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NURSES' WILLINGNESS TO REPORT MEDICATION ADMINISTRATION ERRORS IN SAUDI ARABIA

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ABSRTACT

Reporting of medication administration errors (MAEs) is one means by which health care facilities monitor their practice in an attempt to maintain the safest patient environment. This study examined the likelihood of Registered Nurses (RNs) reporting MAEs when working in Saudi Arabia. It also attempted to identify potential barriers in the reporting of MAE. This study found 63% of RNs raised concerns about reporting of MAEs in Saudi Arabia - nursing administration was the largest impediment affecting nurses' willingness to report MAEs. Changing attitude to a non-blame system and implementation of anonymous reporting systems may encourage a greater reporting of MAEs.

Key words: *medication errors, nursing, safety, reporting, report incident, barrier.*

Medication administration errors (MAEs) frequently result in adverse patient outcomes. They impact heavily upon patient morbidity and mortality and have thus created a global push toward the safe administration of medications.^{1,2} In Australia, the second highest number of reported incidents after falls is medication errors; these account for an estimated 20% of total reported incidents.¹ In developing countries such as Saudi Arabia, there is no accurate data about safety problems such as MAEs, but it is estimated that 10% of people are potentially affected.³ In the United States, MAEs are one of the most common adverse drug events affecting about 1.5 million people annually.⁴

When Registered Nurses (RNs) report a MAE promptly, it allows immediate and appropriate medical action. Thus, MAE incident reports are one of the most preventable causes of patient harm.⁵ However, the number of MAEs, which are reported, are less than the actual number of existing errors in the clinical setting.⁶ This underreporting may originate from RNs' perceptions about MAE reporting, perceived barriers to reporting, attitudes toward error reporting^{6,7}, and ability to identify the error.⁶ Some MAEs are recognised only by the nurse who committed the error. Although there are many approaches that identify the occurrence of MAEs, they are mainly identified via passive and voluntary reporting systems. Voluntary MAE reporting systems depend on the ability and willingness of RNs to detect and report their own errors as part of routine practice.⁸

RNs however are not always willing to report their errors. In a survey of RNs in 14 hospitals in Taiwan, 87.7% of the RNs had a willingness to report the MAEs if there were no negative consequences of reporting whereas 11.3% were not willing to report MAEs.⁸ It is important that RN's report all MAEs if optimal patient care and outcomes are to be attained. Reporting of MAE is essential to collect information on such incidents, as it will help health care givers to improve the medication administration process, and to learn from their errors. It will also improve the quality of nursing care and provide a safe environment.⁸

Factors that minimize the possibility for reporting MAEs are include both management practices and a professional culture that results in an adverse outcome for the individual who has been involved in the MAE. The unwillingness of RNs to report MAEs is primarily due to their apprehensions regarding the practice settings, such as negative reactions from colleagues and administrators, losing their patients' trust and punitive actions after reporting.^{8,11}

Many studies have addressed the causes of medication errors. However, limited research has been conducted to assess RNs' willingness to report their MAEs. Issues that are related to patient safety require special attention, particularly in developing countries.³ This is because the health care systems in these countries are not well developed or organized and this may result in inaccurate information being reported about patient safety problems, such as MAEs.³ Therefore, the accurate understanding of patient safety in relation to MAEs in developing countries may be influenced by the underreporting of incidents. Although there is no accurate existing data about the size of any patient safety problem in Saudi Arabia (such as MAEs) it is estimated that up to 10% of patients are potentially affected.³ Recently, a study conducted to assess the prevalence of MAEs in the Eastern region of Saudi Arabia reported that the prevalence of MAEs is 1.58 for every 1000 patients.¹² Considering the results of this study, the rate of MAEs in Saudi Arabia appears lower than figures which other countries report. However, it is possible this outcome may be primarily due to the underreporting of MAEs in Saudi Arabia.¹² The relevant literature about MAE and its reporting in Saudi Arabia is scant at best. Given this, there appears a clear need to investigate the possibility of underreporting MAEs in Saudi and the RNs' willingness to report these errors.

The primary aim of this study was to determine how frequently RNs report MAEs when practicing in Saudi Arabia. A secondary aim was to identify potential factors that may contribute to the nonreporting of MAE.

