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Original Research Article

Factors Affecting Medication Administration Error by Nursing Staff at a Number of Medical Institutes in Riyadh, Cross Sectional Study

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Abstract

Medication errors genuinely influence patient safety, staying cost in hospital and integrity of nursing job, because the nurses play a specific part in managing the medication for the patients. Accordingly, the exploration of the reason, which can cause medication errors from their opinion can be a powerful tool to recognize errors and instruct the proper procedures for preventing them. This project aim to investigate factors associated with nurses' medication errors in a number of medical institutes (Ministry of Health) and the role of clinical pharmacist in these errors. The present project was cross-sectional study based on standardized questionnaire which was designed and distributed to the target nurses in a number of medical institutes (Ministry of Health). The target number was (171) depend on the calculation of sample size after the questionnaires were gathered; data were analyzed by the use of SPSS 24. The highest mean score was obtained in the factor related to medication packaging reason by 82.7%. The second group of reasons was system associated by 60.5%. The third reason was pharmacy associated by 45.3%. Documentation issues were the fourth reason by 39.5%. The physician-nurse issue was classified as the fifth and last group of why medication errors happen by 38.9%. The data of this project suggested the ranking of five reason of why medication errors happen: medication package reason, system reason, pharmacy reason, documentation-transcription reason and physician-nurse reason. All the medical field staff play a critical role in preventing these errors .Furthermore, clinical pharmacists must improve the nurses' knowledge of how these factors will lead to critical errors and help them discover strategies to prevent these errors from happening.

Keywords: Medication, patient safety, nursing

INTRODUCTION

These days, more than twenty thousand medications are expended worldwide; the wrong utilization can cause extreme dangers and risks to the patients. The right technique for medication administration, which is the major duty of nurses, appears to be crucial for safety of the patients. Nurses have an exceptionally critical obligation in keeping medicine errors from occurring since they assume the primary part in medication administration (Pournamdar and Zare, 2016).

Patient safety, as one of the key segments of healthcare quality, is defined as "the prevention of harm to patients during medical care" Drug mistakes are

among the most dangerous errors which affect patient safety and are known as one of the most common medical errors (Ebrahimipour et al., 2016).

Drug administration is considered as fundamental capacity for nurses, and that nurses competency and following rules of medication administration is a guarantee for patients' safety and quality of nursing care. (Aboshaiqah, 2014), (Fawzia and Eman, 2015).

Each hospitalized patient can get up to 18 doses of medicine every day, and a nurse can give around 50 drugs for every shift. This puts the nurse at the first line of drug administration responsibility a report by the National Patient safety agency (NPSA) demonstrated that 56.5% of reported errors related with serious damage or death happened at the administration step (Dumo, 2012).

Aboshaiqah in 2014 at two local hospital she did study which was directed among 309 nurses, he found the rate of medication error among nurses was 1.4 times per month (SD = 1.3). The most well-known factors related with errors were "Unit staffs do not receive enough in services on new medications" (69.6%, n = 215) (Aboshaiqah, 2014).

Additionally, Sulaiman al-yousifi in 2013 his study was done out in all sections of King Khalid Public Governorate Hospital in Hafer El-Batin at Kingdom Saudi Arabia. A comfort sample of 253 nursing staff was utilized and discovered medication administration errors occur. He found that the medication package reason (63.5) was seen as the most important factor for reasons of medication administration errors happen (Youssif, 2013).

On the other hand, Cloete in 2015 discovered higher medication error rates are related with greater levels of interruptions during medication administration (Cloete, 2015).

Additionally, Dumo in 2012 did the study, which is quantitative-descriptive type using researcher-made questionnaire. Add up to count was utilized including 210 nurses participated in the study. It discover those experts factors is the main source of medication errors, In conclusion, the longer the hospital experience and the proficient a nurse is in the standards of care on medication management, the higher is the capacity of the nurse to deal with factors influencing medication errors (Dumo, 2012).

The role of clinical pharmacists of taking care of hospitalized patients has evolved over time, with expanded emphasis on collaborative care and patient interaction. Clinical pharmacists have the relevant background in therapeutics and give complete medication management to patients and provider including the nurses (include doctors and extra individual from the care team) (Majid, 2012).

