Nurses' Perception Regarding Medication Administration Errors

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Abstract

Background: The main professional goal of nurses is to provide and improve human health. Medication administration to patients is part of clinical nursing practice with high risk of errors occurrence. **Aim**: This study aimed to assess the nurses' perception regarding medication administration errors. **Study design**: A descriptive exploratory study was from January 2021, to April 2021. **Subject**: A convenient sample consisted of 50 nurses assigned for administering patient's medication. **Setting**: The study conducted at medical ward, ICU, and CCU in the 6 of October Hospital. **Data collection tools**: Structured Self-administered Questionnaire for nurses included two parts; to get data in relation to the demographic characteristics, and nurses' knowledge regarding medication administration errors. **Results**: Based on findings of the current study, regarding the total satisfactory level of knowledge regarding concept of medication administration errors, there was 40 % of nurses had satisfactory level of knowledge with (X^2 4.0 and P-Value 0.046*).While there was statistically significant relation between nurses` level of knowledge regarding concept of medication administration errors with and years of experience when P-value <0.05*. **Conclusion**: Based on findings of the current study, can be concluded that, there was less than half of nurses had satisfactory level of knowledge regarding concept of medication administration errors, and there was statistically significant relation between nurses' level of knowledge about the interventions for occurrence of errors during drug administration, with age, qualifications and years of experience. **Recommendations**: In service education should be provided in hospital to improve nurses' performance regarding medication administration measures through implementing the training program regarding drug administration which must be up dated periodically. Proper planning and a comprehensive system to monitor the process of error reporting can reduce the number of errors and prevent complication.

Introduction

Medications are chemical compounds administered for the purpose of prevention, diagnosis, and treatment of patients. All medicines have toxic effects; therefore all medications are expected to be given carefully to achieve the desired result and outcome, and to avoid the adverse drug reactions. Nurses give almost all types of medications in the hospitals. There are factors that may have effect on nurses` medication administration practice may affect patients` outcome. Medication administration practice errors have an impact on mortality and morbidity **(Kimeu, 2015).** The medicine administration process is considering as multistage practice and complex process in hospital setting. Medication administration process exposes risk to medication errors that are surprisingly common and costly; medicine administration requires theoretical and clinical medication competence. In depth knowledge of medicine includes pharmacodynamics, therapeutic uses, adverse effect, and appropriateness of administrating the medication is considering the patient`s current response to treatment **(Pirinen, Salantera, Kauhanenl, and Lilius, 2015).**

The main professional goal of nurses is to improve human health. Medication administration to patients is part of clinical

nursing practice with high risk of errors occurrence. But often unrecognized and unreported errors from the staff will not discover and announce that the error has been occurred **(Cheragi, Manoocheri, Mohammadenejad, and Ehsani, 2013).**

Medications may be given to the whole, unit by the same nurses or to a smaller group of patients by the other healthcare team members as physicians. The main effort is done by the nurse because nurse is responsible for the interpretation the description and prescription accurately, recording that the medication has been administered and also, observe the patient's response after taking the medications. Prior to drug administration, the nurse must know the reason for, action and usual dosage, route of giving the drug; this must enable her or him to know mistakes in medication prescription **(Alireza, Fatemeh, and Nasrin, 2020)**. In the society and community, most patients, or some member of the family, are responsible for medication administration, although the nurse may have that role to do effectively. All errors are considered as a global problem which raises the mortality rates, length of stay at hospital, and the related costs. So, avoiding these errors is important for the nurse and patients to avoid the punishment and also keeping the patient safe **(Sutherland, et al., 2020).**

At the hospital or at any health care setting, the distractors during the administration process of medication are common and related to the raising of severity error and risks. The main key strategies to provide safe administration is the reducing of that interruptions during giving medications and also building in safety checks via standardized workflows **(Paul, Ann, and Michaela, 2021)**.

Medication safety improvement needs changes at many levels of a hospital system, with clinical governance for prescribing, preparation, dispensing, monitoring and administering. And in the level of performance of health team members especially at the level of nursing practices. On other hand, the vital

effect of the effective continuous professional development training courses for nurses regarding patients` safety measures such as medication administration, and well-evidenced framework requires a good plan for behavior change for designing interventions **(WHO, 2017).**

Add to that, staff` motivation as nurses improve their acts. And also, the training courses will improve their skills, practices and knowledge regarding drug administration that will reduce the errors and decrease the costs and change these errors to benefits for the hospital and patients **(Eleanor, et al., 2017)**

Significance of the study

Medication administration is one of the main nursing roles in hospital wards and drug errors are considered one of the worst errors among nurses causing an unpleasant result for patients and nurses. In the United States of America after car crash, diabetes, breast cancer, renal diseases, and influenza, the medication administration errors are considered the highest sixth cause of death **(Dirik, Hewison, and Seren, 2019)**.