METHODS

This study used a structured questionnaire to survey a convenience sample of RNs who were working in a tertiary referral hospital in Saudi Arabia. This research was approved by the Human Research Ethics Committee at the Queensland University of Technology in Australia and the Ministry of Higher Education in Saudi Arabia. Voluntary participation involved the completion of an anonymous survey. The study survey was administered during June and July 2011.

Setting

The setting for this research was the King Abdulaziz University Hospital, which is a tertiary referral centre as well as a training hospital. It is the largest teaching hospital in the western region of Saudi Arabia and employs large numbers of domestic and international RNs.

Research instrument

The questionnaire was developed after analyzing several studies that examined the RNs' willingness to report MAEs using the Medication Administration Errors Reporting Scales.^{8,13,14} With regard to these tools' content validity, they contained the factors related to RNs' perception of MAEs and the potential barriers to reporting MAEs that were used in this Study's questionnaire. However, none of these tools included holistic elements that would facilitate achieving the objectives of this study. Therefore, the questionnaire developed for use in the this study combined and modified components of the 3 tools.^{8,13,14} Given past use of these tools (and in some cases repeated use)^{8,13,14}, content validity was deemed acceptable by this research team.

Our study instrument measured (1) nurse demographic data (9 items); (2) Nurse's perception to report MAE (6 items); (3) potential barriers to reporting MAEs that would be

classified as (a) personal fear factor (6 items), (b) administration factors (4 items); and (c) reporting processes factor (3 items).

Data management and statistical analysis

Statistical analysis was performed using the Statistical Package for the Social Sciences Software the IBM SPSS Statistics for Windows Version 18 software (IBM, Armonk, New York). Nonparametric statistics, including descriptive analysis, χ^2 test of independence were decided as appropriate statistical methods to analyze the data due to the categorical nature of this study data. However, participant numbers for this study were fewer than expected and thus when performed the χ^2 test yielded no significant results owing to the small sample. The χ^2 test of independence failed to generate any results even approaching statistical significance. Subsequent to this a χ^2 test of Goodness of Fit was utilized. It helps to evaluate if there were significant differences in the responses for each of the choices. Specifically, the χ^2 test of Goodness of Fit assumes that there are an equal number of responses across all choices and then compares the actual values to the expected values (the equal number of responses across all choices). A χ^2 Goodness of Fit was used to examine if there were significant differences in the actual versus the expected number of RNs who reported MAEs. It was also used to examine the significant differences of reporting of various fears and concerns related to MAE reporting. Finally, the linear relationships between the demographic variables and MAE self-reporting were examined using a Pearson product-moment correlation analysis.

RESULTS

Sixty-two RNs participated in this study. RNs indicating they had no concerns about reporting their personal MAEs in Saudi Arabia numbered 23 (37%). The study questionnaire has an exit point for those RNs who do not feel MAE reporting is an issue. Thirty-nine (63%) RNs surveyed had concerns and/or felt they might face barriers, such as personal and/or administrative barriers, if they reported their MAEs.

Table 1 outlines the demographics of all 62 participants who completed the questionnaire, the 23 participants who had no concerns with the reporting of MAEs (and exited the questionnaire following section I) and the 39 participants who did have concerns about reporting MAE (and completed the full questionnaire). Results for analysis in this study are based on the 39 participants who had concerns about reporting MAE and completed the full questionnaire.

TAKE IN TABLE 1 HERE.

When all participants were asked whether they have ever made an MAE, 56.4% of the participants indicated that they have not made any MAEs during their career whereas 43.6% of the participants are aware of making an MAE. There were no statistical differences in the actual number of RNs indicating they had not made an error (17) and those indicating they had made an error (22) (expected value 19.5, $P=0.423$). All RNs were asked whether they reported the MAEs that they committed. The possible answers were *never*, *sometimes*, and *always*. The results indicated that there was no significant difference between the actual

number of RNs responding *never* (11), *sometimes* (14), and *always* (14) compared to the expected number for each response (13), $P = 0.794$.

