

Assessment of Medication Administration Error Reporting Among Hospital Nurses in Indonesia

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ARTICLE INFO	ABSTRACT
<p>Article type: Original article</p> <hr/> <p>Article History: Received: 29-Sep-2019 Accepted: 17-Feb-2020</p> <hr/> <p>Key words: Incident reporting, Medication administration error, Nurse.</p>	<p>Introduction: Nurses play a vital role in the maintenance and promotion of patient safety, as well as medication administration in hospitals. In one small state government-owned hospital in South Jakarta, medication errors were the most reported type of patient safety incidents accounting for 52.5% of incidents which occurred within 2016 to September 2018. Nonetheless, only a small percentage (9.25%) of those reports was presented by nurses. The present study aimed to determine the factors associated with medication administration error (MAE) reporting among nurses.</p> <p>Materials and Methods: A cross-sectional study, followed by qualitative research, was conducted at a state government-owned hospital in Jakarta Indonesia within November 2018-April 2019. Total sampling was used to obtain the 44 clinical nurses included in the quantitative study. The qualitative study used focus group discussion and in-depth interviews of selected informants.</p> <p>Results: Consequences of reporting was found to be correlated with MAE reporting among nurses ($P=0.013$). There was no statistically significant organizational factor or socio-demographic characteristic associated with medication administration error reporting. Through qualitative measures, the factors that most influenced and inhibited error reporting included administrative response and the consequences of reporting. Moreover, managers' support, understanding and self-awareness of the importance of reporting, and a non-blaming culture were recognized as the factors which support error reporting.</p> <p>Conclusion: As evidenced by the obtained results, medication administration error reporting is still low. Reporting incidents can be improved by fostering a non-blaming safety culture. Further studies are recommended to investigate the occurrence of medication errors, as well as reported errors.</p>
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Introduction

Medication errors are a serious health problem which poses daunting challenges to patient safety in hospitals. National Coordinating Council for Medication Error

Reporting and Prevention defined this concept as "any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer". It is reported that

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medication errors are responsible for at least 1 death per day and injure 1.3 million people each year in the United States (1,2).

The Third WHO Global Patient Safety Challenge: Medication without Harm in 2017 aims to reduce medication-related harm by 50% in the next 5 years (2). As a member of the WHO, Indonesia has sought to implement and heightened the quality of patient safety in healthcare centers. The patient safety movement in Indonesia led to the national regulations and the development of National Hospital Accreditation Standards (Standar Nasional Akreditasi Rumah Sakit / SNARS). They indicated that all hospitals must make efforts to prevent and reduce medication errors, and an effective measure which should be implemented in this regard is reporting medication errors (3).

In the attempt to provide Universal Health Coverage through launching the National Healthcare Insurance (Jaminan Kesehatan Nasional / JKN) in January 2014, there has been an accelerated development of new hospitals, particularly in the capital city of Jakarta. A total of 25 small, sub-district based state government-owned hospitals were set up within 2015-2018, including the sub-district general hospital included in the present study.

As one of the first sub-district general hospitals launched in 2015, this hospital has implemented the patient safety reporting system since 2016. Within 2016-September 2018, only 35 patient-safety incidents were reported the majority of which were medication errors (52.55%). Most of the reported medication errors were dispensing errors (57.14%) and prescribing errors (23.8%). Transcribing errors and administration errors were the fewest to be reported, each accounting for approximately 9.53% of total medication errors.

In addition, the least of medication errors were reported by nurses (9.52%), in comparison to pharmacy staff (42.86%), doctors (28.57%), and midwives (14.29%). The small number of medication errors reported by nurses, especially medication administration errors, cast doubt on the existence of such events. According to previous studies, the drug administration is a very vulnerable stage where many errors can be observed (4,5). According to an

unstructured interview with one of the nursing unit coordinators, many medication errors occurred; nonetheless, they remained unreported. Many factors can contribute to low reporting of medication administration errors among nurses. According to Wakefield et al., in order to report errors in drug administration, nurses need to understand the definition of medication errors (6). The contradictory available definitions often lead to a difference of opinion resulting in unreported incidents. Secondly, the fear of being labeled as incompetent by peers and legal actions taken by patients' families may discourage nurses from reporting errors. Thirdly, administrative responses can also cause nurses to become reluctant to report errors since the administration is more likely to blame the individual than the system, apart from the absence of positive response to good work. Finally, the strenuous and time-consuming efforts of reporting tend to hinder reporting among nurses (6).