The occurrence of adverse health events is an indicator of compromised patient safety. Worldwide, the reported incidence of adverse health events was between 4% and 17%. Interestingly, it was found that around 50% of all reported adverse events which compromised safety of patients are preventable. Medication errors happen in every country and studies have examined the nurses' medication errors. The significant impact of medication administration errors affect patients in terms of morbidity, mortality, adverse medication events, and increased length of hospital stay. It also increases costs. Due to this, assessing the magnitude & associated factors of medication administration errors has a significant contribution for improving the quality of patient care **(Killam et al., 2017).**

Aim of the Study

This study aimed to assess the nurses' perception regarding medication administration errors.

Subjects and Methods:

A descriptive exploratory study was done with a convenient sample consist of 50 nurses assigned for administering patient's medication, data collection tool was structured self-administered questionnaire which had been prepared & adjusted based on literature review. The questionnaire included three parts; to get data in relation to the demographic characteristics, nurses' knowledge regarding medication administration errors, and interventions if medication errors occur. All was to examine pharmacology knowledge and the risk of medical errors. Observing and recording errors that occurred during the preparation, it was conducted on 50 nurses from January 2021 to April 2021. Participants were from intensive care, coronary care units & medical wards. Each participant was given a test on pharmacology knowledge, and drug calculations. The inclusion criteria were appropriate physical, mental health status & willingness to participate & reassuring the confidentiality of the collected information. Data were analyzed using descriptive and inferential statistics in SPSS for Windows 16.0 and P-values less than 0.05 were considered significant.

1-Technical Design:

The technical design included research design, setting, subjects and tools of data collection.

A - Research design:
This study was conducted through using a descriptive design.
B- Setting:
The study was conducted at the intensive care unit, coronary care unit & medical ward affiliated to the 6 October Hospital.

C-Subject:

A convenient sample consists of 50 nurses providing direct patient's medication administrations were selected from nurses.

D. Tools of data collection.

The tools used in this study were:

A Structured Self-administered Questionnaire which had been prepared & adjusted based on literature review. A questionnaire including two parts:

Part 1. Demographic assessment. It was used to assess demographic data of nurses as; age, marital status, years of experience qualifications etc.

Part 2. Assessment nurses' level of knowledge regarding common errors during drug administration which included;

A- Nurses' level of knowledge regarding concept of medication administration errors. It was used to assess nurses` level of knowledge regarding common errors as; defining drug, sources, five rights of drug administration, etc. It was composed of (20 questions), with the response of yes or no.

Scoring system

The score for correct answer for each question was one and incorrect answer was zero. The total score for nurses` level of knowledge regarding common errors were 20 grades.

The total score was considered as the following:

* ≥ 60% was considered a satisfactory.

* < 60% was considered unsatisfactory.

B- Nurses' level of knowledge about the factors affecting nurses regarding common errors during drug administration. It was used to identify nurses' level of knowledge about the factors affecting nurses regarding common errors during drug administration as; attending to training courses of drug administration, shortage of nurses, rotation of nurses in units, etc. It was concerned with the assessment of factors affecting nurses regarding common errors during drug administration. It was composed of (13 questions), with the response of yes or no.

Scoring system

The score for correct answer for each question was one and incorrect answer was zero

C- Nurses' level of knowledge about the interventions for occurrence of errors during drug administration. It was used to examine nurses` interventions during drug administration errors as; directly stop of drug administration during, reporting physician, writing incident report etc.

The score for correct answer for each question was one and incorrect answer was zero. The total score for interventions during drug administration errors were 5.

2-Administrative Design:

A letter was issued from the researchers to the Director of the 6 October Hospital.to conduct the study, explaining the purpose of the study and requesting the permission for data collection from the studied patients.

Ethical Considerations:

The ethical research considerations in this study included the following:

* The research approval of the study was obtained from the director of the 6 October Hospital.to conduct the study

* The researcher clarified the objective and aim of the study to the nurses included in the study.

* The researcher assured maintaining anonymity and confidentiality of the subject's data.

3-Operational Design:

The operational design included preparatory phase.

* Preparatory phase:

It included the reviewing of current and past, national and international related literature and theoretical knowledge of various aspects of the study using books, articles, periodicals, magazines and internet to develop tools for data collection.

4-Statistical Design:

The collected data were organized, analyzed using appropriate statistical significance tests. The data were collected, coded and entered into a personal computer (PC). Statistical presentation and analysis of the present study was conducted, using the mean, standard Deviation, **chi-square test** was used to compare between groups in qualitative, **linear correlation coefficient (r)** was used for detection of correlation between two quantitative variables in one group. By (IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.).