Awareness of the importance of reporting MAEs

Results indicate that nearly all RNs (85%) believed that reporting MAEs was a worthy use of their time ($p < 0.01$). Sixty seven percent of RNs indicated that they would report their MAEs even if they did not harm the patient ($p = 0.037$) or improve the patients' health ($p = 0.037$). All 39 respondents believed that MAEs should be reported when they occur (Table 2).

TAKE IN TABLE 2 HERE.

Potential barriers to report MAEs

Three possible factors that may influence nurses' voluntary decision to report MAEs were examined (Table 3).

Two personal factors were significantly associated with an unwillingness to report MAEs: concerns about facing repercussions ($p = 0.037$); and a lawsuit or legal action ($p < 0.01$). In addition, all 4 concerns related to the nursing administration were significantly associated with unwillingness to report MAEs in Saudi Arabia. Eighty seven percent of RNs did not agree with the statement that they would not know how to report a MAE if it occurred ($p < 0.01$) indicating a knowledge deficit about reporting processes did not significantly affect RNs' willingness to report MAEs.

TAKE IN TABLE 3 HERE.

To evaluate the linear relationship between nurses' demographic variables and whether they reported an MAE that they made, a Pearson product-moment correlation analysis was conducted. Results of the correlation analysis indicated that there was a moderate negative correlation between education level and whether a RN ever made a medication administration reporting error ($r = -0.460$; $n = 39$; $P < 0.01$) where higher levels of education were associated with a fewer number of MAEs. There was a moderate positive correlation between education level and the reporting of self-made MAEs ($r = 0.344$; $n = 39$; $p = 0.032$). Here, increases in education level were associated with a greater frequency of self-reporting of MAEs. There was also a moderate negative correlation between whether RNs ever made a MAE and the frequency of their self-reported MAEs ($r = -0.369$; $n = 39$; $p = 0.021$). As expected, those who said they made a MAE were associated with more frequent self-reporting of MAEs (Table 4).

TAKE IN TABLE 4 HERE.

DISCUSSION

This study indicated there is a possibility that MAEs be underreported in Saudi Arabia. Sixty three percent of participants had concerns and believed that they would face barriers if they reported their MAEs. Suggesting MAEs are not reported accurately in Saudi Arabia as only one-third of participants (36%) indicated that they “always” reported their MAEs. The findings of this study align with some Western studies which found less than half of all MAEs were reported.^{6,15} One study suggests that only 45.3% of Taiwanese RNs report

MAEs.⁷ Although these studies are by no means exhaustive, one wonders if there is a prevalence of underreporting MAEs in the nursing field regardless of culture.

This study found all respondents to agree that MAEs should be reported when they occur. It was also noted that a significant number of RNs believed that reporting MAEs was a worthy use of their time ($p < 0.01$). Consequently, although it may be assumed that the RNs working in Saudi Arabia are aware about the importance of reporting MAEs, only 37% had no concerns about reporting MAEs. This finding is in contrast with that of previous studies.^{9,16} These differences may be related to the implementation of the anonymous incident reporting systems in King Abdulaziz University Hospital since 2007. However, although the findings of the this study are in no way indicative of Saudi Arabian practice, it seems this strategy, which was implemented to encourage reporting of MAEs, may positively affect RNs' willingness in King Abdulaziz University Hospital to report an MAE. However, the actual reasons for this result could not be identified and further research to confirm this assumption is required in different hospitals in Saudi Arabia.

Supporting the outcomes of previous studies^{6,17}, in this study, there was a greater number of RNs who believed that they would report MAEs even if they did not harm the patient ($p = 0.037$), or improve the patient's health ($p = 0.037$). This indicated that RNs in Saudi Arabia have a positive attitude about MAEs reporting, but this attitude may be influenced by some individual and organizational factors.

Potential barriers of reporting MAEs

The 3 potential factors that may affect RNs' willingness to report MAEs were examined. In this study, the factors related to nursing administration were found to be most significant in affecting RNs' willingness to report their MAEs in Saudi Arabia.

