



Barriers to Reporting Medication Administration Errors among Nurses in an Accredited Hospital in Saudi Arabia

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

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ABSTRACT

Aims: The purpose of this study is to identify the main barriers in reporting Medication Administration Errors (MAEs) among multicultural registered nurses in Saudi Arabia and also to explore the relationship between the nurses' demographic variables and their perception of reporting MAEs.

Study Design: This study was based on a questionnaire survey.

Methodology: This is a cross sectional study, whereby responses were collected from 300 nurses of King Fahad Medical City (KFMC) in Riyadh Region, Kingdom of Saudi Arabia. Stratified sampling of nurses was employed for selecting the samples to represent the nine specialized hospitals. The data was collected by meeting the customers face to face. Every question was explained to respondents so that nurses can understand the requirement of each barrier considered. The data collected was analysed using IBM SPSS Statistics 21.

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Results: Administrative response was the main perceived barrier to MAE reporting, followed by fear barriers. The significant administrative barriers include emphasizing the MAE as measure of the quality of nursing care provided, and focusing on the individual rather than looking at the systems as a potential cause of the error. It is observed that nurses with bachelor degree and non-Saudis exhibit higher perception levels of barriers in reporting MAE. However, other demographic factors such as age, gender, experience and attending the training and orientation programs are not significantly related to the overall barriers in reporting MAE.

Keywords: Medication administration errors; barriers; accredited hospital; nurses; multicultural staff; Saudi Arabia.

1. INTRODUCTION

MAEs are considered to be one of the most common types of medical errors. This is because medication prescription, preparation and administration are frequent health care interventions in hospitals. Medication errors are attributed to preventable events that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of healthcare professionals, patients or consumers [1]. Although errors are expected to occur at any stage of the treatment process, the most frequent errors occur during the administration and prescription phase [2]. Specifically, a violation of one of the seven rights of medication use – right patient, right drug, right route, right dose, right time, right reason and right documentation – will lead to the commission of an error [3]. Therefore, all healthcare providers are prone to commit medication errors [4], particularly nurses, given that drug administration is one of their frequent routine tasks [5,6] – they often spend up to 40% of their working time in medication administration [7].

Medication errors are considered to be a highly prevalent cause of injury in hospital settings [8], which extensively drain the financial resources of hospitals around the globe. For example, in the United Kingdom, it was estimated that the incidence of MAEs ranged from 35% to 70% [9], which costs the National Health System (NHS) around £500 million every year [10]. In 2006, the United States Institute of Medicine estimated that preventable drug-related injuries in hospitals will result in extra medical costs of at least \$3.5 billion annually. A study conducted in Germany found that the prevalence of MAE was 36% [11]. The consequences of medication errors range from minor injury to death. Greene [12] claimed that one in two hundred thousand patients will die from medical errors during their hospital stay, as compared to one death in two

million among airline passengers. In addition, it was estimated that two percent of the yearly iatrogenic deaths in the United States are related to MAE [13].

When an MAE occurs, reporting the error to the hospital authorities is the most appropriate step, since hiding errors can lead to severe and preventable adverse consequences. Such a reporting process helps hospitals to identify MAE trends and problem areas, enabling them to prevent future errors and therefore reduce patient harm and injuries as well as saving possible additional costs. Many studies in the literature indicate that only 25% to 63% of MAEs committed by nurses are reported [14,15,16].

There are many reasons indicated in the literature for the underreporting of MAE among nurses, such as fear of disciplinary action against them, including loss of their jobs, and fear of the reactions of colleagues, fear of revenge, and fear of being blamed [17]. In Saudi Arabia, a study found that the majority of nurses (63%) had concerns and/or felt they might face barriers if they reported their MAEs, while the rest of the nurses (37%) had no concerns about reporting their MAEs [18]. More importantly, underreporting medication errors remains a serious problem in many countries due to many individual and contextual factors within their organizations.

Hence, the purpose of this study is twofold: 1) to explore the multicultural registered nurses' perceptions of the barriers to reporting medication errors in Saudi Arabia; 2) to investigate the relationship between the nurses' demographic variables and their perception of reporting of MEs.

