Original Article

Perceived Barriers Toward Medication Error Reporting Among Nurses in Governmental Hospitals in Jeddah, Saudi Arabia

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Abstract

Background: Medication errors (MEs) are a significant concern in healthcare, being one of the most prevalent types of medical errors. However, these errors are often underreported, which complicates efforts to improve patient safety and care quality.
Objective(s): This study investigates the barriers to reporting MEs from the perspective of nurses in four governmental hospitals in Jeddah, Saudi Arabia.
Methods: A cross-sectional study was conducted among 417 nurses in four governmental hospitals in Jeddah, Saudi Arabia. Nurses (who were registered with the Saudi Commission for Heath Specialties and had at least one year of work experience) were selected using a proportional random sampling. An online questionnaire on socio-demographic characteristics and barriers to reporting MRs was used to collect the data. Data were analysed using SPSS version 26.
Results: Medication errors were reported by 41.2% of nurses. Lack of knowledge about the process of reporting MEs was the main perceived barrier, followed by not wanting to punish a colleague or friend. Non-Saudi and nurses with 5-10 years of experience were found to have higher perceptions of reporting MEs.
Conclusion: The high frequency of non-reporting of MEs among nurses in Jeddah, Saudi Arabia, is of great concern. Effective programs to improve the ME reporting system need to be developed to mitigate this problem.

Keywords: Medication errors, barriers, nurses, patient safety, Saudi Arabia

INTRODUCTION

Medication error (ME) is an avoidable event that can lead to unsuitable use of medication and may cause an adverse effect on patients, whether the ME is committed by a health care professional, including physicians, pharmacists and nurses, or by the patients themselves. Healthcare products, procedures, and systems may be involved in these events, including prescriptions, ordering communications, product labelling, packaging, nomenclature, formulation, dispensing, allocation, administration, teaching, monitoring, and use. [1,2]

Medication administration is defined as the procedures performed by a nurse in preparing and dispensing medication to a patient and is distinct from the prescribing and dispensing of medication by physicians and pharmacists. As a result, nurses can make medication administration errors when administering medicines. The MEs may occur at any stage of the medication administration process. [3,4]

The consequences of MEs include a wide range of effects, including death. MEs sometimes cause new, temporary or permanent conditions such as rashes, itching or skin blemishes. [5] The Institute of Medicine (IOM) has reported that MEs have affected at least 1.5 million people and that the medical costs of handling MEs in hospitals are approximately 3.5 billion dollars per year. [6]

According to Elliott et al. [7], nurses being one of the most important health care professionals, are usually the first to deal with medical procedures and are able to avoid many errors. Compared to other professionals in the field, nurses spend significantly more time with patients and care for them continuously. [8,9] Therefore, nurses are generally more at risk of committing errors because they are constantly involved with patients. The situation of

nurses is even more difficult because they deal with high-risk patients, who usually require constant medications and care, which predisposes them even more to committing MEs. [10]

These errors significantly compromise the quality of patient care in terms of mortality, morbidity, costs and altered length of stay in hospital. Worldwide, there is great concern about medical errors. According to a World Health Organization report, at least one in 10 patients is affected by medical errors in high-income countries. [11] Nonetheless, most of these errors go unreported in most countries worldwide. There is a problem within a system that should be investigated when the MEs occur. Health organizations can mitigate contributing factors, prevent recurrence of errors, and learn from them by implementing error reporting systems. Furthermore, prevention strategies cannot be developed if errors are not reported. [9,10]

A study by Denning et al. [12] in the United Kingdom reported a significant decrease in reporting of MEs by nurses. The main barriers to reporting can be attributed to fear of responsibility, managerial reactions, lack of knowledge, professional pressures and psychological breakdowns of nurses. Moreover, barriers that nurses perceive to reporting MEs include concerns about the consequences of reporting, including fear of censure and punishment by administration, and that blame will be placed on the individuals responsible rather than the entire system. Administrative reactions include overreaction, emphasising the individual over the system, emphasising mistakes as an indicator of quality of care, and failing to provide encouragement when things go well. [11-14] Almost 70% of nurses are concerned that managers will retaliate if errors are reported due to these responses. [14] There may be differences in attitudes and perceived barriers between ordinary carers and senior carers in relation to reporting ME. Nurses' attitudes and perceived barriers to reporting ME must be understood to increase reporting rates and improve medication safety.

In Saudi Arabia, the problems of unsafe care were found to be more significant due to the lack of adequate knowledge about nurses' attitudes and barriers to reporting MEs and the current systems for reporting MEs. [13] There is, therefore, a need to promote nurses' reporting culture in this regard. The aim of this study was to identify the perceived barriers to ME reporting among nurses in governmental hospitals in Jeddah, Saudi Arabia as well as the possible factors contributing to these errors.

METHODS

Study design, sampling and participants
A cross-sectional web-based study was conducted between February to March 2022 at four government hospitals in Jeddah City, Saudi Arabia. The study population was nurses with a minimum of one year's experience working in Jeddah hospitals who meet the Saudi Commission for Health Specialties registration requirements. Nursing students, interns, and nurses on maternity leave were excluded from this study.

