Ann. For. Res. 65(1): 11855-11868, 2022
ISSN: 18448135, 20652445

ANNALS OF FOREST RESEARCH
https://www.e-afr.org/

FACTORS AFFECTING MEDICATION ERRORS REPORTING AMONG NURSES IN SELECTED PRIVATE HOSPITALS IN JEDDAH

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Abstract

Background: Medication errors are a global concern and key challenges that threatening the safety of patients in all countries. **Aim:** this study aimed to determine factors affecting medication errors reporting among nurses in selected private hospitals in Jeddah. **Methods**: A convenient sample of 140 nurses was selected from the private hospitals at Jeddah, Saudi Arabia. **Design**: The study utilized a cross sectional design. **Tool**: Predesigned questionnaires sheet composed of 2 parts, part one consists of demographic characteristics of studied sample. Part 2 consists of the factors affecting in reporting medication errors. **Result:** Approximately third of the studied nurses have strongly disagreeing the fear factor of the consequences of reporting medication errors or there's no fear of reporting whatever the consequences since the nursing staff had been practicing in reporting any medication errors incident in their respected clinical areas. Likewise, in managerial factors nurses believed that the implementation medication errors reporting was effective, and the occurrence of such error was preventive. On the other hand, the factors related process of reporting medication errors great numbers of the participants' having poor medication knowledge and the poor calculation skills. **The study concluded that** a highly significant correlation was found between all factors leading to medication error and sociodemographic characteristics mainly in items of gender, and level of education level. While there was a significant correlation between fear of the consequence of reporting and all sociodemographic characteristics items

Recommendation: Healthcare Professionals and patients should motivate in reporting the occurrence of errors to prevent from further harm.

Key words: Medication errors, Nurses, Private hospitals

Introduction

Medication error is a multifactorial problem that primarily consists of failure or avoidance of administration with potentially life-threatening consequences for the patient (Alandajani et al.,

2022). Patient Safety is the highest priority in all healthcare facilities and nurses play a significant role in preventing medication errors and implementing a report (2017). The incident of medication error will happen when there is negligence, omission & commission in prescribing, dispensing, preparing & administering of the drugs. These issues have been raise always due to the high incidence of medication errors but there are only a handful of reports received (World Health Organization, 2016).

Medication error reporting is a significant tool used to monitor the incidence of error and to prevent the occurrence of such errors that lead to potentially harmful results even the death of a particular human being or patient. National Coordinating Council for Medication Error Reporting and Prevention (2019). A medication error is defined as any preventable event that may cause or result in the use of an inappropriate drug or harm to a patient while the drug is under the control of a healthcare professional, patient, or consumer. Such events may be related to professional practice, healthcare products, procedures, and systems, including prescriptions, product labeling, order communication, packaging, labeling, formulation, administration, dispensing, distribution, education, monitoring, and use.

In a country like Saudi Arabia with multicultural backgrounds and high employment of foreign healthcare professionals in institutional and non-institutional health sectors, the problem of medication errors and patient safety is of great concern. The poor knowledge of medicines was a contributory factor in both doctors (prescribers) and nurses (administering drugs) in Middle Eastern countries and indicated that educational programs for prescribers and nurses were needed to avoid drug errors and to improve patient safety (Alsulami et al., 2018).

An efficient medication error reporting system is the backbone of reliable practice and a measure of progress towards achieving safety. Improvement efforts and system change in medication error reporting systems should be targeted toward reductions in the likelihood of injury to future patients. In addition a successful medication error reporting program should be safe for the reporter, and result in constructive and useful recommendations and effective changes while being inclusive of everyone and supported with required resources. Health organizations need to adopt an effectual reporting environment for the medication use process in order to advance into a sounder practice (Al Mutair, et al., 2021).