2. LITERATURE REVIEW

Because of the large number of medications administered in an acute care hospital that have

the potential for serious error, it is essential for institutions to have an effective MAE reporting system [19]. In most hospitals, this is a non-automated and voluntary process. When a MAE occurs it is essential that it is identified, reported, and then analysed to determine the source and cause of the error from both a risk-management and continuous quality improvement perspective [19]. Previous research has shown that many MAEs are not recognized or reported [20]. Generally, the MAE reporting process involves four basic steps that include: recognition that a MAE has occurred; assessment that there is a need for reporting; preparation of an incident report; and follow-up by the administrative party receiving the report. Though this process appears straightforward, numerous factors may prevent reporting. When MAEs are not reported, the chance to avoid future preventable errors is greatly decreased [19].

An initial study [20] looked at perceived barriers in reporting MAEs. They surveyed 1,384 nurses in 24 acute care hospitals in Iowa. The survey instrument contained 16 statements that reflected reasons why medication errors may not be reported. Participants were asked to indicate their level of agreement using a 6-point Likert-type scale. Individual items with the highest mean value (strongest agreement) included: "No positive feedback for passing medications correctly" (mean = 4.2); "Could be blamed if something happens to the patient" (mean = 4.0); "When medication errors occur the focus is on the individual rather than the system" (mean = 3.9); "Nurses may not think the error is important enough to report" (mean = 3.65); "Nurses believe other nurses will think they are incompetent" (mean = 3.64) and, lastly, "Nurses fear adverse consequences from reporting medications errors" (mean = 3.59).

In another study [19] for confirming the factors that described reasons MAEs may not be reported and to analyse the resulting subscale at the nursing unit level, from a non-random, convenience sample of nurses from 29 of Iowa's acute care hospitals, a total of 1,428 usable surveys were returned. A confirmatory factor analysis supported a four-factor model of reasons why MAEs may not be reported: (a) administrative response; (b) fear; (c) disagreement over an error; and (d) reporting effort. In addition, the mean subscale values were again found in the central range of the scale, indicating neither strong agreement nor

disagreement with a particular set of reasons for why MAEs may not be reported, though overall there was a somewhat higher level of agreement with the fear and administrative response subscales. Supervisors demonstrated a much larger range of subscale values as compared to staff nurses. More importantly, staff and supervisor nurses working on the same unit varied considerably across the four subscales. If there is disagreement between nurses and staff over what constitutes an error, or if supervisor nurses demonstrate a lack of understanding of their staff's perceptions, then interventions to encourage MAE reporting may not work.

In 2001, Wakefield et al. [21] studied medication error reporting in relation to organizational culture and continuous quality improvement (CQI). A major principle of CQI programs is creating an organizational culture that emphasizes employee empowerment, improving work processes and systems, rather than focusing on individual errors. Based on the responses of nurses from the 1994 survey and 1996 follow up, some of the reasons for MAEs not being reported included, fear of blame being placed on individuals, lack of positive response for correct medication administration, and fear of being labelled incompetent. These results suggest potential changes could improve the MAE reporting system by development of an organizational culture opposed to laying blame and education about the importance of analysing patterns of MAE, rather than individual MAEs, to identify system problems.

A 2006 study by Chiang and Pepper [14] sought to identify Taiwanese nurses' perceptions of barriers to reporting medication errors and to examine the relationship between the barriers, cultural factors, and work environment in Taiwan. The researchers collected survey data from a total of 597 nurses. The findings showed that the major perceived barrier to reporting medication errors was fear (e.g. blame, incompetence, reporting consequence) followed by administrative barriers (e.g. no positive feedback, focus on individual). The researchers also found the more power hierarchy and face-saving concern the nurses agreed on (e.g. respect for tradition and authority, group harmony), the more barriers they perceived. The relationship between barriers and work environment (e.g. quality management, peer relations, working conditions) was found to be negative and weak.

In summary, previous research supports that many errors are not reported [21]. Research also supports the idea that there are many different factors as to why this occurs. Two major themes that are found to reoccur in the literature regarding reporting include “fear” and “administrative response”. Other central issues identified include: seriousness of the error, disagreement over whether an error had occurred, and the reporting process itself. It is essential for all types of medication errors to be identified, reported, and analysed so that the source and cause of the error can be determined, in order to prevent future errors keeping our acute care population safe.

2.1 Objectives of the Study

The purpose of this study is to identify the main barriers in reporting MAE among multicultural registered nurses in Saudi Arabia and also to explore the relationship between the nurses' demographic variables and their perception of reporting MAEs.