Other studies suggested other factors related to error reporting, including consequences of reporting, fear, practical barriers, lack of feedback, lack of knowledge, teamwork, open communication, administrative response without punishment, and perception in the importance of reporting (7-13).

Since nurses play a key role in the medication administration process, there is great potential regarding medication error reporting among nurses. Therefore, it is necessary to understand the factors that influence medication administration error (MAE) reporting among nurses in an effort to foster patient safety culture and reduce the risk of patient injury due to medication errors.

Materials and Methods

We conducted a cross-sectional study in a small 38-bed, state government-owned hospital in South Jakarta within November 2018-April 2019. The study population was selected by total sampling. The inclusion criteria entailed clinical nurses working in the inpatient units, high care unit (HCU), emergency department, and operating room, nurses with medication administration duties. On the other hand, the exclusion criteria included clinical nurses working in those units that were on leave.

Since no clinical nurses met the exclusion criteria, the sample reached a total number of 44 nurses that were obtained for the quantitative study. In the present study, the dependent variable was MAE reporting defined as an estimate of the percentage of medication administration errors reported by nurses while working in the hospital where the study was conducted. It could be in the form of near-miss, non-injury events, or adverse events. The independent variables included 11 organizational factors, including knowledge (regarding patient safety and incident classification), hospital policy, reporting process, managers' support, organizational learning, teamwork, open communication, error feedback, administrative responses, the consequence of reporting, and incident characteristics. The respondents' characteristics which were collected included age, gender, education, years of work, employment status, training, and experience with medication errors as factors that might be associated with MAE. The research instrument in the quantitative study included a questionnaire adapted from the Medication Administration Error Reporting Survey developed by Wakefield, a questionnaire by Jember et al., and AHRQ (Agency for Healthcare Research and Quality) Hospital Survey on Patient Safety Culture (6,14,15). The questionnaire consisted of 35 questions divided into 13 variable-based sections: characteristics of respondents, knowledge, hospital regulations, reporting process, manager's support, organizational learning, teamwork, open communication, error feedback, administrative response, consequences of reporting, incident characteristics, and MAE reporting. Each independent variable was represented by 2-4 multiple choice Likert scale questions or yes-no questions.

The dependent variable (MAE reporting) was represented by an open-ended question where the answer was given in a number percentage form. The questionnaire had been validated by 30 study participants in a similar hospital setting. The proportions and mean values of the factors were used to describe the characteristics of the study participants. The median value of MAE was used to determine the cut-off point categories of MAE for poor and good (poor: less than

80% MAE reported and good: 80% or greater MAE reported).

We examined the relationship of MAE reporting with organization factors and respondents' characteristics. The qualitative study was conducted following the data collection of the quantitative study. The methods used in the qualitative study included document review, focus group discussion, and in-depth interview. Document review was carried out for the optionally answered question posed at the end of the questionnaire asking respondents to make comments or recommendations for the improvement of MAE reporting in the hospital. Focus group discussion (FGD) was conducted with nine clinical nurses selected by random sampling to discuss and clarify the results obtained by the questionnaire. At the same time, in-depth interviews were conducted to further clarify and obtain the perspectives of the managerial team by interviewing five informants selected by purposive sampling. They included the head of the inpatient unit, chair of the nursing committee, chair of the quality, and patient safety committee, head of nursing and medical support, and hospital director. Validation of qualitative data was conducted by triangulating sources and methods. Ethical review was carried out at the Faculty of Public Health University of Indonesia, and the research permit was acquired from Jakarta Provincial Government Health Office.