Based on Alreshidi's study,[15] the sample size was estimated using a two-proportion sampling formula $z=(p1-p2)/\sqrt{p(1-p)(1/n1+1/n2)}$, where, P1 = Proportion of medication administration errors of the nurses because of high workload = 11.3% and P2= Proportion of medication administration errors of the nurses because of physicians' poor handwriting = 5.7%. [16] Considering a power of 80%, a confidence level of 95% and an attrition rate of 20% of the subjects, the total sample size was 417 participants.

About 3,760 nurses are working in the four selected hospitals in the different departments and divisions. The sample size was apportioned based on the size of the hospital. The sampling frame was the list of updated working posts of all nurses from the human resources in the selected hospitals. Then the names of nurses in the sampling frame were numbered. A proportional random sampling was used to select the participants according to the density of the nurses in each hospital. The sampling unit was each nurse who met the inclusion criteria. The procedure was carried out until the calculated sample size was achieved. The hospital directors of the selected hospitals distributed consent forms via email to the eligible nurses. All eligible nurses who agreed to participate and signed the informed consent form were included in the study.

Data collection
An online session was conducted during data collection to explain the purpose of the study after the participants provided informed consent. Participants completed an online questionnaire between May to October 2021. The study instrument included an English version of validated questionnaire based on the studies by Yung et al. [17] and Aboshaiqah.[13] The questionnaire consisted of two sections containing sociodemographic and personal data and barriers to reporting MEs. Section 1 included sociodemographic and personal information on age, gender, nationality, marital status, educational level, monthly income, mother tongue, nurse role/occupation, department/ward, experience, hours worked per week and participation in training for ME reporting. Section 2 included the barriers to reporting MEs and consisted of four sections focusing on management behaviour (six items), the system for reporting MEs (eight items), culture-related elements of the system for reporting MEs (eight items) and the barriers that prevent nurses from reporting (eight items). Participants had to rate each item on a five-point

Likert scale (5= strongly agree; 4= agree; 3= not sure; 2= disagree; 1= strongly disagree). The score of barriers to reporting MEs was categorized into three levels based on the mean of the total score at the cut-off points: (1 to less than 2.33 low barriers, 2.33 to less than 3.66 moderate barriers and 3.66 to 5 high barriers). The maximum score was 5 and the minimum was 1 for each dimension. A higher score indicates that the barriers to reporting MEs were greater. The questionnaire was verified for validity and reliability, the internal consistency value was measured using Cronbach's alpha, and the result showed an acceptable level (0.765). In addition, the reliability of the questionnaire was calculated to be 0.81 and 0.86, based on Cronbach's α in previous study in Taiwan. [17]

Ethical considerations

The study was conducted in accordance with the Declaration of Helsinki and the researchers complied with the International Guidelines for Research Ethics, where they obtained ethics committee approval, secured informed consent, and adhered to institutional guidelines. This study was approved by the Ethics Committee for Research Involving Human Subjects (JKEUPM–2021–416) of Universiti Putra Malaysia and the Ministry of Health in Saudi Arabia (H–02–J–002). Before data collection began, all participants received written information about the study and signed written informed consent forms. Before giving consent, participants were given the opportunity to ask questions. All participants had the right to withdraw from this research at any time without giving any reason. They knew this study was confidential, and all information concerning their identities would remain private.

Data analysis

Data were analysed using the Statistical Package for Social Sciences (SPSS) version 25 for Microsoft Windows (Chicago, IL, USA). All missing values and outliers were checked before data analysis. The Kolmogorov–Smirnov test and Skewness and Kurtosis test described the normality of variables among continuous data. In the Kolmogorov-Smirnov test, a p-value > 0.05 means the data is of normal distribution. In terms of Skewness and Kurtosis, the data is normal (-1.96 to +1.96). Descriptive statistics were used to determine means, medians and standard deviations (SD) for continuous variables and frequencies and percentages for categorical variables. A one-way ANOVA was used to determine whether there were significant differences between role/profession and department/unit in terms of perceived barriers to ME reporting. A value of p < 0.05 was considered statistically significant.

RESULTS

In total, 408 nurses responded to the study, with a response rate of 97.8%. Table 1 presents the socio-demographic and personal data of the nurses. Most participants (84.8%) were in the age group 30-40 years old, with a mean (SD) of 34.04 (3.98). Most participants were females (68.9%), non-Saudis (51.2%), married (59.6%) and had a bachelor's degree (68.4%). About two thirds of participants (64.0%) had a monthly income of less than 10,000 SAR. More than half of respondents (57.1%) had Arabic as their first language. Participants from King Fahad Hospital constituted 44.1%, followed by participants from King Abdulaziz Hospital (21.1%), East Jeddah Hospital (17.4%) and King Abdullah Medical Complex (17.4%). Most participants were specialist nurses (63.5%) and worked in the emergency department (34.3%). About 62% of the respondents had 5 to 10 years of work experience. The mean (SD) work experience of the nurses was 9.44 (4.68) years, and the mean (SD) weekly working hours were 51.83 (6.97). Less than two thirds of the participants (62.5%) had attended training on reporting medication errors. The number of ever reported medication errors reporting was 168 (41.2%).