3. METHODOLOGY

3.1 Study Area/Setting

The setting for this research was King Fahad Medical City, which is a tertiary care, as well as a training medical city. It consists of nine specialized hospitals. These hospitals are: Cardiac hospital, Maternity hospital, Children hospital, Cancer centre, Rehabilitation hospital, Neuroscience hospital, surgical hospital, Ambulatory centre, and the Main hospital. It is considered one of the largest and most advanced medical cities in the Middle East, and employs large numbers of national and international registered nurses.

3.2 Research Instrument

A previously validated questionnaire developed by Weakefield [20] was used to collect data. The permission from author was obtained. Nurses' perception of the barriers to reporting MAE will be measured by the reason why MAE is not reported [19]. The questionnaire requires the nurses to indicate their agreement with the supposed items by using a 6–point Likert-type scale (score from 1= strongly disagree to 6= strongly agree). The questionnaire contains 16 items, with four subscales used for reasons why MAEs are not reported. These subscales are

administrative response, disagreement over definition, reporting effort, and fear. The range of total score is from 16 to 96, with the higher score indicating more barriers to MAE reporting. Two close-ended questions were added to the questionnaire. These questions were about attendance of training program related to medication administration, and orientation program related to the hospital policy regarding the MAE reporting. Other questions were about age, gender, educational level, nationality, experience of making MAE, and reporting the errors.

The items in the original instrument underwent rigorous validation and tested for its psychometric properties through confirmatory factor analysis. On the basis of the construct and criterion-related validity tests and subscale reliability with Cronbach's alpha ranging from 0.69 to 0.76 [15], and was used in various studies [14,17]. The Cronbach's alpha in this study was 0.847.

3.3 Data Collection

A cross-sectional descriptive design was conducted at King Fahad Medical City (KFMC) in Riyadh Region, Kingdom of Saudi Arabia, using self-administered questionnaire (Appendix) to explore registered nurses' perceptions of the barriers to reporting MAEs, and to investigate the relationship between the nurses' demographic variables and their perception of reporting MAEs.

This study targeted all nursing staff working at KFMC across the nine various specialized hospitals, Saudi and non-Saudi registered nurses with both genders male and female, and have a minimal experience of six months at KFMC in Riyadh Region.

After defining the targeted population and establishing the sampling frame; proportionate stratified random sampling of the nine hospitals was done in an attempt to ensure that the sample would be proportionate across the different specialized hospitals. Each one of the nine specialized hospitals namely Cardiac hospital, Maternity hospital, Children hospital, Cancer centre, Rehabilitation hospital, Neuroscience hospital, Surgical hospital, Ambulatory centre, and the Main hospital considered a subgroup or strata, based on the specialty of the area. The process of sampling involved obtaining a sample using simple

random sample from each stratum that is in proportion to the size of the stratum in the total population.

The sample size of this study is determined based on sample size calculation software [22]. The sample size calculation was based on value related to the confidence level, the total of population, and the response distribution. The number of nurses at this hospital is N=2662. Therefore the sample size of this study is 336 participants, at confidence level of 95%, and response rate of 50%.

As shown in Table 1, the total populations in the specialized hospitals or strata were as follow: Cardiac hospital (N=434), Maternity hospital (N=272), Children hospital (N=449), Cancer centre (N=232), Rehabilitation hospital (N=100), Neuroscience hospital (N=268), Surgical hospital (N=190), Ambulatory centre (N=154), and the Main hospital (N=563). The total number of population in all specialized hospitals is (N=2662). The size of the sample from each hospital was calculated based on the proportion to the size of the stratum in the total population as follows: Cardiac hospital 16% (n=55), Maternity hospital 10% (n=34), Children hospital 17% (n=57), Cancer centre 9% (n=29), Rehabilitation hospital 4% (n=13), Neuroscience hospital 10% (n=34), Surgical hospital 7% (n=24), Ambulatory centre 6% (n=19), and the Main hospital 21% (n=71).

A total of 364 self-administered questionnaires were distributed in collaboration with nursing office at KFMC to departments in all targeted specialized hospitals using the internal mailbox,

and 300 completed questionnaires were returned using the designated collection space in each department, with a response rate of 82.4%.

The duration for the data collection was for one month; with weekly follow up visits conducted to all departments to encourage staff participation and improve the response rate. Respondents' Rights and Research Ethics were respected and considered during all study phases.