Results

Out of 44 respondents, more than half of cases (59.09%) were male with an average age of 27 years. The majority had a vocational education (83.36%) with a mean work year of 6 years or a median of 5 years. Most of the respondents (61.36%) had patient safety training, and the majority (77.27%) never experienced medication errors. Respondents were mostly from the inpatient units accounting for 40.91% of cases (22.73% pediatric inpatient unit and 18.18% adult inpatient unit), followed by the emergency department: 22.73%, operating room: 15.91%, perinatology unit: 11.36%, and High Care Unit(HCU): 9.09%.

Table 1: Medication administration error Socio-demographic characteristics of subjects

Variable	N (%)	Years
Gender		
Male	26 (59.09%)	
Female	18 (40.91%)	
Age		
Mean		27,84
Median		27
Range		23- 47
Education		
Vocational	38 (86.36%)	
Bachelor	2 (4.54%)	
Nursing profession	4 (9.09%)	
Years of work		
Mean		6.06
Median		5
Range		2-21
Employment Status		
Civil Servant	2 (4.55%)	
Non-Civil Servant	42 (95.45%)	
Work unit		
Adult inpatient ward	8 (18.18%)	
Pediatric inpatient ward	10 (22.73%)	
High care unit	4 (9.09%)	
Perinatology	5 (11.36%)	
Emergency department	10 (22.73%)	
Operating room	7 (15.91%)	
Patient safety training		
Yes	27 (61.36%)	
No	17 (38.64%)	
Experience of medication errors		
Yes	10 (22.73%)	
No	34 (77.27%)	

Table 2 demonstrates that MAE reporting were higher in men (OR 1.70; 95% CI 0.43-6.80), age \geq 27 years (OR 1.43; 95% CI 0.37-5.52), vocational education (OR 0.40; 95% CI 0.03-3.29), work experience \geq 5 years (OR 1.74; 95% CI 0.40-7.71), non-civil servant employee status (OR 1.10; 95% CI 0.01-90.22), no training on patient safety (OR 0.96; 95% CI 0.24-3.81), and with medication error experience (OR 1.5; 95% CI 0.29-8.53). MEA reporting was reported as \geq 80% in HCU (75%), followed by operating room (71.43%), perinatology and emergency department (each 60%), and unit in-house patient unit (33.33%). Nevertheless, no variables were found to be significant ($P < 0.05$) in relation to MAE reporting. The percentage of reported MAE was higher in the group with good knowledge (OR 1.10; 95% CI

0.01-90.22), poor regulation (OR 1.40; 95% CI 0.30-6.83), good reporting process (OR 0.67; 95% CI 0.12-3.44), good organizational learning (OR 1.18; 95% CI 0.31-4.55), good teamwork (OR 1.43; 95% CI 0.37-5.52), good open communication (OR 0.85; 95% CI 0.14-4.71), good error feedback (OR 2.32; 95% CI 0.11-142.71), and good administrative response (OR 1.57; 95% CI 0.23-12.12) (Table 2). The percentage of MAE reporting was also higher in the groups with good managers' support, good consequences of reporting, and good incident characteristics. However, the odds ratio was not able to be calculated due to a limited number of respondents. The consequence of reporting was only statistically significant ($P = 0.013$); nonetheless, the degree of association could not be determined.

Table 2: Medication administration error according to Socio-demographic characteristics of subject

Variable		Medication administration error Reporting < 80%		Medication administration error Reporting ≥ 80%		Medication administration error Odds Ratio	P-value	95% CI (%)
		N	%	N	%			
Gender	Male	11	42.31	15	57.69	1.70	0.387	0.43- 6.80
	Female	10	55.56	8	44.44			
Age	≥ 27 years	10	47.62	13	56.52	1.43	0.555	0.37-5.52
	< 27 years	11	52.38	10	43.48			
Education	Bachelor and Professional	4	19.05	2	8.70	0.40	0.318	0.03-3.29
	Vocational	17	80.95	21	91.30			
Work Experience	≥ 5 years	13	61.90	17	73.91	1.74	0.393	0.40-7.71
	< 5 years	8	38.10	6	26.09			
Employee Status	Non-Civil Servant	20	95.24	22	95.65	1.1	0.947	0.01-90.22
	Civil Servant	1	4.75	1	4.55			
Work Unit	Adult	5	62.50	3	37.50	-	0.428	-
	Pediatric	7	70.00	3	30.00			
	High care unit	1	25.00	3	75.00			
	Perinatology	2	40.00	3	60.00			
	Emergency department	4	40.00	6	60.00			
	Operating Room	2	28.57	5	71.43			
Training	Yes	13	48.15	14	51.85	0.96	0.944	0.24-3.81
	No	8	47.06	9	52.94			
Medication Error Experience	Yes	4	40.00	6	60.00	1.5	0.578	0.29-8.53
	No	17	50.00	17	50.00			