Table 2 shows the association between medication error reporting and nurses' socio-demographic characteristics. There was a significant association between medication error reporting and age group (χ^2=8.440, p =0.015), nationality (χ^2=7.872, p =0.005), monthly income (χ^2 = 15.875, p< 0.001), first language (χ^2 = 6.591, p =0.037), hospital (χ^2=80.174, p< 0.001), department/unit (χ^2=33.450, p< 0.001), and attending a training course on ME reporting (χ^2=15.586, p< 0.001). The results indicate that nurses under 40 years old, non-Saudi nurses, those earning less than 10,000 Saudi Riyals monthly, nurses who speak languages other than Arabic or English, emergency room nurses, and those who have not received training in ME reporting were significantly more reporting MEs.

Table 3 shows the distribution of perceived barriers toward medication error reporting. According to the participants, hindering nurses from reporting medication errors category was the main perceived barriers (mean =4.02; SD= 1.37), followed by culture-related elements of the medication error reporting system (mean =3.38; SD= 1.63), medication error reporting system (mean = 3.37; SD= 1.56) and management behaviours (mean =3.15; SD= 1.60). The top five barriers were lack of knowledge about the process of reporting medication errors, not wanting to punish a colleague or friend, unawareness about the need to report medication errors, unwillingness to take responsibility and the paperwork involved in medication error reporting is burdensome.

Table 1: Socio-demographic and work characteristics of the nurses working in Jeddah governmental hospitals

Variables	Nurses (n=408)	
	Frequency	Percentage
Age (years)		
< 30	42	10.3
30-40	346	84.8
> 40	20	4.9
Mean (SD)	34.04 (3.98)	
Gender		
Male	127	31.1
Female	281	68.9
Nationality		
Saudi	199	48.8
Non-Saudi	209	51.2
Marital status		
Single	110	27.0
Married	243	59.6
Divorced	48	11.8
Widower/Widow	7	1.7
Education level		
College Diploma or below	45	11.0
Bachelor degree	279	68.4
Master degree	81	19.9
Doctoral degree (PhD)	3	0.7
Monthly income (SR)		
< 10000	261	64.0
10000-15000	127	31.1
> 15000	20	4.9
Mean (SD)	8722.18(3470.74)	
First language		
Arabic	233	57.1
English	18	4.4
Others*	157	38.5
Hospital		
King Fahad Hospital	180	44.1
King Abdulaziz Hospital	86	21.1
East Jeddah Hospital	71	17.4
King Abdullah Medical Complex	71	17.4
Role/Profession		
General nurse	104	25.5
Critical care nurse	45	11.0
Specialist nurse	259	63.5
Department/Unit		
Emergency room (ER)	140	34.3
Surgical ward	34	8.3
Medical ward	53	13.0
Intensive care unit (ICU)	130	31.9
Others	51	12.5
Experience in years		
Less than 5	33	8.1
5-10	252	61.8
More than 10	123	30.1
mean (SD)	9.44 (4.68)	
Work weekly hours		
≤40	6	1.5
>40	402	98.5
mean (SD)	51.83 (6.97)	
Attend training course on ME reporting		
Yes	255	62.5
No	153	37.5
Ever reported MEs		
Yes	168	41.2
No	240	58.8

SD= Standard deviation; SR=Saudi Riyal; ME= Medication error; * Others include 79 Tagalog, 19 Urdu, 13 Hindi, 9 Filipino, 7 Sanskrit, 6 Malay, 5 Punjabi, 5 Dogri, 4 Bengali, 2 Nepali 2 Odia, 2 Oriya, 2 Tamil and 2 Telugu.

Table 2: Association between medication error reporting and Jeddah governmental hospital nurses' socio-demographic characteristics