Studies demonstrate that the incorporation of the clinical pharmacists in the intensive care unit decrease mortality and adverse events enhances clinical outcomes and decrease hospital cost (Alves et al., 2014).

Hassani and his group in 2017 did A prospective, interventional study and during the 8 months of the study time frame, 498 errors were recognized by clinical pharmacists among 419 patients that admitted to infectious disease ward (Hassani et al., 2017).

Mshiemish in 2017 intended study to compare between two groups of patients, he found the presence of clinical pharmacist during visit as a full member of the patient care team in internal medicine ward was related with a significantly brought down rate of ADEs which caused by prescribing errors (Mshiemish, 2017).

This project aim to investigate factors associated with nurses' medication errors in a number of medical institutes (Ministry of Health) and the role of clinical pharmacist in these errors.

METHODOLOGY

Study Design, Site of the Study and instruments used

Cross sectional study was carried out between July - December 2017, at a number of medical institutes in Riyadh KSA (Alyamama and Huraymela hospitals). The tool of study was a well-structured questionnaires consisting of 14 questions that were distributed to the health care professional Nurses. The questionnaire was adapted and modified from (Youssif, 2013), (Aboshaiqah, 2014). Additionally their questions were previously developed by (Wakefield et al., 1998). The targeted health care professionals were nurses.

Inclusion criteria

1. Health care professionals target were (Nurses) Saudi and non-Saudi.
2. They had to be working in the Ministry of Health during study time either male or female.
3. They had to be dealing with the patient directly in the wards of the hospital.

Exclusion criteria

1. Any medical experts other than Nurses.
2. Any Nurses not working in ministry of health.
3. Any nurses who had not to be dealing with the patient directly in the wards of the hospital.

Data Collection and sample size

According to calculation of sample size by (www.raosoft.com) and the confidence level was 90% our target nurses were N=171 nurses from a total 457

Table 1. Distribution of participants by nationality and educational level

		Frequency (n)	Percent (%)
Nationality	*Saudi*	78	45.6
	Non-Saudi	93	54.4
Educational level	*Diploma*	89	52.0
	Bachelor degree	82	48.0

Table 2. Factors associated with medication errors (n=171)

Items	Yes n (%)	No n (%)
Different medications look alike	147 (86.0)	24 (14.0)
Nurses are pulled between teams and from other units	136 (79.5)	35 (20.5)
The names of many medications are similar	129 (79.4)	42 (24.6)
Physicians' medication orders are not legible\clear	95 (55.6)	76 (44.4)
Nurses are interrupted while administering medications to perform other duties	95 (55.6)	76 (44.4)
Pharmacists not give education workshop	92 (53.8)	79 (46.2)
Abbreviations are used instead of writing the orders out completely	71 (41.5)	100 (58.5)
Nurses on this unit have limited knowledge about medications	68 (39.8)	103 (60.2)
Pharmacy does not prepare\ label the medication correctly	63 (36.8)	108 (63.2)
Poor communication between nurses and physicians	61 (35.7)	110 (64.3)
Nurse is unaware of a known allergy	60 (35.1)	111 (64.9)
Physicians change orders frequently	58 (33.9)	113 (66.1)
Equipment malfunctions or is not set correctly	57 (33.3)	114 (66.7)
Nurses on this unit do not adhere to the approved medication administration procedure	40 (23.4)	131 (76.6)

nurses. Questionnaires were distributed to participants, and all the 171 respondents were enrolled in the study.

RESULTS

One hundred seventy one nurses responded to the survey. Of the 171 nurses, 45.6% (n=78) were Saudis and 54.4% (n=93) were non-Saudis. About 52% (n=89) of nurses had diploma and 48% (n=82) had bachelor degree or higher (Table 1). The mean (±SD) total years of experience was 7.2±4.1 years . The mean (±SD) years of experience inside KSA was 6.3±4.1 years and outside KSA was 3.2±1.8 years. The mean (±SD) years of experience of non-Saudi nurses was 7.8 (±4.1) years and Saudi nurses was 6.5 (±3.9) years ($p<0.05$). Furthermore, mean (±SD) years of experience of diploma holders was 8.2 (±4.2) years and bachelor degree holders was 6.2 (±3.7) years ($p<0.05$) (Table 1).