The Institute for Safe Medication Practices (ISMP 2021) mentioned in their feature articles that error reporting (including close calls) is a fundamental component of a safety culture, encouraging healthcare workers to submit reports is no easy task given the potential disincentives to reporting. First, reactions to making errors vary, but candid confessions of mistakes are not particularly comfortable. In fact, people have a natural desire to forget that the incident ever happened. Even if healthcare workers are willing to speak up about errors, they may still believe that the extra work is not worth their time if they perceive no benefit will come from reporting, especially if they experience error fatigue due to inevitable and recurring errors that seem to never be addressed. They may be even less likely to report if the reporting process is time-consuming, confusing, or complex. Second, healthcare workers may not consider reporting to be a priority,

especially if the error was captured and corrected before it reached a patient, as with close call reference (Alandajani et al., 2022). .

Finally, the likelihood of reporting is highly dependent on the degree of psychological safety felt by healthcare workers. The workforce is understandably reluctant to report errors if they are worried that the information will get them or their colleagues in trouble, legally or socially, impact their job or working relationships with others, or lead to the perception of being careless, incompetent, or an informant (ISMP 2021).

Nurses are more susceptible to making medication errors due to the increasing demands and pressures placed on them. Nurses who work in hospitals with inadequate human resources and have more working hours are more likely to commit errors and the quality of health care depends to a great extent on nurses. Critical incidents must be detected and reported and become positive situations, from which lessons are learned and wont to design better patient care practices and systems. Thus far nurses are at the battlefront of defense to intercept and report medication errors (Alandajani et al., 2022).

Nurses are the largest group of medical professionals, and they are the major responsible persons for giving medication. Therefore, the quality of health care is highly dependent on nurses, and improving patient safety and learning from errors relies on voluntary error reporting which provides the entire picture of medication errors. Thus, exploration of the proportion of nurses reporting medication errors and associated factors is vital to tell service providers, program implementers, and policymakers to enhance the standard of the healthcare service (Jember, A., et al. 2018). Therefore the aim of our study is to determine factors affecting medication error reporting among nurses in selected private hospitals in Jeddah.

MATERIALS AND METHOD:

The aim of current study

This study aimed to determine factors affecting medication errors reporting among nurses in selected private hospitals in Jeddah.

STUDY DESIGN

The study utilized a cross sectional design to determine the factors affecting medication errors reporting in the selected private hospitals in Jeddah.

Population and Sampling

A convenient sample technique was used to select 140 nurses from all the units in selected private hospitals in Jeddah who were willing to participate in the study. The staff nurses voluntarily participated in the study through online Google form. The researchers using the online sample size calculator for cross sectional study with 5% confidence interval and 95% confidence level.

The tool for data collection

A questionnaire for structured interviews was adopted **Bahadori et al., 2013** and modified by researchers after reviewing the relevant literature it was written in simple Arabic it composed of 2 parts:

Part 1: Demographic characteristics of the studied sample including 6 questions such as age, gender, level of education, years of experience in clinical setting and the previous training about medication error.

Part 2: Factors affecting in reporting medication error including 4 sections such as fear of the consequences of reporting, managerial factors, factors related to the process of reporting, and nurses factors. The scoring system depend on 5-point Likert scale ranging from (strongly disagree=1), 2 (disagree=2), (Neutral 3), (agree=4) to (strongly agree=5). Favorable perception is ≥ 60% of total score.

Reliability:

The reliability of the instruments was used to delimit the extent to which items in the questionnaire were interrelated to each other. It was computed by Cronbach's alpha 0.80

Validity:

For validity assurance, the instrument was provided to three juries including two professor of Pediatrics, and three professors of pediatric nursing for their feedback on content, set-up, and order. The modifications were done to ascertain the relevance and completeness.

Ethical considerations:

Local permission from IRRB and local acceptance letter from vice dean. Permission to carry out the study from responsible authorities after explanation of the purpose of the study was obtained; the target participants rest assured that participation in the study was voluntarily. Informed consent was obtained from those who accepted to take part in the study. The confidentiality of collected data was maintained.

Pilot study:

A Pilot study was conducted on 10 % (14 nurses) of the sample selected and interviewed to test the applicability, clarity, and feasibility of the tools to determine the needed time to fill each sheet.