Variables	ME reporting		χ^2	p-value
	Yes	No		
	No. (%)	No. (%)		
Age (years)				
< 30 years old	18(42.9%)	24(57.1%)	8.440	0.015*
30-40 years old	148(42.8%)	198(57.2%)		
> 40 years old	2 (10.0%)	18(90.0%)		
Gender				
Male	47 (37.0%)	80(63.0%)	1.323	0.250
Female	121(43.1%)	160(56.9%)		
Nationality				
Saudi	68 (34.2%)	131(65.8%)	7.872	0.005*
Non-Saudi	100(47.8%)	109(52.2%)		
Marital status				
Single	42 (38.2%)	68(61.8%)	2.063	0.559
Married	99 (40.7%)	144(59.3%)		
Divorced	23 (47.9%)	25(52.1%)		
Widower/Widow	4 (57.1%)	3 (42.9%)		
Education level				
College Diploma or below	15(33.3%)	30 (66.7%)	4.344	0.227
Bachelor degree	115(41.2%)	164(58.8%)		
Master degree	38 (46.9%)	43(53.1%)		
Doctoral degree	0 (0.0%)	3 (100.0%)		
Monthly income (SR)				
< 10000	122(46.7%)	139(53.3%)	15.875	<0.001*
10000-15000	45 (35.4%)	82(64.6%)		
> 15000	1 (5.0%)	19 (95.0%)		
First language				
Arabic	85 (36.5%)	148(63.5%)	6.591	0.037*
English	6 (33.3%)	12 (66.7%)		
Other	77 (49.0%)	80 (51.0%)		
Hospital				
King Fahad Hospital	106(58.9%)	74 (41.1%)	80.174	< 0.001*
King Abdulaziz Hospital	44 (51.2%)	42(48.8%)		
East Jeddah Hospital	16 (22.5%)	55 (77.5%)		
King Abdullah Medical Complex	2 (2.8%)	69 (97.2%)		
Role/Profession				
General nurse	50 (48.1%)	54 (51.9%)	5.963	0.051
Critical care nurse	12 (26.7%)	33 (73.3%)		
Specialist nurse	106(40.9%)	153(59.1%)		
Department/Unit				
Emergency room (ER)	75 (53.6%)	65 (46.4%)	33.450	< 0.001*
Surgical ward	11 (32.4%)	23 (67.6%)		
Medical ward	12 (22.6%)	41 (77.4%)		
Intensive care unit (ICU)	62 (47.7%)	68 (52.3%)		
Others	8 (15.7%)	43 (84.3%)		
Experience in years				
Less than 5	13 (39.4%)	20 (60.6%)	4.883	0.087
5-10	114(45.2%)	138(54.8%)		
More than 10	41 (33.3%)	82 (66.7%)		
Work weekly hours				
≤40	1 (16.7%)	5 (83.3%)	1.510	0.219
>40	167(41.5%)	235(58.5%)		
Attend training course on ME reporting				
Yes	86 (33.7%)	169(66.3%)	15.586	< 0.001*
No	82 (53.6%)	71 (46.4%)		

SD= Standard deviation; SR=Saudi Riyal; ME= Medication error; Significance *p< 0.05, χ^2 = chi-square statistic

Table 3: Perceived barriers toward medication error reporting among Jeddah governmental hospital nurses