Table 3: Medication administration error according to Organizational Factors

Variable		Medication administration error Reporting < 80%		Medication administration error Reporting ≥ 80%		Medication administration error Odds Ratio	P-value	95% CI (%)
		N	%	N	%			
Knowledge	Poor	1	4.76	1	4.35	1.1	0.947	0.01-90.22
	Good	20	95.24	22	95.65			
Hospital Policy	Poor	16	76.19	16	69.57	1.4	0.622	0.30- 6.83
	Good	5	23.81	7	30.43			
Reporting Process	Poor	4	19.05	6	26.09	0.67	0.578	0.12- 3.44
	Good	17	80.95	17	73.91			
Managers' Support	Poor	0	0	1	4.35	-	0.334	-
	Good	21	100.00	22	95.65			
Organizational Learning	Poor	10	47.62	10	43.48	1.18	0.783	0.31- 4.55
	Good	11	52.38	13	56.52			
Teamwork	Poor	11	52.38	10	43.48	1.43	0.555	0.37-5.52
	Good	10	47.62	13	56.52			
Open Communication	Poor	4	19.05	5	21.74	0.85	0.825	0.14-4.71
	Good	17	80.95	18	78.26			
Error Feedback	Poor	2	9.52	1	4.35	2.32	0.496	0.11-142.71
	Good	19	90.48	22	95.65			
Administrative Response	Poor	4	19.05	3	13.04	1.57	0.587	0.23-12.12
	Good	17	80.85	20	86.96			
Consequences of Reporting	Poor	5	23.81	0	0	-	0.013	-
	Good	16	76.19	23	100.00			
Incident Characteristics	Poor	1	4.76	0	0	-	0.290	-
	Good	20	95.24	23	100.00			

In the qualitative study, the influential variables included administrative response, consequences of reporting, error feedback, and managers' support. Regarding administrative response, nurse practitioners claimed that "there is still blaming culture in the hospital". In this regard, in focus-group discussions, the informants pointed to punitive responses and mentioned the case of a nurse who was relocated to another unit since she had reported the administration of wrong medicines. Nevertheless, through in-depth interviews with managers, the informants rejected the presence of blaming culture. They added that the relocation of

that nurse was not a punitive act, rather they asserted that the nurse was a new employee whose job unit was yet to be determined. The perception of administrative response was linked to the consequences of reporting which was obtained from both open-ended question of the questionnaire and FGD. The informants expressed that they did not report incidents for fear of being blamed, judged poorly, transferred/ relocated to another work unit, considered tattletale by coworkers, and the effect of errors on their work salary. Both administrative responses and consequences of reporting were assessed as inhibiting factors. In FGD, the

informants pointed to “improving the system and not blaming the perpetrators” as one of the factors which promote incident reporting. Regarding managers’ support and error feedback, through in-depth interviews, the informants claimed that they had fully supported the nurses’ efforts to report patient safety incidents, including medication errors.

Moreover, they asserted that they had provided feedback related to these errors, although monitoring had not been carried out properly. In the open-ended question and FGD, practitioner nurse informants also indicated that MAE reporting should be first initiated within the unit, and the root of the problem should be sought within the unit. In addition to these factors, understanding the importance of reporting, rewards, frequent repetitive incidents, or incidents resulting in injuries were also recognized as supporting factors of MAE reporting.

Discussion

According to the National Patient Safety Agency, after fostering a safety culture, leading and supporting staff, and integrating risk management activity, promoting error reporting is the fourth step to patient safety (16).

Reporting patient safety incidents, including medication administration error, is the basis for the prevention of medication errors. If an error occurs and not reported or acted upon, such errors may reoccur and endanger other patients in the future.