An interesting finding of this study is that personal fear associated with unwillingness to report MAEs was limited to 2 personal factors: concerns about facing repercussions and a lawsuit or legal action. Although these results are supported by other studies^{10,18}, this study also showed that other personal fear factors were not significantly associated with RNs' willingness to report MAEs in Saudi Arabia. This finding differs with other studies that indicate RNs' fear being viewed as incompetent-a significant barrier in reporting MAEs.^{6,8} It is possible that this may be because most RNs in the study sample were working under contracts and they may have been primarily concerned about any factors that could affect their contract renewal such as facing repercussions or a lawsuit or legal action.

Although, there is no existing data about the attitude of nursing administrations about reporting of MAEs in Saudi Arabia, World Health Organization emphasized the importance of changing attitudes about MAEs in developing countries, including Saudi Arabia.³ This supports the present study results, as it indicated that there might be significant issues related to nursing administration attitudes toward MAEs in Saudi Arabia. Similarly, previous studies reported that the majority of RNs have reported that the fear of being punished by their manager constrained them in reporting errors.^{6,16}

A review of the literature of barriers to report MAEs shows that there is an association between some RNs' demographic characteristics and their willingness to report errors.¹⁵ In this study, frequency of self-reporting of MAEs was significantly associated with RNs' education level ($p = 0.032$); frequency of reporting was higher among the RNs who had higher levels of education. This study also found a significant correlation between experience of MAEs and frequency of self-reporting of MAEs ($p = 0.021$). This study is not alone in noting RNs who had experience of MAEs were less likely to report their MAEs.⁷ However, our study is inconsistent with other studies which reported that there was no significant association between RNs' characteristics such as experience of error and their decision to

report their MAEs.^{8,18} This difference in the results may be related to the severity of medication errors. Minor errors were less likely to affect RNs' willingness to report their errors in the future. In this study and also in previous studies, it was difficult to determine the effect of the severity of MAEs that had been experienced.

Study limitations

The study instrument used a self-report survey. It might be assumed the questionnaire did not fully investigate the variables associated with willingness of reporting in depth as all survey questions were closed. In addition, the small sample size limited the data analysis processes. It was proposed to manage the data using a χ^2 test of independence, but this test failed to generate results approaching any significance owing to the small sample. Given these limitations the study data should be viewed with discretion and considered of benefit in informing future research.

CONCLUSION

MAEs among RNs will always exist. More emphasis should be placed on error reporting and their potential benefits, which help in providing critical information that is necessary in designing effective systems. The key factors that influenced RNs' willingness to report their MAEs in this study were associated with nursing administration. Therefore, efforts should concentrate on building effective systems that are realistic and manageable. This study emphasized the benefit of implementation anonymous reporting systems. The study also emphasized a need for change in dealing with reporting MAE's to a non-blame system should be considered to encourage reporting of errors.

The findings of this study may be of benefit to nursing educators and managers. They will be able to understand the potential factors that might hinder RNs from reporting the MAEs

and then act on this to enhance patient safety and prevent future errors. The outcomes also have implications for future research. A larger and longitudinal study would be required to produce findings that are more generalizable to the health care system.

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- 2) Table 2. Nurses perceptions related to MAE reporting.
- 3) Table3. Possible factors associated with reporting MAEs.
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Table 1.
DEMOGRAPHIC FREQUENCY DISTRIBUTIONS (N = 62)^a

	Total	No Concerns Related to Reporting MAEs	Concerns Related to Reporting MAEs
Gender			
Female	51(82.3%)	21 (41%)	30 (59%)
Male	11 (17.7%)	2 (18%)	9 (82%)
Age, y			
< 25	7 (11.3%)	3 (43%)	4 (57%)
25-40	41 (66.1%)	18 (44%)	23 (56%)
> 40	14 (22.6%)	2 (14%)	12 (86%)
Years of postgraduate nursing experience, y			
< 1 years	3 (4.8%)	2 (67%)	1 (33%)
1-5 years	12 (19.4%)	5 (42%)	7 (58%)
5.1-10 years	23 (37.1%)	9 (39%)	14 (61%)
> 10 years	24 (38.7%)	7 (29%)	17 (71%)
Education level			
Diploma-Associated Diploma	32 (51.6%)	15 (47%)	17 (53%)
Bachelor degree	30 (48.4%)	8 (27%)	22 (73%)
Postgraduate	0 (0.0%)	0 (0.0%)	0 (0.0%)