Items	Strongly disagree No. (%)	Disagree No. (%	Not sure No. (%	Agree No. (%)	Strongly agree No.(%)	Mean	SD
A. Management behaviors						3.15	1.60
a) Managers take any reaction to the reporting medication errors	99(24.3)	68(16.7)	2(0.5)	56 (13.7)	183(44.9)	3.38	1.71
b) Managers focusing too much on the individual who commits the medical error	109(26.7)	52(12.7)	4(1.0)	51 (12.5)	192(47.1)	3.40	1.75
c) Managers overreacting to medication errors	108(26.5)	59(14.5)	4(1.0)	104 (25.5)	133(32.6)	3.23	1.65
d) Managers blaming the staff member behind the medication error for its occurrence	97 (23.8)	61(15.0)	7(1.7)	48 (11.8)	195(47.8)	3.45	1.71
e) Managers failing to provide feedback	98 (24.0)	78(19.1)	16(3.9)	46 (11.3)	170(41.7)	3.27	1.69
f) Managers finding no benefit associated with reporting of medical errors	198(48.5)	86(21.1)	14(3.4)	43 (10.5)	67 (16.4)	2.25	1.54
g) Managers emphasize that medication errors are a measure of the quality of care provided	135(33.1)	46(11.3)	12(2.9)	92 (22.5)	123(30.1)	3.05	1.69
B. Medication error reporting system						3.37	1.56
a) The medication error reporting system is ineffective	102(25.0)	101(24.8)	8 (2.0)	62 (15.2)	135(33.1)	3.07	1.65
b) The medication error reporting system lacks policies to govern its use	105(25.7)	94 (23.0)	9 (2.2)	74 (18.1)	126(30.9)	3.05	1.64
c) My institution does not have a recording system for medication errors	104(25.5)	93 (22.8)	9 (2.2)	83 (20.3)	119(29.2)	3.05	1.62
d) There are no standards for medication error reporting in my institution	98 (24.0)	99 (24.3)	6 (1.5)	91 (22.3)	114(27.9)	3.06	1.60
e) The medication error reporting system lacks clear definitions	92 (22.5)	96 (23.5)	5 (1.2)	91 (22.3)	124(30.4)	3.14	1.60
f) The medication error reporting system is time consuming	103(25.2)	54 (13.2)	10(2.5)	83 (20.3)	158(38.7)	3.34	1.67
g) The paperwork involved in medication error reporting is burdensome	35 (8.6)	36 (8.8)	7 (1.7)	80 (19.6)	250(61.3)	4.16	1.32
h) I am constantly under immense work pressure to have time to report medication errors	51 (12.5)	23 (5.6)	6 (1.5)	69 (16.9)	259(63.5)	4.13	1.41
C. Culture-related elements of the medication error reporting system						3.38	1.63
a) The unit/department where I work does not really emphasize on medication error reporting	107(26.2)	84 (20.6)	6 (1.5)	61 (15.0)	150(36.8)	3.15	1.69
b) The unit/department where I work does not have effective quality management processes to support medication error reporting	96 (23.5)	88 (21.6)	4 (1.0)	69 (16.9)	151(37.0)	3.22	1.66
c) We are too understaffed to have the capacity to report medication error	56 (13.7)	48 (11.8)	7 (1.7)	84 (20.6)	213(52.2)	3.86	1.49
d) The relationship between the different hospital staff (nurses, physicians, pharmacists, etc.) hinders medication error reporting at my hospital workplace	99 (24.3)	71 (17.4)	11(2.7)	86 (21.1)	141(34.6)	3.24	1.64
e) The hospital culture hinders medication error reporting	86 (21.1)	83 (20.3)	12(2.9)	74 (18.1)	153(37.5)	3.31	1.62
f) The implementations of quality improvements that cause culture change at my hospital workplace make medication error reporting difficult	81 (19.9)	91 (22.3)	6 (1.5)	64 (15.7)	166(40.7)	3.35	1.64
g) The power hierarchy in my hospital workplace hinders medication error reporting	71 (17.4)	85 (20.8)	10(2.5)	65 (15.9)	177(43.4)	3.47	1.61
h) I lack trust in the hospital where I work about how medication error reports would be used	90 (22.1)	73 (17.9)	6 (1.5)	41 (10.0)	198(48.5)	3.45	1.70
D. Hindering nurses from reporting medication errors						4.02	1.37
a) Inability to identify or recognize medication errors	80 (19.6)	51 (12.5)	4 (1.0)	86 (21.1)	187(45.8)	3.61	1.61
b) Not wanting to admit that a medication error has occurred	60 (14.7)	47 (11.5)	5 (1.2)	80 (19.6)	216(52.9)	3.85	1.52
c) Unwillingness to take responsibility	32 (7.8)	35 (8.6)	4 (1.0)	82 (20.1)	255(62.5)	4.20	1.28
d) Unawareness about the need to report medication errors	27 (6.6)	28 (6.9)	3 (0.7)	80 (19.6)	270(66.2)	4.32	1.20
e) Some medication errors are not too serious as require reporting	128(31.4)	55 (13.5)	9 (2.2)	64 (15.7)	152(37.3)	3.14	1.74
f) Previous experiences after committing medication errors and getting into trouble	35 (8.6)	39 (9.6)	12(2.9)	70 (17.2)	252(61.8)	4.14	1.34
g) Not wanting to punish a colleague or friend	24 (5.9)	29 (7.1)	5 (1.2)	77 (18.9)	273(66.9)	4.34	1.18
h) Lack of knowledge about the process of reporting medication errors	19 (4.7)	25 (6.1)	4 (1.0)	37 (9.1)	323(79.2)	4.52	1.09

SD= Standard deviation

Table 4 shows the results regarding the level of perceived barriers to ME reporting among nurses, with a remarkable 51.7% of participants reporting a high level of perceived barriers. This is followed by 25.5% who indicated a moderate level and 22.8% who reported a low level of perceived barriers toward ME reporting.

Table 5 shows the barriers to reporting on ME, as perceived by role/profession and department/unit. Significant differences were found between nurses' role/profession and management behaviour (F= 20.620, $p < 0.001$), medication error reporting system (F= 23.212, $p < 0.001$), culture-related elements of medication error reporting system (F= 26.839, $p<$

0.001) and hindering nurses from reporting medication errors (F= 5.601, p =0.004). A Tukey's post-hoc test determined that the general nurse group was statistically more likely to cite management behaviour, the medication error reporting system, culture-related elements of the medication error reporting system and hindering nurses reporting medication errors as barriers to ME reporting than the other group. In addition, there were significant differences between departments/units and management behaviour (F= 11.436, p < 0.001), medication error reporting system (F= 13.240, p < 0.001), culture-related elements of

medication error reporting system (F= 14.964, p < 0.001) and hindering nurses from reporting medication errors (F= 4.734, p = 0.001). A Tukey post hoc test revealed that the surgical ward was statistically more likely than the other group to report that management behaviour and hindering nurses from reporting medication errors were barriers to ME reporting. At the same time, the emergency department was statistically more likely than the other group to report that the medication error reporting system and culture-related elements of the medication error reporting system were barriers to ME reporting.