Data collection:

Official permission was obtained from the hospital director after giving an official letter from the Dean of the Faculty of Nursing outlining the purpose of the study. The data for this study was collected through predesigned questionnaires. The Questionnaires were distributed through online survey last year 2021 that composed of 2 parts to determine the factors affecting the medication error reporting among nurses in selected private hospital in Jeddah.

Statistical analysis

The data were coded and analyzed using the computer assisted statistical software (SPSS version 22 software). Continuous variables were presented as mean ± SD if they were statistically normally distributed and categorize variable as numbers and percentages. $P < 0.05$ will be accepted as significant.

Results:

Table 1: Distribution of nurses' socio-demographic factors (No=140)

Variables	Frequency	Percentage
1. **Age**:		
18-29	26	18%
30-49	106	76%
50 & above	8	6%
2. **Gender**:		
Male	6	4.3
Female	134	95.7
3.Level of Education		
Diploma	38	27%
Bachelor degree	94	67%
Master's degree	8	6%
4.Working Experience		
Less than 5 years	20	14.3%
6-10 years	48	34.3%
more than 11 years	72	51.4%
5.Previous Training on Medication Error reporting		
No	46	32.9%
Yes	94	67.1%

Table 1 shows that 76% of the study sample in the age group between 30 - 49 years old, 95.7% of the studied sample were female. Regarding the level of education, 67% of the participants had a bachelor's degree. 51.4% of the work experience of the participants was 11 years and over. Furthermore, 67.1% of the nurses had previous training in medication errors, while 33% had no training in reporting medication errors.

Table 2: Percentage distribution of the studied sample according to fear of the consequence of reporting

Fear of the consequences of reporting	Strongly disagree 1(%)	Disagree 2(%)	Neutral 3(%)	Agree 4(%)	Strongly Agree 5(%)	Total N=140
Fear of the impact of reporting of errors on the personnel's annual evaluation	32.9%	21.4%	14.3%	25.7%	5.7%	100%
	46	30	20	36	8	140
Fear of the impact of reporting of errors on their salary and benefits	30%	24.4%	14.3%	25.7%	5.7%	100%
	42	34	20	36	8	140
Fear of being blamed by nursing heads	30%	18.6%	11.4%	30%	10%	100%
	42	26	16	42	14	140
Fear of being blamed by doctors	27.1%	22.9%	11.4%	31.4%	7.2%	100%
	38	32	16	44	10	140
Fear of being blamed by colleagues	25.7%	20%	15.7%	31.4%	7.2%	100%
	36	28	22	44	10	140
Fear of causing side effects	30 %	15.7%	15.7%	22.9%	15.7%	100%
	42	22	22	32	22	140
Fear of describing them as being Inefficient and inadequate nurses	28.6%	21.4%	11.4%	22.9%	15.7%	100%
	40	30	16	32	22	140
Fear of peer behavior	31.4%	17.1%	18.7%	27.1%	5.7%	100%
	44	24	25	38	8	140
Fear of expressing a negative attitude towards the nurse(s) making errors	31.4%	17.1%	18.7%	27.1%	5.7%	100%
	44	24	25	38	8	140
Fear of judicial issues following reporting on medication errors	31.4%	18.6%	15.7%	24.3%	10%	100%
	44	26	22	34	14	140
Fear of informing colleagues working in other units and other facilities about one's medication error	31.4%	21.4%	11.4%	28.6%	7.2%	100%
	44	30	16	40	10	140

Table 2: revealed that 30% of participants' nurses agree regarding fear of being blamed by nursing heads. Also, 31.4 % of them agree with the fear of blaming by doctors & colleagues if they reported the occurrence of medication errors in the clinical area. Moreover, 32.9% of the participants' nurses strongly disagree with fear of the impact of reporting errors on the personnel's annual evaluation. 30 % of the participants strongly disagree mainly with the items of the fear of the impact of reporting errors on their salary and benefits, fear of causing side effects to the patient, and fear of being blamed by nursing heads. Regarding the other factors like fear of peer behavior, negative

attitudes, judicial issues, and informing colleagues working in other areas or facilities had the same percentage (31.4 %) of participants nurses disagree strongly.