Factors associated with medication errors

Regarding factors associated with medication errors, the analysis showed that the most reported factors associated with medication error is:" Different medications look alike" (86%, n=147), followed by "Nurses are pulled between teams and from other units" (79.5%, n=136) and "The names of many medications are similar" (79.4%, n=129), while the lowest reported factors are "Nurses on this unit do not adhere to the approved medication administration procedure" (23.4%, n=40), followed by "Equipment malfunctions or is not set correctly" (33.3, n=57), and "Physicians change orders frequently" (33.9, n=58) as seen in (Table 2)

Factors associated with medication errors by nationality

Two-way cross-tabulation showed that Saudi nurses are more likely to agree that the most association factors are "Nurses on this unit have limited knowledge about medications" and "Nurses are interrupted while administering medications to perform other duties". (Table 3). The most reported factors associated with medication error reported by Saudis and non-Saudis are "Different medications look alike" (85.9% and 86% respectively), followed by "Nurses are pulled between teams and from other units" (78.2% and 80.6% respectively) and "The names of many medications are similar" (73.1% and 77.4% respectively). The lowest reported factors by Saudis are "Physicians change orders frequently" (25.6%, n=20), followed by "Equipment

Table 3. Factors associated with medication errors by nationality (n=171)

Items	Nationality			
	Saudi		Non-Saudi	
	Yes n (%)	No n (%)	Yes n (%)	No n (%)
The names of many medications are similar	57 (73.1)	21 (26.9)	72 (77.4)	21 (22.6)
Different medications look alike	67 (85.9)	11 (14.1)	80 (86.0)	13 (14.0)
Physicians' medication orders are not legible\clear	37 (47.4)	41 (52.6)	58 (62.4)	35 (37.6)
Physicians change orders frequently	20 (25.6)	58 (74.4)	38 (40.9)	55 (59.1)
Abbreviations are used instead of writing the orders out completely	29 (37.2)	49 (62.8)	42 (45.2)	51 (54.8)
Pharmacy does not prepare\ label the medication correctly	26 (33.3)	52 (66.7)	37 (39.8)	56 (60.2)
Nurses on this unit have limited knowledge about medications	43 (55.1)	35 (44.9)	25 (26.9)	68 (73.1)
Nurses are pulled between teams and from other units	61 (78.2)	17 (21.8)	75 (80.6)	18 (19.4)
Nurses are interrupted while administering medications to perform other duties	51 (65.4)	27 (34.6)	44 (47.3)	49 (52.7)
Equipment malfunctions or is not set correctly	22 (28.2)	56 (71.8)	35 (37.6)	58 (62.4)
Nurse is unaware of a known allergy	33 (42.3)	45 (57.7)	27 (29.0)	66 (71.0)
Pharmacists not give education workshop	41 (52.6)	37 (47.4)	51 (54.8)	42 (45.2)
Poor communication between nurses and physicians	29 (37.2)	49 (62.8)	32 (34.4)	61 (65.6)
Nurses on this unit do not adhere to the approved medication administration procedure	22 (28.2)	56 (71.8)	18 (19.4)	75 (80.6)

Table 4. Factors associated with medication errors by educational level (n=171)

Items	Educational level			
	Diploma		Bachelor degree	
	Yes n (%)	No n (%)	Yes n (%)	No n (%)
The names of many medications are similar	67 (75.3)	22 (24.7)	62 (75.6)	20 (24.4)
Different medications look alike	81 (91.0)	8 (9.0)	66 (80.5)	16 (19.5)
Physicians' medication orders are not legible\clear	45 (50.6)	44 (49.4)	50 (61.0)	32 (39.0)
Physicians change orders frequently	26 (29.2)	63 (70.8)	32 (39.0)	50 (61.0)
Abbreviations are used instead of writing the orders out completely	34 (38.2)	55 (61.8)	37 (45.1)	45 (54.9)
Pharmacy does not prepare\ label the medication correctly	29 (32.6)	60 (67.4)	34 (41.5)	48 (58.5)
Nurses on this unit have limited knowledge about medications	38 (42.7)	51 (57.3)	30 (36.6)	52 (63.4)
Nurses are pulled between teams and from other units	70 (78.7)	19 (21.3)	66 (80.5)	16 (19.5)
Nurses are interrupted while administering medications to perform other duties	45 (50.6)	44 (49.4)	50 (61.0)	32 (39.0)