Table 4: The level of perceived barriers toward medication error reporting among Jeddah governmental hospital nurses

Items	Frequency	Percentage	Mean ± SD
Management behaviors			3.15 ± 1.60
Low	144	35.3	
Moderate	63	15.4	
High	201	49.3	
Medication error reporting system			3.37 ± 1.56
Low	113	27.7	
Moderate	99	24.3	
High	196	48.0	
Culture-related elements of the medication error reporting system			3.38 ±1.63
Low	135	33.1	
Moderate	59	14.5	
High	214	52.5	
Hindering nurses from reporting medication errors			4.02 ± 1.37
Low	47	11.5	
Moderate	67	16.4	
High	294	72.1	
All perceived barriers			3.49 ±1.12
Low	93	22.8	
Moderate	104	25.5	
High	211	51.7	

SD= Standard deviation

Table 5: Jeddah governmental hospital nurses' perceived barriers to medication error reporting by role/profession and department/unit

Items	Management behaviors			Medication error reporting system			Culture-related elements of the medication error reporting system			Hindering nurses from reporting medication errors		
	Mean (SD)	F	p value	Mean (SD)	F	p value	Mean (SD)	F	p value	Mean (SD)	F	p value
Role/Profession												
General Nurse	3.79 (1.48)	20.620	< 0.001*	4.66 (1.61)	23.212	< 0.001*	4.23(1.52)	26.839	< 0.001*	4.30 (1.26)	5.601	0.004*
Critical Care Nurse	3.05 (1.59)			3.45 (1.66)			3.10(1.71)			4.00 (1.32)		
Specialist Nurse	2.91 (1.56)			3.61 (1.81)			3.10(1.88)			3.90 (1.42)		
Department/Unit												
Emergency room	3.51 (1.42)	11.436	< 0.001*	3.84 (1.52)	13.240	< 0.001*	3.93(1.60)	14.964	< 0.001*	4.19 (1.28)	4.734	0.001*
Surgical ward	3.56 (1.50)			3.71 (1.51)			3.69(1.83)			4.24 (1.27)		
Medical ward	3.03 (1.75)			3.18 (1.62)			3.10(1.83)			3.79 (1.39)		
Intensive care unit	3.04 (1.59)			3.21 (1.61)			3.25(1.77)			4.04 (1.42)		
Others	2.28 (1.52)			2.51 (1.53)			2.30(1.63)			3.55 (1.48)		

SD= Standard deviation; Significance *p< 0.05

DISCUSSION

Our study examined the perceived barriers to reporting medication errors (MEs) among nurses working in governmental hospitals in Jeddah, Saudi Arabia. Using the one-way ANOVA model, differences in perceived barriers to ME reporting were analysed by function, profession and department/unit. Actions need to be identified to improve reporting based on the ME reporting barriers that nurses face while considering relevant theories of behaviour change. [18-20]

An ME reporting system will be useful and effective if

nurses are enabled and encouraged to report any ME, regardless of severity or near misses. [21] These reports help in the early detection of patient safety problems. [22] According to the results of the current study, 41.2% of the nurses had never reported MEs during their employment. As a result, there is less opportunity to learn from the past and act on ME reports, as this condition makes it difficult to identify the true causes of the problem. Similarly, these findings [23, 24] showed that respondents reported little regarding ME reporting, suggesting that underreporting while revealing this may be a widespread culture in primary care clinics.

The top five perceived barriers to ME reporting by nurses in our study were lack of knowledge about the ME reporting process, not wanting to punish a colleague or friend, lack of awareness about the need to report MEs, unwillingness to take responsibility and the burdensome paperwork involved in ME reporting. Similar findings have been reported in several other studies in primary care, with the most common barriers being lack of expertise, workload and time. [25, 26] Nurses' propensity to report MEs is influenced by their busy schedules and the need for more understanding of the ME reporting process. These results were confirmed by other studies conducted in different contexts. [24, 27, 28] The results differ from those of a study conducted in a primary care clinic, which found that respondents were not influenced by workload when it came to reporting MEs. (30) Unclear reporting procedures were also identified in this study as another significant barrier to reporting MEs. In this study, the participants collectively perceived management behaviours as barriers to reported MEs. These findings are supported by similar results in other studies. [31, 32] Also, blaming and focusing on individuals, rather than looking at systems, were identified as possible barriers to reporting MEs. Similarly, in a study supporting the current findings, managers who placed too much emphasis on the person who committed MEs demonstrated an aversive management style. Poor managerial behaviour has been associated with an adversarial leadership style. [33] Another study reported that perceived adverse reactions to mistakes tend to be associated with defensive changes. This contributes to errors not being reported because nurses tend to resort to avoidance behaviours. [34] Also, inadequate support for a non-punitive error reporting culture and error-prone situational corrections were identified as administrative contributors to barriers to safe medication administration. [35] Another study found that responding to errors without punishment was ranked low among respondents, [36] suggesting that staff feel they are held accountable for errors committed. The healthcare administrators should recognize the need to shift from punitive behaviours to a more educational and supportive framework to improve ME reporting. This transition is crucial for enhancing reporting rates, improving patient safety, and optimizing overall hospital performance.

There are some limitations to this study. This is a cross-sectional survey subject to the typical limitations of questionnaire-based research. These limitations may have resulted in inaccurate data, including participant recall bias, social desirability bias, response bias via the online and communication difficulties between researchers and participants. Furthermore, the study results cannot be generalised to the entire Saudi healthcare population, as the study was conducted in four governmental hospitals in Jeddah. Future studies could be conducted to explore the barriers to reporting MEs involving more hospitals and healthcare workers.