Table 3: Percentage distribution of studied sample according to the managerial factors:

Managerial factors	Strongly disagree 1(%)	Disagree 2(%)	Neutral 3(%)	Agree 4(%)	Strongly Agree 5(%)	Total N=140
Lack of receiving positive feedback from the nursing heads following to report on medication errors	24.3%	18.6%	24.3%	25.7 %	7.2%	100%
	34	26	34	36	10	140
False beliefs in nursing heads and managers	21.4%	24.3%	25.7%	18.6 %	10%	100%
	30	34	36	26	14	140
The heads' focus only on finding the culprits and blaming them, regardless of other factors involved in the occurrence of errors	27.1%	25.7%	12.9%	17.1	11.4%	100%
	38	44	18	24	16	140
The superiors' reactions to the seriousness of the mistake varied	21.4%	18.6%	21.4%	25.7	12.9%	100%
	30	26	30	36	18	140

Table 3: shows the opinion of studied sample according to the managerial factors. It revealed that 25.7% of participant nurses agree about the lack of receiving positive feedback from nursing heads following to report on medication errors, and the superiors' reactions to the seriousness of the mistake varied. While 25.7% of participants are neutral in their opinion about false beliefs in nursing heads and managers. Moreover, 27.1% of participant strongly disagree regarding the heads' focus only on finding the culprits and blaming them, regardless of other factors involved in the occurrence of errors.

Table 4: Distribution of studied sample according to medical factors affecting the incidence of nursing medication errors

Medical factors affecting the incidence of nursing medication errors	Strongly disagree 1(%)	Disagree 2(%)	Neutral 3(%)	Agree 4(%)	Strongly Agree 5(%)	Total
Large variety of drugs in the medical cabinet	22.9%	11.4%	20%	30%	15.7%	100%
	32	16	28	42	22	140
Different medical dosages	25.7%	4.3%	21.4%	28.6%	20%	100%
	36	6	30	40	28	140
Using acronyms of names	21.4%	15.7%	18.6%	30%	14.3%	100%
	30	33	25	42	20	140

Medication package/similarity (LASA)	24.3%	8.6%	14.3%	31.4%	21.4%	100%
	34	12	20	44	30	140

Table 4: shows the distribution of studied sample according to medical factors affecting the incidence of nursing medication errors. It showed that 30% of studied sample agreed that large variety of drugs in the medical cabinet and using acronyms of names. While 28.6% of the participant agree regarding the different medical dosages. Moreover, 31.4% of studied sample agreed about medication package/similarity (LASA) are affecting the incidence of nursing medication errors.

Table (5) Distribution of Human factors leading to medication errors

Types of human factors	**Strongly disagree 1(%)**	**Disagree 2(%)**	**Neutral 3(%)**	**Agree 4(%)**	**Strongly Agree 5(%)**	**Total**
Lack of pharmacological knowledge	21.4%	15.7%	18.6%	30%	14.3%	100%
	30	33	25	42	20	140
Inattention and negligence	25.7%	12.9%	25.7%	21.4%	14.3%	100%
	36	18	36	30	20	140
Physician factors	21.4%	11.4%	30%	27.2%	10%	100%
	30	16	42	38	14	140
Physicians change orders	15.7%	17.1%	28.6%	28.6%	10%	100%
	22	24	40	40	14	140
Nurse-physician factors	21.4%	14.3%	30%	28.6%	5.7%	100%
	30	20	42	40	8	140
Poor relationship between nurses and physicians	22.9%	14.3%	18.6%	34.2%	10%	100%
	32	20	26	48	14	140
Nurse patients' ratio	22.9%	5.7%	18.6%	35.7%	17.1%	100%
	32	8	26	50	24	140

Table (5) showed 30% of the studied sample agreed that lack of pharmacological knowledge, 34.2% of them agreed that poor relationship between nurses and physicians, and 35.7% of them agreed that nurse patients ratio is the human factor leading to medication errors. Regarding inattention and negligence factors 25.7% of participants disagree and the same percentage had a neutral opinion. Also, 28.6% of participant nurses agree about having physicians change orders the same percentage had a neutral opinion. Moreover, 30% of them had a neutral opinion about physician factors and nurse-physician factors leading to medication errors.