Table 4. Continue

Equipment malfunctions or is not set correctly	26 (29.2)	63 (70.8)	31 (37.8)	51 (62.2)
Nurse is unaware of a known allergy	32 (36.0)	57 (64.0)	28 (34.1)	54 (65.9)
Pharmacists not give education workshop	42 (47.2)	47 (52.8)	50 (61.0)	32 (39.0)
Poor communication between nurses and physicians	29 (32.6)	60 (67.4)	32 (39.0)	50 (61.0)
Nurses on this unit do not adhere to the approved medication administration procedure	18 (20.2)	71 (79.8)	22 (26.8)	60 (73.2)

malfunctions or is not set correctly" (28.2%, n=22) and "Nurses on this unit do not adhere to the approved medication administration procedure" (28.2%, n=22). On the other hand, the lowest reported factor by non-Saudis are "Nurses on this unit do not adhere to the approved medication administration procedure" (19.4%, n=18), followed by "Nurses on this unit have limited knowledge about medications" (26.9%, n=25) and "Nurse is unaware of a known allergy" (29%, n=27).

Factors associated with medication errors by educational level

Two-way cross-tabulation showed that bachelor degree holders are more likely to agree on the majority of the contributing factors (Table 4). The most reported factors associated with medication error reported by diploma and bachelor degree holders are "Different medications look alike" (91% and 80.5% respectively), followed by "Nurses are pulled between teams and from other units" (78.7%, and 80.5% respectively) and "The names of many medications are similar" (75.3% and 75.6% respectively). The lowest reported factors by diploma holders are "Nurses on this unit do not adhere to the approved medication administration procedure" (20.2), followed by "Equipment malfunctions or is not set correctly" (29.2) and "Physicians change orders frequently" (29.2). On the other hand, the lowest reported factor by bachelor holder are "Nurses on this unit do not adhere to the approved medication administration procedure" (26.8%), followed by "Nurse is unaware of a known allergy" (34.1%) and "Nurses on this unit have limited knowledge about medications" (36.6%).

DISCUSSION

Nurses play an important role in daily drugs administer and in reducing medication errors in patients' healthcare systems. Since the administration of medication is last step of medication process so, the nurses are responsible because they are on the last line defense against medication errors thus; the aim of this study was to explore the factors that contribute to medication errors by nurses staff. In this project, the outcomes of factors analyzed to five reason groups of why medication errors happen that were recognized in the survey. These groups are classified to medication packaging reasons, system reasons, pharmacy reasons, documentation-transcription reasons and physician-nurse reasons.

In the present project, the first group of reasons why medication errors may happen is associated medication package reason, which further includes: different medication look alike and the names of many medication are similar. However, it is difficult to recognize medication when it has been removed from its original packaging and it is very simple to confuse it with other medication, thus, good label design will ensure safety due to avoiding the confusion with other medications. Our study aligns with a previous one done by (Youssifi, 2013) who also, came to the same conclusion.

The second group of reasons why medication errors happen is associated with the system and includes: abbreviations are used instead of writing the orders out completely and nurses are pulled between team and from other duties. This result is similar to what was reported by(Youssif,2013) in contrast (Aboshaiqah, 2014) reported that the second factor is the physician\nurse communication.

Present project showed that the pharmacy role is the third affecting group which includes: pharmacy dose not prepare\label the medication correctly and pharmacist do not give education workshop and the ideally the pharmacists should collaborate with the prescriber in developing and monitoring the therapeutic plan to produce defined therapeutic outcomes for the patients (Ojerinde and Adejumo, 2014)reported in their study similar result and outcomes to ours , in exception, they reported it as the major contributer, not the third as in this project.

The present project illustrates the participants' perceived Documentation issue is the fourth affecting reason of medication errors and these include: nurses are interrupted while administering medication to perform other duties and nurses on this unit do not adhere to the

approved medication administration procedure. These finding may be due to nurses missed what is written on documents and the nurses sometimes have difficult time to know some words

especially if the team from different region and work experience also have an impact(Cloete2015),reported a similar line of results as in this project, in exception, he reported it as the major contributer, not the fourth as in this project.