CONCLUSION AND RECOMMENDATIONS

This study quantified the main barriers to ME reporting from nurses' perspectives in four governmental hospitals in Jeddah. Non-reporting of MEs is a complex problem involving management behaviour, the reporting system and the culture of the nursing staff. More research is needed to understand and identify the causes of unreported MEs. Nurses should be aware that they are responsible for the consequences of their decisions and actions. Various proponents of patient safety have advocated the creation of a non-blaming environment to help improve quality and safety outcomes. The factors influencing unreported MEs may need to be identified and addressed per hospital, as solutions and strategies need to be formulated and implemented accordingly. The results of this study may be utilized to establish or enhance ME reporting systems, which might influence patients' safety.

REFERENCES

1. World Health Organization. Medication without harm. Geneva: WHO; 2022. [Retrieved 2024 January 27]. Available at: https://www.who.int/initiatives/medication-without-harm#:~:text=Medication%20errors%20occur%20when

%20weak,harm%2C%20disability%20and%20even%20 death.

2. Ambwani S, Misra AK, Kumar R. Medication errors: Is it the hidden part of the submerged iceberg in our health-care system?. Int J Appl Basic Med Res. 2019;9(3):135. http://dx.doi.org/10.4103/ijabmr.IJABMR_96_19

3. Magalhães AM, Kreling A, Chaves EH, Pasin SS, Castilho BM. Medication administration–nursing workload and patient safety in clinical wards. Rev Bras Enferm. 2019;72:183–9. https://doi.org/10.1590/0034-7167-2018-0618

4. Tsegaye D, Alem G, Tessema Z, Alebachew W. Medication administration errors and associated factors among nurses. Int J Gen Med 2020;22:1621–32. https://doi.org/10.2147/IJGM.S289452

5. Tariq RA, Vashisht R, Sinha A, Scherbak Y. Medication Dispensing Errors and Prevention. 2024. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing. https://www.ncbi.nlm.nih.gov/books/NBK519065/

6. Roehr B. Institute of Medicine report strives to reduce medication errors. BMJ. 2006;333(7561):220. https://doi.org/10.1136/bmj.333.7561.220-f

7. Elliott R, Camacho E, Campbell F, Jankovic D, St James MM, Kaltenthaler E, et al. Prevalence and economic burden of medication errors in the NHS in England. EEPRU. 2018; 22(2)1–147.

8. Barakat S, Franklin BD. An evaluation of the impact of barcode patient and medication scanning on nursing workflow at a UK teaching hospital. Pharmacy. 2020;8(3):148. https://doi.org/10.3390/pharmacy8030148

9. Poon EG, Keohane CA, Bane A, Featherstone E, Hays BS, Dervan A, et al. Impact of barcode medication administration technology on how nurses spend their time providing patient care. J Nurs Adm. 2008;38(12):541–9. https://doi.org/10.1097/NNA.0b013e31818ebf1c

10. Yuan CT, Nembhard IM, Kane GC. The influence of peer beliefs on nurses' use of new health information technology: A social network analysis. Soc Sci Med. 2020;255:113002. https://doi.org/10.1016/j.socscimed.2020.113002

11. World Health Organization. Patient safety. Geneva: WHO; 2019. [Retrieved 2023 March 17]. Available at: https://www.who.int/news-room/fact-sheets/detail/patient-safety

12. Denning M, Goh ET, Scott A, Martin G, Markar S, Flott K, et al. What has been the impact of COVID-19 on safety culture? A case study from a large metropolitan healthcare trust. Int J Environ Res Public Health. 2020;17(19):7034. http://dx.doi.org/10.3390/ijerph17197034

13. Aboshaiqah AE. Barriers in reporting medication administration errors as perceived by nurses in Saudi Arabia. Middle-East J Sci Res. 2013;17(2):130–6.

14. Alsulami SL, Sardidi HO, Almuzaini RS, Alsaif MA, Almuzaini HS, Moukaddem AK, et al. Knowledge, attitude and practice on medication error reporting among health practitioners in a tertiary care setting in Saudi Arabia. Saudi Med J. 2019;40(3):246. http://dx.doi.org/10.15537/smj.2019.3.23960

15. Alreshidi T. Registered nurses' perceptions of medication administration errors and their management in Saudi Arabian hospitals. [PhD's thesis]. [United Kingdom]: University of Salford; 2016.