Table (6) The correlation between all factors leading to medication errors and sociodemographic characteristics

Variables	N	Fear of the consequence of reporting	Managerial factors	Medical factors affecting the incidence of nursing medication errors	Human factors leading to medication errors
		P- value	**P- value**	**P- value**	**P- value**
1. **Age**:					
18-29	26	0.010*	0.361	0.869	0.532
30-49	106				
50 & above	8				
2. **Gender**:					
Male	6	0.029*	0.009*	0.001*	0.003*
Female	134				
3.Level of Education:					
Diploma	38	0.005*	0.000*	0.000*	0.001*
Bachelor's degree	94				
Master's degree	8				
4.Working Experience:					
Less than 5 years	20	0.000*	0.363	0.721	0.094
6-10 years	48				
More than 11 years	72				
5.Previous Training on Medication Error reporting:					
No	46	0.001*	0.564	0.884	0.082
Yes	94				

Table (6): Reflected a highly significant correlation was found between all factors leading to medication error and sociodemographic characteristics mainly in items of gender, and level of

education level. While there was a significant correlation between fear of the consequence of reporting and all sociodemographic characteristics items with a p-value (0.010, 0.029, 0.000,0.001) respectively.

Discussion

Medication errors can have a significant impact on patient safety and cost of care, and put patients and their families at risk. A nurse's main professional goal is to ensure and improve human health. Medication errors are one of the most common health-threatening errors that compromise patient care. Such errors are considered a global problem, increasing mortality, length of stay and associated costs. This study was conducted to evaluate factors affecting medication errors reporting among nurses in selected private hospitals in Jeddah.

Regarding demographic characteristic of studied sample, it was revealed that the majority of the participants were female, with the age group between 30 – 49 years, and the majority of them also had bachelor's degrees. This was agreed with **Aly et.al., 2022, and Alshammari et al., 2021** who mentioned that most of the respondents were younger than 40 years old. The current study result is supported by **Alandajani et al., 2022** who mentioned that most of the nurses were females and nurses had a bachelor's degree. The higher percentage of female nurses might be related to gender distribution in Saudi Arabia, which is dominated by females as documented in other research **Alsulami et al., 2019.** Also consistent with **Cheragi et al., 2013** who reported that most nurses were females. While this was contradicted with regarding the age group it was less than 30 years.

The current study revealed that more than half of the participants' working experience reached 11 years or more. Also, more than two third of participant nurses had previous training in reporting medication errors. This was in line with **Mohammed, et al., 2022** who stated that the vast majority of the respondents had less than 10 years of work experience. While this disagreed with **Alshammari et al., 2021** who mentioned that more than half of the healthcare providers had not attended any training programs regarding medication error reporting systems within the past year.

Regarding factors of fear of the consequences of reporting medication errors the current study result revealed that approximately third of participants' nurses agree regarding fear of being blamed by nursing heads, and agree with the fear of blaming by doctors & colleagues if they reported the occurrence of medication errors in the clinical area. Moreover, third of the participants' nurses strongly disagree with fear of the impact of reporting errors on the personnel's annual evaluation. approximately of the participants strongly disagree mainly with the items of the fear of the impact of reporting errors on their salary and benefits, fear of causing side effects to the patient, and fear of being blamed by nursing heads.

This result is supported by many researchers **Sarvadikar et al., 2010, Ridelberg et al., 2014, and Alshammari et al., 2021** who stated that this creates a vicious cycle where patient safety events, errors, and imminent occurrences are not reported meaning that neither the department nor the individual can learn from errors and avoid similar negative events in the future.

Regarding the opinion of the studied sample according to the managerial factors, the current study result revealed that more than a quadrant of participant nurses agrees about the lack of receiving positive feedback from nursing heads following to report on medication errors, and the superiors' reactions to the seriousness of the mistake varied. While more than a quadrant of participants is neutral in their opinion about false beliefs in nursing heads and managers. Moreover, more than a quadrant of participants strongly disagrees regarding the heads' focus only on finding the culprits and blaming them, regardless of other factors involved in the occurrence of errors. These results were supported by **Alandajani et al., 2022, Lee 2017** who mentioned that less than half of such errors were reported only because of the managerial factors. Also this is consistent with **Mohammed et al., 2022** who mentioned a high prevalence of medication managerial errors might be explained by professional factors (such as poor competency, experience, lack of training on parenteral medication administration, lack of communication skills).

