	
• Female	92	74.8	
Age (years)			
• 20 – 30	47	38.2	
• 31 – 40	58	47.2	
• 41 – 50	17	13.8	33.7 $\pm$ 7.2
• > 51	1	0.8	
Education			
• Diploma	97	78.9	
• Baccalaureate	26	21.1	
Experience			
• 1 – 6	49	39.8	
• > 6 – 12	36	29.3	
• > 12 – 18	21	17.1	9.7 $\pm$ 6.8
• > 18	17	13.8	
Training			
• Yes	39	31.7	
• No	84	68.3	
Working area			
• Internal medicine wards	43	35.0	
• Surgical wards	32	26.0	
• Intensive care unit	13	10.6	
• Pediatric wards	26	21.1	
• Emergency room	9	7.3	

## Discussion

Participants' age may benefit the results of this study. The range of age between 20 and 40 is a young middle aged stage which is the highest development of physical conditions related to knowledge and skills<sup>10</sup>. This implies that this stage enables nurses in the level of good maturity and manhood and makes them able to apply their maximum competencies to optimize their medication administration practice.

Nurses are healthcare providers who are familiar with medication administration practice. They are responsible to deliver medications directly to the patients. When medications were not administered



properly, a nurse may be the first person who takes responsibilities. Therefore, nurses have to understand the procedure related to preparation, administration, dispensing, and monitoring during medication administration. Adherence on medication administration procedures is necessary to prevent medication errors to the patients.

As shown in Table 2, the items of medication administration practice questionnaire were presented

using percentage in which the results showed variations between items. The findings indicated that most of the nurses had shown their good levels of adherence to guideline (six rights). A study in Makasar, Indonesia also reported that majority of the nurses being assigned at inpatient wards had performed good practice related to implementation of 6 R's<sup>9</sup>.

**Table 2** Percentage of nurses' adherence to 24 items of six rights medication administration (n = 123)

Statement	(1)	(2)	(3)	(4)	(5)
<b>Right Drug</b>					
1. Check the medication's label and compare with prescription on medication record	0.0	0.0	4.1	26.8	69.1
2. Tag/ label the syringe/ IV drug/ medication's box with the patient's identity immediately during preparation	0.0	0.0	2.4	22.0	75.6
3. Check form of medication (tablet, suppository, syrup, ampule, etc) before administer it	0.0	0.0	1.6	20.3	78.1
4. Double check the medication name with another nurse	0.8	2.4	13.8	35.8	47.2
5. Check for patient's allergy of medication	0.0	0.8	7.3	34.2	57.7
6. Keep oral medication package (wrap) before administer it	2.4	0.8	9.0	31.7	56.1
7. Administer the medication only if prepared by self	12.2	11.4	34.2	33.3	8.9
8. Tell the action of medication to patient and the reason it is prescribed	0.0	1.6	6.5	43.9	48.0
9. Monitor the effect of medication on patient's condition (e.g., pain relief, assessment of blood glucose level, vital signs, urine output, etc.)	0.0	0.0	4.1	34.1	61.8
<b>Right Dose</b>					
1. Verify the amount of medication compared to prescription on medication record	0.0	0.8	4.9	31.7	62.6
2. Double check the amount of medication with another nurse	0.0	1.6	16.3	50.4	31.7
<b>Right Route</b>					
1. Read the medication route indicated on medication's label compared to prescription on medication record	0.0	0.0	8.1	40.7	51.2
2. Double check the medication route with another nurse	0.0	0.0	22.8	49.6	27.6
3. Confirm that the patient can take or receive the medication by ordered route	0.0	0.8	8.1	48.8	42.3
<b>Right Time</b>					
1. Prepare the medication not longer than 1 hour before administration	0.0	2.4	8.1	48.8	40.7
2. Label the IV infusion medication with time estimation to be finished	8.1	4.0	22.8	36.6	28.5
3. Administer the medication on scheduled time or not more than 30 minutes later/ earlier.	1.6	3.2	12.2	47.2	35.8
4. Confirm when the last dose was given to the patient	0.0	0.0	15.4	48.0	36.6
<b>Right Patient</b>					
1. Read the name of the patient on the wristband worn by the patient	0.0	0.0	1.6	24.4	74.0
2. Ask the patient/ attendance to confirm patient's name	0.0	0.0	2.4	30.1	67.5
3. Read the name of the patient indicated on the medication's label/ medication's box before administer it	0.0	0.0	1.6	30.1	68.3
<b>Right Documentation</b>					
1. Record the medication given on patient's chart and/or medication record right after medication was given.	0.0	0.0	1.6	39.0	59.4
2. Document the medication name, dose, time, route, reason for administration, and effect achieved.	0.0	0.8	4.0	37.4	57.8
3. Document the name/initial name of the nurse who administers medication and sign.	0.0	0.0	4.0	29.3	66.7