Results:

Table (1): Regarding demographic characteristics of study nurses, the mean ± SD age of the studied nurses was (33.75±4.62), (60%) of nurses in and below the age of 41, (80 %) were married, (52%) of nurses were females. While, regarding the qualifications (68%) of the studied nurses were with diploma and only (4%) was with high qualifications, about the unit of working, there was (64%)

nurses working in ward, (40%) of nurses working for 12 hours daily. As regard the years of experience, there were (74%) of nurses had more than 8 years of experience and also, (74%) were bedside nurses.

Table (2): Concerning the nurses' level of knowledge regarding concept of medication administration errors. Regarding the nurses knowledge about the definition of drug errors only 14% knew it, and about directly signing after drug preparation and after drug administration it was (34% and 28%) respectively. regarding, doing laboratory investigations before drug administration only 16% who do it. While 40 % of nurses do reviewing at the unit the effects of drug after administration. Regarding the total satisfactory level of knowledge regarding concept of medication administration errors, there was 40 % of nurses had satisfactory level of knowledge with (X² 4.0 and P-Value 0.046*).

Table (3): Reveals that, nurses' level of knowledge about the factors affecting nurses regarding common errors during drug administration. Regarding to the attending number of nurses to special drug administration training courses, there was 100% of the studied nurses did not attend it, and about shortage of nurses that causes errors, there was 64% as causes. As regards the errors occurs due to nurses rotation, there was 80% of rotation causes errors. About the morning shift errors and night shift errors that occur it was (74% and 26%) respectively.

Table (4): In relation to nurses' level of knowledge about the interventions for occurrence of errors during drug administration, there were only 26 % of nurses who talks to avoid blaming and punishment, while 100% of nurses did not write incident report. Regard to reporting the supervisor and physician at shift, only 20% who does it.

Table (5): Regarding to relation between the demographic characteristics of nurses and nurses' level of knowledge regarding concept of medication administration errors, there was a highly statistically significant relation between nurses` level of knowledge concept of medication administration errors with age and qualifications when P- Value.<0.001*). While there was statistically significant relation between nurses` level of knowledge regarding concept of medication administration errors with and years of experience when P-value <0.05*.

Table (6): Concerning to relation between the demographic characteristics of nurses and nurses' level of knowledge about the factors affecting nurses regarding common errors during drug administration, there was no statistically significant relation between demographic characteristics of nurses and nurses' level of knowledge about the factors when p-value >0.05.

Table (7): Regards to the relation between demographic characteristics of nurses and nurses' level of knowledge about the interventions for occurrence of errors during drug administration, there was statistically significant relation between nurses' level of knowledge about the interventions for occurrence of errors during drug administration, with age, qualifications and years of experience when p-value <0.05*.

Part I. Demographic assessment. (Table 1).

Table (1): Number and percentage distribution of demographic characteristics of the study Nurses (N=50).

Items	N	%	
Age			
20-30	10	%20	
31-40	20	40%	
>41	20	40%	
Mean ± SD		33.75±4.62	
Marital status			
Single- Widow- Divorced	10	20%	
Married	40	80%	
Sex			
Male	24	48%	
Female	26	52%	
Unit of work			
Emergency	2	4%	
ICU	16	%	32
Ward	32	%	64
Qualifications			
Diploma	34	%	68
Institute	14	%	28
Higher education	2	%	4
Working hours			
8	12	24%	
12	20	40%	
24	18	36%	
Mean ± SD		14.26±5.1	
Years of experience			
> 2	1	%	2
3-8	12	%	24
>8	37	74%	
Mean ± SD		5.7±2.4	
Job specification			
Supervisor	13	26%	
Bedside nurse	37	74%	

Part II: Assessment nurses' level of knowledge regarding common errors during drug administration (Tables, 2,3,4).

Table (2): **Nurses' level of knowledge regarding concept of medication administration errors (N=50 Nurses).**