Therefore, reporting MAE can improve the quality of service, as well as patient safety, particularly regarding drug services in a hospital. Several factors might make nurses reluctant to report an error.

Based on the results of the present study, the factors that hinder MAE reporting among nurses include fear of consequences and administrative responses. At the same time, the factors that promote MAE reporting among nurses include managers' support, understanding of the importance of reporting errors, and the absence of a 'blaming - culture'. The most influential factors reported in the current study were the consequences of reporting and administrative responses which were found to be consistent in both quantitative and

qualitative studies. Administrative responses are of utmost importance in the development of an incident reporting system. In other studies, administrative responses were found to be a limiting factor in incident reporting. Wakefield et al. found that administrative response to medication errors is the main reason behind nurses’ reluctance to report medication errors (17). In a study conducted by Bayazidi et al., the most important inhibiting factor for reporting medication errors was recognized as blaming individuals rather than the system (18). The consequence of reporting signifies the fear of being considered incompetent or scolded by coworkers. Moreover, the adverse effects of their mistakes on patients can also fuel this fear. In the present study, the consequences of reporting were found to be associated with MAE reporting among nurses. The relationship between the consequences of reporting and MAE reporting was found to be statistically significant only in the bivariate test ($P=0.013$) and not in the multivariate test. Qualitatively, the fear of the consequences of reporting was observed in the open-ended question and FGD. In FGD conducted on practitioner nurses, nurses stated that they are afraid of being relocated to another work unit, being called ‘tattletales’, and salary reduction. These issues were also referred to in the open-ended question in which nurses asserted that they do not report for fear of being blamed or judged as incompetent and negligent. The findings of the present study are in line with research conducted by Maurer on nurse’s perception of medication errors. She found that fear of such consequences as blaming and punishment were inhibiting factors for reporting medication errors (12). In the same vein, Bayazidi found that the most serious obstacles to reporting medication errors included the fear of the consequences and punishment (18). Along the same lines, another study carried out by Engeda also revealed that fear of punishment and loss of prestige were inhibiting factors for reporting incidents to nurses (19). In addition, the fear felt by nurses is also directed at coworkers for fear of being considered ‘tattletales.’ The informants

expressed that as fellow practitioners, nurses feel that everyone is prone to mistakes; therefore, when a nurse reports another coworker's error, it will be considered improper and unfair. In the questionnaire, about 88.64% of respondents stated that they will make their coworkers annoyed if they report their medication errors. Nevertheless, reporting medical errors aims at improving patient safety, rather than individual blaming. In a study performed by Hewitt et al., the fear of being blamed and labeled as 'tattletales' has also been recognized as one of the barriers of reporting safety incidents to nurses and doctors. In the same study, the research subjects considered the reporting system to be a 'tattletale system'; therefore, they decided not to report incidents (20).

The dominance of fear rather than openness demonstrated that there is still a 'blaming culture' in this sub-district general hospital. Even though through in-depth interviews, the management denied that, the 'blaming culture' was felt at the nurse practitioner level. As a result of the management's response to an MAE in 2017 that was deemed punitive by nurse practitioners, nurses assume that there is still a 'blaming culture' which puts the blame on perpetrators, instead of the system.

The blaming attitude of the management system could result from several factors. Among other things, the managerial team at that time had not participated in patient safety, quality improvement, or safety culture training. Therefore, they did not recognize that their actions were considered to be blaming from the standpoint of nurses. The punitive responses of the management system still exert adverse effects despite the remarkable efforts made in this regard. Therefore, training in patient safety and safety culture is of paramount importance. With increased insight into safety culture, it is expected that the top managerial team and the unit manager make wiser decisions and the staff can better understand patient safety. Barriers to reporting could be eliminated or minimized by the presence of a good safety culture. In a culture where members of the organization feel safe to express opinions, they make continuous improvements and establish good

communication. According to research conducted by Neuspial et al., the multidisciplinary team approach with a voluntary and non-punitive reporting system can be effective in increasing incident reporting (21).