16. Lemeshow S, Hosmer D, Klar W, Lwanga K. Adequacy of sample size in health studies. Massachusetts: Wiley Press; 1990.

17. Yung HP, Yu S, Chu C, Hou IC, Tang FI. Nurses' attitudes and perceived barriers to the reporting of medication administration errors. J Nurs Manag. 2016;24(5):580–8. https://doi.org/10.1111/jonm.12360

18. Afaya A, Konlan KD, Kim Do H. Improving patient safety through identifying barriers to reporting medication administration errors among nurses: An integrative review. BMC Health Serv Res. 2021;21:1156. https://doi.org/10.1186/s12913-021-07187-5

19. Alrasheeday AM, Alkubati SA, Alrubaiee GG, Alqalah TA, Alshammari B, Abdullah SO, Loutfy A. Estimating Proportion and Barriers of Medication Error Reporting Among Nurses in Hail City, Saudi Arabia: Implications for Improving Patient Safety. J. Multidiscip. Healthc 2024;17:2601–2612. https://doi.org/10.2147/JMDH.S466339

20. Aljabari S, Kadhim Z. Common barriers to reporting medical errors. Sci World J. 2021;2021(1):6494889. https://doi.org/10.1155/2021/6494889

21. World Health Organization. Reporting and learning systems for medication errors: the role of pharmacovigilance centres. WHO: Geneva; 2014.

22. National Patient Safety Foundation. RCA2: Improving root cause analyses and actions to prevent harm. Boston: NPSF; 2015.

23. Rashed A, Hamdan M. Physicians' and nurses' perceptions of and attitudes toward incident reporting in Palestinian hospitals. J Patient Saf. 2019;15(3):212–7. https://doi.org/10.1097/PTS.0000000000000218

24. Stewart D, Thomas B, MacLure K, Wilbur K, Wilby K, Pallivalapila A, et al. Exploring facilitators and barriers to medication error reporting among healthcare professionals in Qatar using the theoretical domains framework: A mixed-methods approach. PloS one. 2018;13(10):e0204987. https://doi.org/10.1371/journal.pone.0204987

25. Wondmieneh A, Alemu W, Tadele N, Demis A. Medication administration errors and contributing factors among nurses: A cross sectional study in tertiary hospitals, Addis Ababa, Ethiopia. BMC Nurs. 2020;19(1):1–9. https://doi.org/10.1186/s12912-020-0397-0

26. Kousgaard MB, Joensen AS, Thorsen T. Reasons for not reporting patient safety incidents in general practice: A qualitative study. Scand J Prim Health Care. 2012;30(4):199–205. https://doi.org/10.3109/02813432.2012.732469

27. Prang IW, Jelsness-Jørgensen LP. Should I report? A qualitative study of barriers to incident reporting among nurses working in nursing homes. Geriatr Nurs. 2014;35(6):441–7. https://doi.org/10.1016/j.gerinurse.2014.07.003

28. Waaseth M, Ademi A, Fredheim M, Antonsen MA, Brox NMB, Lehnbom EC. Medication errors and safety culture in a Norwegian Hospital. Stud Health Technol Inform. 2019;265:107–12. http://dx.doi.org/10.3233/SHTI190147

29. Hartnell N, MacKinnon N, Sketris I, Fleming M. Identifying, understanding and overcoming barriers to medication error reporting in hospitals: A focus group study. BMJ Qual Saf. 2012;21(5):361–8. http://dx.doi.org/10.1136/bmjqs-2011-000299

30. Teoh B, Alrasheedy A, Hassali M, Tew M, Samsudin M. Perceptions of doctors and pharmacists towards medication error reporting and prevention in Kedah, Malaysia: A Rasch model analysis. Adv Pharmacoepidemiol Drug Saf. 2015;4(192):1052–2167. http://dx.doi.org/10.4172/2167-1052.1000192

31. Petrova E, Baldacchino D, Camilleri M. Nurses' perceptions of medication errors in Malta. Nursing Standard. 2010;24(33):41. http://dx.doi.org/10.7748/ns2010.04.24.33.41.c7717

32. Patrician PA, Brosch LR. Medication error reporting and the work environment in a military setting. J Nurs Care Qual. 2009;24(4):277–86. http://dx.doi.org/10.1097/NCQ.0b013e3181afa4cb

33. Specchia ML, Cozzolino MR, Carini E, Di Pilla A, Galletti C, Ricciardi W, et al. Leadership styles and nurses' job satisfaction. Results of a systematic review. Int J Environ Res Public Health 2021;18(4):1552. https://doi.org/10.3390/ijerph18041552

34. Karga M, Kiekkas P, Aretha D, Lemonidou C. Changes in nursing practice: Associations with responses to and coping with errors. J Clin Nurs. 2011;20(21-22):3246–55. http://dx.doi.org/10.1111/j.1365-2702.2011.03772.x

35. Lewis L. Discussion and recommendations: Safe medication administration: An invitational symposium recommends ways of addressing obstacles. J Infus Nurs. 2005;28(1):42–7. http://dx.doi.org/10.1097/00000446-200503001-00009

36. Bahrami MA, Montazeralfaraj R, Chalak M, Tafti AD, Tehrani GA, Ardakani SE. Patient safety culture challenges: Survey results of Iranian educational hospitals. Middle East J Sci Res. 2013;14(5):641–9. https://doi.org/10.5829/idosi.mejsr.2013.14.5.7289