4. DATA ANALYSIS AND FINDINGS OF THE STUDY

The data collected were analysed using IBM SPSS Statistics 21.

4.1 Respondents' Profile

A total of 300 nurses participated in the study; 6% (n= 18) of them were male and 94% (n=282) were female. The majority 63.7% (n=191) has bachelor degree, and 33.7% (n=101) had diploma. Most of the participants (n= 250) had received orientation program. See Table 3 for more details.

The nurses who had experience of less than one year as registered nurses was 2%, 19.7% had two to five years, 43.7% had six to ten years, 30.3% had eleven to twenty years, and only 4.3% had experience of more than twenty years of experience as registered nurse. The majority 64% (n=192) of participant's age was between 25 – 35 years. The demographic characteristics are summarized in Table 2.

Table 1. Proportionate stratified sampling

The nine specialized hospitals/strata	Population size	Proportionate stratified sample		Distributed questionnaires
		Percentage total in each stratum	Required sample size	
Main	563	21%	71	79
Children	449	17%	57	60
Women	272	10%	34	40
Rehabilitation	100	4%	13	15
Cardiac	434	16%	55	60
Neurology	268	10%	34	35
Cancer	232	9%	29	30
Surgical	190	7%	24	25
Ambulatory center	154	6%	19	20
Total	2662	100%	336	364

Table 2. Demographic characteristics of the sample (n=300)

Variable	Category	Frequency (percentage %)
Gender	Male	18 (6%)
	Female	282 (94%)
Age	Less than 25	4 (1.3%)
	25 – 35	192 (64%)
	36 – 45	81 (27%)
	46 or older	23 (7.7%)
Education	Diploma	101 (33.7%)
	Bachelor	191 (63.7%)
	Master	8 (2.7%)
Years of experience as RN	6 months – 1 year	6 (2%)
	2 – 5 years	59 (19.7%)
	6 – 10 years	131 (43.7%)
	11 – 20 years	91 (30.3%)
	More than 20 years	13 (4.3%)
Year of experience at this hospital	6 months – 1 year	39 (13%)
	2 – 5 years	120 (40%)
	6 – 10 years	123 (41%)
	11 – 20years	18 (6%)

4.2 Significance of Barriers to Report MAEs

The questionnaire consisted of 16 barriers for reporting MAEs. The questionnaire required respondents to indicate their agreement with the items by using a 6-point Likert-type scale (score from 1= strongly disagree, to 6=strongly agree). These barriers were grouped into four factors: Disagreement with definition (4 barriers),

Reporting effort (3 barriers), Fear (5 barriers) and Administrative response (4 barriers). The overall barrier to reporting MAE is arrived at using all the 16 barrier scores. Table 3 displays the 300 respondents' mean and standard deviation against each factor and the overall barrier.

Based on the mean, it can be observed that administrative response was the top perceived barrier to MAE reporting followed by fear barriers. These administrative barriers include emphasizing the MAE as measure of the quality of nursing care provided, and focusing on the individual rather than looking at the systems as a potential cause of the error.

Table 4 shows the results of the one-sample “t-test” applied on MAE scores. It can be observed that the overall barrier and the perception levels for the factors of fear, reporting effort and disagreement with definition were observed to be significantly lower than the neutral perception level of 3.5 (on a six point scale), at 5% level of significance. This reflects the fact that the participants do not have significant difficulties in reporting medication errors.

Further one-sample “t-tests” were applied to all the 16 barriers for reporting MAEs. Table 5 shows the test results of those barriers which present significant difficulty in reporting MAEs. It can be observed that the main barriers to report MAE are the blame of nurses if something happens to the patient as result of the MAE, too much emphasis being placed on MAE, nursing administration focusing on the individual rather than looking at the systems as a potential cause of the MAE and the chances of suing the nurse if MAE is reported.