A 'non-blaming culture' needs to be applied; nonetheless, a 'just culture' must also be developed wherein individual mistakes are looked upon as human errors or careless behavior and provides justice based on the quality of choices made by the individual (22). In such a culture, a nurse that makes a mistake is not blamed unless the error has occurred repeatedly without any remedial effort indicating negligence and inattention. In a 'just culture', the management system can also evaluate the performance of its staff and impose penalties where deemed appropriate.

However, fostering or changing organizational culture is not an easy task. Despite the relatively young age of this sub-district general hospital, safety culture, especially 'non-blaming culture' and 'just culture' can still be fostered. The second step towards patient safety is leading and supporting staff (16). Managers' support is where the employer provides a work environment that supports patient safety as a top priority. Based on the results of the questionnaire, 97.73% of respondents rated the superiors' support as good. In addition, all informants in the in-depth interview asserted that they encourage their nurse colleagues to report without any fear.

Managers' support plays a key role in encouraging MAE reporting, initiating from the direct supervisor (unit manager, head of the ward), chair of the committee, to the hospital director. If patient safety is not a matter of concern to supervisors, the staff will have no impetus to report since they consider it unimportant. Based on the American Organization of Nurse Executives, the promotion of non-punitive reporting systems is one of the competencies needed by lead nurses to act as agents of change in safety culture(23). Previous studies also suggested the same results. Richter et al. conducted a study on the relationship between patient safety culture and reporting medical errors. They reported the factors with potential relevance to patient safety

culture as error feedback, organizational learning, and management support (10). Maurer found that factors that increase the reporting of medication errors in nurses included positive relationships with clinical supervisors/managers (12).

Managers' support is an issue that needs special consideration, and words do not suffice, rather it must be strengthened by appropriate attitudes, action, and evidence of support. Consequently, subordinates feel supported and would be motivated to report their mistakes. The evidence of support from superiors can be manifested in the form of making policies, conducting field monitoring and evaluation, conducting feedback, and giving rewards.

Managers' support can also be manifested in giving their subordinates the freedom to express their opinions and listen to them. Superiors' support is of utmost importance in the establishment and facilitation of open communication.

In the presence of open communication, nurses may be willing to report their mistakes and the hospital can learn to improve the safety of their patients. This was supported by research performed by Hwang and Ahn who found that communication openness was most related to incident reporting. It is hoped that with the support of good employers, a culture of reporting will be established, thereby increasing MAE reporting (11).

Nurses' awareness about the importance of reporting plays a crucial role in motivating a nurse to report medication errors. A nurse can understand the definitions of patient safety incidents and the flow of incident reporting; nonetheless, if its importance is not highlighted, errors are highly unlikely to be reported. Bayazidi et al. referred to "the perception of benefit in reporting" as one of the factors that support the reporting of medication errors (18).

In line with this finding, Maurer also found that the perception of the benefits of reporting, such as the prevention of errors in the future, increased reporting errors in medication administration (12).

Raising awareness about the importance of medication error reporting is not an easy task either and requires soft-skills. Understanding the concept of 'if that patient is me' and

reporting to prevent future mistakes can be constructed by sharing cases of previous patient safety incidents, experiencing errors, and an organizational culture that supports patient safety.

To understand the importance of reporting, nurses need to understand the concepts of patient safety and incident reporting. They should realize that reporting does not aim to find personal errors, rather it seeks the overall improvement of the hospital system. Therefore, training such as teamwork, effective communication, and safety culture, play a major role in raising awareness about the importance of reporting errors.

Every study has some limitations which should be addressed in the paper. The major limitation of the present study was the small sample size. Although the total sampling method was used in the quantitative study, statistical significance could not be found in the data.

Conclusion

As evidenced by the obtained results, nurses perceived that the percentage of MAE reporting is still low. The most contributing factors to MAE reporting were reported as administrative response and consequence of reporting which can also exert debilitating impacts on reporting.

Moreover, the factors which support MAE reporting included managers' support, understanding the importance of error reporting, and the absence of blaming culture. Reporting incidents can be improved by fostering a non-blaming safety culture.

This is the first study of its kind in the relatively new sub-district general hospital in South Jakarta. Further studies are recommended to investigate the occurrence of medication errors, as well as reported errors.

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