Outcomes of this project indicate that the physician-nurse issue classified as the fifth and last group of why medication errors happen which includes: physician medication order not legible\clear, physician change order frequently, nurses on this unit have limited knowledge about medication, equipment malfunction or it is not set correctly. Nurses is unaware of a known allergy and poor communication between nurses and physician. This finding is consistent with (Dumo2012) who reported that poor nurse\physician relationship may lead to medication errors, because the physician do not respect or care to listen to nursing perspective on patient care that lead to misunderstanding and conflict between physician and nurses.

According to our result about factors associated with medication error, there was a factor (Pharmacist not give education workshop) it comes with around (54% n=92) which give us that the clinical pharmacist play a role by educating the staff nurse about the medication to avoid errors. Furthermore, they play an important role in reducing medication errors and adverse drug reaction. The rounding with the team give a good outcome against medication errors by intervention and detecting the errors and by giving a full information about the medication to the healthcare professionals and counselling the medication to the patient. (Majid 2012).

CONCLUSION

In conclusion, the data of this study suggested the ranking of five reason of why medication errors happen: medication package reason, system reason, pharmacy reason, documentation-transcription reason and physician-nurse reason. Medication errors may happen in all medical field and to reduce these errors the prescriber who decide the prescription and the pharmacist who dispensed the medication and the nurse who is at the last step of this process to give the medication to the patient must cooperate together to avoid these errors thus, all the medical field staff play a critical role in preventing these errors. Additionally it is must to improve the nurses' knowledge of how these factors will lead to critical errors and help them to discover strategies to prevent these errors from happen by a clinical pharmacist because the clinical pharmacist play an important role in reducing and intervention against the errors.

REFERENCE

Aboshaiqah AE (2014). Nurses¡¯ Perception ofMedication Administration Errors. Ame. J. Nur. Res. 2, 63-67.

Alves GMR, Varallo FR, Lucchetta RC, Mastroianni PDC (2014). Role of the clinical pharmacist in detection of drug therapy problemas in critically impatients: experience report. J. Phamacovigilance, 1-6.

Cloete L (2015). Reducingmedication errors in nursing practice. Nursing Standard, 29, 50-59.

Dumo A. M. B. (2012). Factors affecting medication errors among staff nurses: basis in the formulation of medication information guide. IAMURE Int. J. Health Edu. 1, 88-149.

Ebrahimipour H, Hooshmand E, Bayrami R, Pourshirazi M, Afiat M, Esmaili H, Vafaee Najar A (2016). Medication Errors and its Contributing Factors among Midwives. J. Midwifery and Reproductive Health, 4, 748-756.

Fawzia E. S. A, Eman AE (2015). Medication administration errors at Children's University hospitals: nurses point of view. J Nur Health Sci, 4, 51-60.

Hassani S, Eshraghi A, Hematian F, Taheri M, Sahraei Z (2017). Role of Clinical Pharmacists in Early Detection, Reporting and Prevention of Medication Errors in a Medical Ward. J. Pharma. Care, 3, 54-60.

Majid AK (2012). The roles of clinical pharmacy in reducing medication errors. Int Res J Pharm, 3.

Mshiemish BA (2017). Role of the Clinical Pharmacist in Reducing Preventable Adverse Drug Events. Iraqi Journal of Pharmaceutical Sciences (ISSN: 1683–3597, ESSN: 2521–3512), 20, 85-90.

Ojerinde AC, Adejumo P (2014). Factors associated with medication errors among health workers in University College Hospital, Nigeria. Journal of Nursing and Health Science, 3, 22-23.

Pournamdar Z, Zare S (2016). Survey of Medication Error Factors from Nurses' Perspective. Biology and Medicine, 8, 1.

Wakefield BJ, Wakefield DS, Uden-Holman T, Blegen MA (1998). Nurses' perceptions of why medication administration errors occur. MedSurg Nursing, 7, 39.

Youssif S (2013). Nurses' Experiences toward Perception of Medication Administration Errors Reporting. IOSR-JNHS IOSR J. Nursing and Health Science, 1, 56-70.