\*1 "Never", 2 "Seldom", 3 "Occasionally", 4 "Often", 5 "Always"



However, there were several items that had lower percentage of nurses' adherence. Statement 7 of right drug inferred that nurses did not always administer medications if only prepared by themselves. They might deliver medications that were prepared by other nurses. This situation may be happened due to several factors, such as a "team leader" model which was used in most public hospitals allowing the medication nurse to prepare medication while the other nurses who were team members delivered medications to the patients. In the other words, every nurse in the ward even the nursing student was possible to administer medications as long as they agree to do it. This condition may cause incidence of medication administration errors.

Infusion labeling with estimated time to be finished was also one of the items that was not concerned by participants and they tended to violate this item. Administering medication at the incorrect time may cause altered therapeutic effect of its medication. In one study, incorrect time on delivering medications accounted for 31% of all medication errors<sup>11</sup>. By giving a label on infusion medication, it enables nurses to manage and remember the correct time of medication to be administered which later increases safety practice of medication administration. An initiative has been taken by Australia recently, by releasing national recommendation for labeling lines and injectable medications to prevent medication errors<sup>12</sup>.

Another issue in this study was related to double checking procedure. Although the result showed that most of the nurses often adhere to this procedure, but "often" was not enough. Double checking of medication is a procedure which appears to be a logic strategy to reduce rate of errors. Study reported that people who check the other's work will find about 95% of all mistakes<sup>13</sup>. It means that double checking may help the nurse to prevent errors by eliminating the unintentional mistakes that may occur.

Nurses' adherence on medication administration practice procedure can be influenced by several factors and conditions. Level of education is one of individual characteristics which could improve nurses' knowledge to implement patient safety procedure<sup>14</sup>. Moreover, study revealed that nurses who graduated from bachelor and diploma degree were more compliant to implement patient safety practice than those who graduated from nursing school<sup>10</sup>.

Other reason for the adherence of nurses in this study might be related to work experiences. Demographic data showed that most of the public hospital nurses (60.2%) had work experiences more than six years. Work experience is related to period of a person to work on the specific job. The staffs who work longer are considered to have more experiences than those who work recently<sup>15</sup>. Length of work gives opportunity for staff to improve their knowledge, skills and behaviors that support their work. Nurses who have more experiences have more understanding to the work pattern, aware to their work's environment properly, have sufficient skills and able to identify and analyze the risks and respond quickly in order to prevent errors. Training also has an important role to nursing practice. Study on factors affection to patient safety implementation reported that nurses who have been trained on patient safety were capable to implement proper patient safety 2.6 times more than nurses who have not been trained<sup>16</sup>. Training is a part of education which is used to share a new skills and knowledge or to refresh and maintain the existing knowledge. Qualified training and education will affect to appearance of work directly or work's ability of the staff and increase ability to respond in difficult situation correctly<sup>15</sup>. Although the result of this study showed that there was only 31.7% of participants attending the training program, training is perceived as a variable which can help the nurses to maintain good level of practice to prevent error.

## Conclusion

Medication administration is an activity which is highly related to nurses, and the majority of hospital nurses in Yogyakarta were able to follow medication administration procedures based on six rights principle. However, nurses should perform correctly and follow the procedure of administering medications if only prepared by themselves. Improving nursing practice through quality training and education will be a strategy to improve safe medication practice by nurses. Nurses need to be taught the importance of safety practice during medication administration. Using checklist which consists of six rights medication administration procedure may help nurses to remember and maintain behavior of adherence on safe medication administration practice.



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