Table 3. Factor means and standard deviations

Factor/barrier	Mean	Standard deviation
1. Disagreement over definition		
Nurses do not agree with hospital's definition of a medication error.	2.0433	1.09908
Nurses do not recognize an error occurred.		
Medication error is not clearly defined.		
Nurses may not think the error is important enough to be reported.		
2. Reporting effort		
Filling out an incident report for a medication error takes too much time.	2.9244	1.22960
Contacting the physician about a medication error takes too much time.		
The expectation that medications be given exactly as ordered is		

Factor/barrier	Mean	Standard deviation
unrealistic.		
3. Fear		
Nurses believe that other nurses will think they are incompetent if they make medication errors.		
The patient or family might develop a negative attitude toward the nurse, or may sue the nurse if a medication error is reported.		
Nurses are afraid the physician will reprimand them for the medication error.	3.3280	1.23609
Nurses fear adverse consequences from reporting medication errors.		
Nurses could be blamed if something happens to the patient as a result of the medication error.		
4. Administrative response		
The response by nursing administration does not match the severity of the error.		
No positive feedback is given for passing medications test correctly.		
Too much emphasis is placed on med errors as a measure of the quality of nursing care provided.	3.4867	1.07836
When med errors occur, nursing administration focuses on the individual rather than looking at the systems as a potential cause of the error.		
5. Overall barrier to reporting MAE	2.9708	0.89066

Table 4. One-sample t-test results

	t	df	Sig. (2-tailed)	Test value = 3.5		
				Mean difference	95% confidence interval of the difference	
					Lower	Upper
Overall barrier to reporting MAE	-10.291	299	.000	-.52917	-.6304	-.4280
Administrative response	-.214	299	.831	-.01333	-.1359	.1092
Fear	-2.410	299	.017	-.17200	-.3124	-.0316
Reporting effort	-8.107	299	.000	-.57556	-.7153	-.4358
Disagree with definition	-22.956	299	.000	-1.45667	-1.5815	-1.3318

Table 5. Barriers which present significant difficulty in reporting MAEs

Barriers to report MAE	Mean	Standard deviation	t	Sig. (2-tailed)
1. The patient or family might develop a negative attitude toward the nurse, or may sue the nurse if a medication error is reported.	3.76	1.725	2.643	0.009
2. Nurses could be blamed if something happens to the patient as a result of the medication error.	4.47	1.716	9.756	0.000
3. Too much emphasis is placed on med errors as a measure of the quality of nursing care provided.	3.99	1.515	5.641	0.000
4. When med errors occur, nursing administration focuses on the individual rather than looking at the systems as a potential cause of the error.	3.92	1.663	4.340	0.000

4.3 Influence of Demographic Factors on Barriers to Report MAE

Chi-Square tests were conducted to find whether the demographic factors have any influence on barriers to report MAE. Table 6 provides the Chi-Square values and its two-tailed levels of significance for significant barriers.

Table 6. Results of chi-square tests for significant variables

Variable	Pearson Chi-square	Significance (two-tailed)
Education level	16.918	0.002
Ethnic group	44.759	0.000

It is observed that nurses with bachelor degree and non-Saudis exhibit higher perception levels of barriers in reporting MAE. However, other demographic factors such as age, gender, experience and attending the training and orientation programs are not significantly related to the overall barriers in reporting MAE.

5. SUMMARY AND CONCLUSIONS

This paper presents an original survey conducted with a particular view of the specific perceptions of the nurses at KFMC, which is a tertiary care, as well as a training medical city, in order to identify the main barriers in reporting MAE among multicultural registered nurses in Saudi Arabia and also to explore the relationship between the nurses' demographic variables and their perception of reporting MAEs.

Administrative response was the top perceived barrier to MAE reporting followed by fear barriers. These administrative barriers include emphasizing the MAE as measure of the quality of nursing care provided, and focusing on the individual rather than looking at the systems as a potential cause of the error. The results of the study corroborate the findings of other earlier studies [23,24] which reported that the perceived barriers to MAE reporting include fear of manager and peer reactions, fear of being blamed and lawsuits, and fear of reprisal. Similar findings were supported in a Taiwanese study which used the same instrument [14]. In a study conducted in the United States, fear and administrative responses were reported as the main reasons for not reporting the MAE [20]. A

Jordanian study found that fear of disciplinary action and the reaction of nurse managers were the most frequent reasons related to nurses' failure to report MAE [25]. These results are similar to our findings in the current study which were negative administrative response and fear. This similarity in all previous literature means that the nurses' perceptions of MAE reporting barriers are similar in different locations and cultures.

Nurses' demographic characteristics, except education background and ethnic groups, were not associated with the perceived barriers. However, an earlier study [24] reported that nursing experience contributed to reporting MAE.