Regarding the distribution of studied sample according to medical factors affecting the incidence of nursing medication errors. The current study showed that approximately third of studied sample agreed that large variety of drugs in the medical cabinet and using acronyms of names, and they agree regarding the different medical dosages. Moreover, they agreed about medication package/similarity (LASA) are affecting the incidence of nursing medication errors. This was corresponding with **Mohammed et al., 2022** who mentioned that unavailability of medication administration guidelines and interruptions during medication administration increased the incidence of medications errors. therefore, developing appropriate medication guidelines, providing continuous on-the-job training, minimizing distractions during medication administration and retaining experienced nurses would be helpful for minimizing medication administration errors in the area.

Therefore, **Wensing et al., 2020** who recommended implementation of medication administration guidelines and providing care based on guidelines together with a consistent reporting system will improve the quality of nursing care and reduce medication administration errors. Furthermore, our results consistent with **Hartnell et al., 2012,** and **Ostini et al., 2012** who recommended that new and junior staff should be subject to orientation programs in order to familiarize them with the work routine and patient safety related policies. Because LASA medications are a contributing factor to medication errors, policymakers should consider developing and implementing a LASA policy to reduce healthcare professionals' confusion and related errors.

Concerning the distribution of human factors leading to medication errors the current study result showed approximately third of the studied sample agreed that lack of pharmacological knowledge, more than third of them agreed that poor relationship between nurses & physicians, and nurse patient’s ratio is the human factor leading to medication errors. Regarding inattention and negligence factors more than quarter of participants disagree and the same percentage had a neutral opinion. Also, approximately third of participant nurses agree about having physicians change orders the same percentage had a neutral opinion. Moreover, approximately third of them had a neutral opinion about physician factors and nurse-physician factors leading to medication errors.

This result was supported by **Mohammed et al., 2022** who revealed that inaccessibility of medication administration guidelines in the ward explained the higher odds of medication administration errors among nurses. However, more than half of them agreed that poor relationship between nurses and physicians and nurse patients' ratio. This finding is in line with findings of other studies **Tsegaye et al., 2020, Alharbi et al., 2018, and Abdel-Latif et al., 2016.**

The current study illustrated the existence of a statistically significant correlation between all factors that lead to medication error and sociodemographic characteristics mainly in the items of gender and level of education. While there was a significant correlation between fear of the consequences of reporting and all elements of socio-demographic characteristics. This finding contrasts with **Bahadori et al., 2013** who stated that there was no significant correlation between nurse demographic characteristics such as age and level of education with the studied areas of underreporting of medication errors including fear of reporting consequences, administrative factors, and factors related to the reporting process.

Conclusion

The study concluded that a third or more of the studied nurses have an disagreed about fear factor of the consequences of reporting medication errors or there is no fear of reporting whatever the consequences since the nursing staff had been practicing in reporting any medication errors incident in their respected clinical areas. A highly significant correlation was found between all factors leading to medication error and sociodemographic characteristics mainly in items of gender, and level of education level. While there was a significant correlation between fear of the consequence of reporting and all sociodemographic characteristics items

Recommendations

1. Continuous education related to drug study and correct dosage and calculation that have included fluid regulation to all nurses specifically nurses assigned in medication preparation and administration to prevent from medication errors and encouraging them to report any medication errors occurrence.
2. Fundamental improvement in medication safety is likely to require multiple, inter-relating, complex interventions.
3. Collaborative approach in medication error reporting systems.
4. Healthcare Professionals and patients should motivate in reporting the occurrence of errors to prevent from further harm.

Acknowledgment

We'd like to express our heartfelt gratitude to the panel of experts who contributed their valuable information, time, and expertise to this study. And we are grateful also for the support and help from all nurses who participated in this research study.

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