Ethnicity

Arabian	9 (14.5%)	3 (33%)	6 (67%)
Asian	52 (83.9%)	20 (38%)	32 (62%)
European	0 (0.0%)	0 (0.0%)	0 (0.0%)
Other	1 (1.6%)	0 (0.0%)	1 (100%)

Areas predominantly worked as a nurse

Medical wards	14 (22.6%)	2 (14%)	12 (86%)
Surgical wards	15 (24.2%)	6 (40%)	9 (60%)
Pediatric wards including: surgical, medical wards.	14 (22.6%)	8 (57%)	6 (43%)
Intensive care unit	13 (21.0%)	5 (38%)	8 (62%)
Specialties e.g. emergency room, operation rooms, day care unit and dialysis unit	12 (19.4%)	6 (50%)	6 (50%)
Other	5 (8.1%)	0 (0.0%)	5 (100%)

^a Values are expressed as n (%).

Abbreviations: MAEs, medication administration errors.

Table 2.

CHI-SQUARE GOODNESS OF FIT: NURSES PERCEPTIONS RELATED TO MAE REPORTING

	No	Yes	<i>p</i>
When a MAE occurs, I think it should be reported to the department?	0	39	-
I believe that reporting MAEs is a worthy use of my time	6 (15%)	33 (85%)	0.000
I will report an MAE even if it does not harm the patient.	13 (33%)	26 (67%)	0.037
I will report an MAE even if it is not possible to improve the patient's health status subsequent to the MAE	13 (33%)	26 (67%)	0.037
I am willing to report an MAE only when similar errors have occurred previously in the department.	22 (56%)	17 (44%)	0.423
I would report an MAE even if I was not involved	17 (44%)	22 (56%)	0.423

in it.

Expected value = 19.5.

Abbreviations: MAEs, medication administration errors.

Table3

CHI-SQUARE GOODNESS OF FIT: POSSIBLE FACTORS ASSOCIATED WITH REPORTING MAEs

	No	Yes	<i>p</i>
A. Personal fear associated with reporting MAEs			
I would be hesitant to report an MAE as I believe that in Saudi Arabia:			
I would be viewed as incompetent by colleagues.	18 (46%)	21 (54%)	0.631
I would be discriminated against by coworkers.	22 (56%)	17 (44%)	0.423
Other employees in the hospital would become aware of my MAE.	22 (56%)	17 (44%)	0.423
It is likely I would face repercussions.	13 (33%)	26 (67%)	0.037
It is possible I may face lawsuit or legal action.	9 (23%)	30 (77%)	0.001
B. Nursing administration concerns			
I believe that in Saudi Arabia:			
I would receive negative feedback from nursing administration if I were to report a MAE	7 (18%)	32 (82%)	0.000
Nursing administration believe that on MAE are a measure of the quality of nursing care provided.	5 (13%) 9(23%)	34 (87%) 30 (77%)	0.000 0.001
The response toward staff by nursing administration would not match the severity of the MAE.			
Nursing administration would focus on the individual nurse as the primary cause of the medication error	10 (26%)	29 (74%)	0.002
C. Reporting process			
I believe that in Saudi Arabia:			
Incident report forms are too complicated.	22 (56%)	17 (44%)	0.423
Incident reporting wastes too much time.	17 (44%)	22 (56%)	0.423
I would not know how to report a MAEs if it occurred.	34 (87%)	5 (13%)	0.000

Expected value = 19.5.

Table 4**CORRELATION ANALYSIS: RELATIONSHIP BETWEEN DEMOGRAPHICS AND ERROR REPORTING**

	1	2	3	4	5
1. Gender	-				
2. Age	-0.079	-			
3. Year of postgraduate nursing experience	-0.230	0.614	-		
4. Education level	-0.319	0.218	0.200	-	
5. Have you ever made a medication reporting error?	0.066	-0.115	0.074	-0.460	-
6. If you made an MAE in Saudi Arabia hospitals, did you report the MAE that you made?	-0.110	0.183	0.220	0.344	-0.369