In order to encourage nurses to report MAEs, non-punitive and supportive working cultures are needed to motivate nurses to report MAE. Some approaches should be considered at the organizational level, such as periodical assessment of dealing with medication administration and periodical review of nursing competency. Making the incidence report of MAE anonymous might improve reporting of MAE. These measures will encourage more reporting because it reduces the potentiality of disciplinary actions and individual blame. Further the issue could be explored from the physicians' and pharmacists' view point. Educating nurses about the medication process and their role in this process could bring down MAEs.

ETHICAL CONSIDERATION

Participation on the study was voluntary and based on informed consent. The study was reviewed and approved by the Institutional Review Board (IRB) at King Fahad Medical City. Ethical integrity was monitored by nurse managers reporting directly to the IRB. A reports was submitted to the IRB on the process of data collection, consenting of participants, and for protection of their rights.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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APPENDIX

Barriers to Reporting Medication Administration Error Survey

The purpose of this survey is to seek input, based on your clinical experience as a staff nurse on the barriers of reporting medication administration errors.

This survey will take approximately 10 to 15 minutes to complete. All responses will be kept strictly confidential. Thank you for your time and cooperation.

For the purposes of this survey, Medication Administration Errors (MAEs) are defined as errors related to the actual ingestion, injection or application of individual medication doses (e.g., wrong method of administration, wrong patient, wrong additive).

Kindly circle the number that best reflects the extent to which you agree that the following reasons contribute to why errors are not reported on your unit

	Strongly disagree	Mod. disagree	Slightly disagree	Slightly agree	Mod. agree	Strongly agree
1. Nurses do not agree with hospital's definition of a medication error.	1	2	3	4	5	6
2. Nurses do not recognize an error occurred.	1	2	3	4	5	6
3. Filling out an incident report for a medication error takes too much time.	1	2	3	4	5	6
4. Contacting the physician about a medication error takes too much time.	1	2	3	4	5	6
5. Medication error is not clearly defined.	1	2	3	4	5	6
6. Nurses may not think the error is important enough to be reported.	1	2	3	4	5	6
7. Nurses believe that other nurses will think they are incompetent if they make medication errors.	1	2	3	4	5	6
8. The patient or family might develop a negative attitude toward the nurse, or may sue the nurse if a medication error is reported.	1	2	3	4	5	6
9. The expectation that medications be given exactly as ordered is unrealistic.	1	2	3	4	5	6
10. Nurses are afraid the physician will reprimand them for the medication error.	1	2	3	4	5	6
11. Nurses fear adverse consequences from reporting medication errors.	1	2	3	4	5	6

	Strongly disagree	Mod. disagree	Slightly disagree	Slightly agree	Mod. agree	Strongly agree
12. The response by nursing administration does not match the severity of the error.	1	2	3	4	5	6
13. Nurses could be blamed if something happens to the patient as a result of the medication error.	1	2	3	4	5	6
14. No positive feedback is given for passing medications test correctly.	1	2	3	4	5	6
15. Too much emphasis is placed on med errors as a measure of the quality of nursing care provided.	1	2	3	4	5	6
16. When med errors occur, nursing administration focuses on the individual rather than looking at the systems as a potential cause of the error.	1	2	3	4	5	6

To assist in data analysis and interpretation of the survey results, we would appreciate if you would provide us with the following information--Please complete the following questions by filling in the circles and/ or space that best represents you and your unit

17. Age: ☐ Less than 25 ☐ 25 – 35 ☐ 36 – 45 ☐ 46 or older

18. Gender: ☐ Male ☐ Female

19. What is your educational Level?

- ☐ Post graduate Diploma Degree
- ☐ Post graduate Bachelor Degree
- ☐ Masters Degree

20. Country of Origin: _____

21. How long have you been working as a RN?

- ☐ 6 months – 1 year ☐ 2 – 5 years ☐ 6 – 10 years ☐ 11 – 20 years
- ☐ More than 20 years

22. How long have you been working as a RN at this hospital?

- ☐ 6 months – 1 year ☐ 2 – 5 years ☐ 6 – 10 years ☐ 11 – 20 years
- ☐ More than 20 years

23. Have you attended any training program related to medication administration error in this hospital?

- ☐ Yes ☐ NO

24. Have you received any orientation program related to hospital policy regarding the MAE reporting in this hospital?

☐ Yes ☐ NO

25. Have you ever made a medication administration error in this hospital?

☐ Yes ☐ NO

26. Have you ever fail to report medication administration error that you made in this hospital?

☐ Yes ☐ No ☐ Not applicable, no experience of medication errors

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