Item	(N=50)				χ2	P- Value
	Satisfactory		**Unsatisfactory**			
	N	**%**	**N**	**%**		
Drug sources	21	42%	29	58%	2.560	0.110
Definition of drug errors	7	14%	43	86%	51.840	<0.001*
Drug store one of errors	22	44%	28	56%	1.440	0.230
Giving overdose consider error	40	80%	10	20%	36.000	<0.001*
Delaying drug time during patient investigation	50	100%	0	0%	100.000	<0.001*
Administration drug without drug right name	32	64%	18	36%	7.840	0.005*
Knowing five drug rights	12	24%	38	76%	27.040	<0.001*
Directly Signing after drug preparation	17	34%	33	66%	10.240	<0.001*
Directly Signing after drug administration	14	28%	36	72%	19.360	<0.001*
Identifying previous drug taking	23	46%	27	54%	0.640	0.424
Difference between drug action and effect	6	12%	44	88%	57.760	<0.001*
Drug is only therapeutic	40	80	10	20	36.000	<0.001*
Relation between drug and excretory organs body system	7	14%	43	86%	51.840	<0.001*
Measuring vital signs before drug administration	27	54	23	46	0.640	0.424
Checking lab. Investigations before drug administration	8	16%	42	84%	46.240	<0.001*
Assessment of patient during drug administration	31	62	19	38	5.760	0.016*
Instructions of Sub cutaneous drug administration	0	0%	50	100%	100.000	<0.001*
Reviewing in unit the drug effects after administering	20	40%	30	60%	4.000	0.046*
Nurse action for patient refusing drug	32	64%	18	36%	7.840	0.005*
Patient education about drug before discharge	0	0%	50	100%	100.000	<0.001*
Total knowledge	20	40%	30	60%	4.000	0.046*

Table (3): Nurses' level of knowledge about the factors affecting nurses regarding common errors during drug administration.

Item	Yes N	Yes %	No N	No %	χ2	P- Value
	(N=50)					
Training courses of special drug administration	0	0%	50	100%	100.000	<0.001*
Sufficient number of nurses to patients ratio 1to more than 3 patients	11	22%	39	78%	31.360	<0.001*
Room of drug preparation	50	100%	0	0%	100.000	<0.001*
Revision of drug prescription by nurses	0	0%	50	100%	100.000	<0.001*
Shortage of nurses causes errors	32	64%	18	36%	7.840	0.005*
Past general training for nurses staff at unit	34	78%	16	32%	12.960	<0.001*
Continuous supervision during drug preparation	0	0%	50	100%	100.000	<0.001*
Drug store changes periodically	0	0%	50	100%	100.000	<0.001*
Nurses rotation causes errors	40	80%	10	20%	36.000	<0.001*
Morning shift errors	37	74%	13	26%	23.040	<0.001*
Night shift errors	13	26%	37	74%	23.040	<0.001*
Oral phone drug prescription	4	8%	46	92%	70.560	<0.001*
Night shift nurse Revision of prescription	30	60%	20	40%	4.000	0.046*
Total Factors	19	38%	31	62%	5.760	0.016*

Table (4): Nurses' level of knowledge about the interventions for occurrence of errors during drug administration.

Item	Yes N	Yes %	No N	No %	χ2	P-Value
	(N=50)					
Directly stop of drug administration during occurring errors of drug administration	39	78%	11	22%	31.360	<0.001*
Talk to avoid blaming and punishment	13	26%	37	74%	4.000	0.046*
Write incident report	0	0%	50	100%	100.000	<0.001*
Only observe patient and vital signs	29	58%	21	42%	23.040	<0.001*
Report supervisor and physician at shift	10	20%	40	80%	36.000	<0.001*
Total	18	36	32	64	7.840	0.005*

Table (5): Relation between the demographic characteristics of nurses and nurses' level of knowledge regarding concept of medication administration errors

	Level of knowledge regarding concept of medication administration errors						
	Satisfactory		Unsatisfactory		Total	Chi-square	
	N	%	N	%		X^2	P-value
Age							
20-30	1	2	9	18	10		
31-40	5	10	15	30	20	13.125	<0.001*
>41	14	28	6	12	20		
Qualifications							
Diploma	7	14	27	54	34		
Institute	11	22	3	6	14	17.017	<0.001*
Higher education	2	4	0	0	2		
Years of experience							
0-2	0	0	1	2	1		
3-8	1	2	11	22	12	7.667	0.022*
>8	19	38	18	36	37		

P. >0.05 Non significant   P. <0.05* significant   P. <0.001* High significant

Table (6): Relation between the demographic characteristics of nurses and nurses' level of knowledge about the factors affecting nurses regarding common errors during drug administration.

	Level of knowledge about the factors						
	Satisfactory		Unsatisfactory		Total	Chi-square	
	N	%	N	%		X^2	P-value
Age							
20-30	2	4	8	16	10		
31-40	6	12	14	28	20	4.372	0.112
>41	11	22	9	18	20		
Unit of work							
Emergency	1	2	1	2	2		
ICU	5	10	11	22	16	0.525	0.769
Ward	13	26	19	38	32		
Qualifications							
Diploma	10	20	24	48	34		
Institute	7	14	7	14	14	5.183	0.075
Higher education	2	4	0	0	2		
Working hours							
8	4	8	8	16	12		
12	7	14	13	26	20	0.505	0.777
24	8	16	10	20	18		
Years of experience							
0-2	0	0	1	2	1		
3-8	3	6	9	18	12	1.905	0.386
>8	16	32	21	42	37		
Job specification							
Supervisor	6	12	7	14	13	0.496	0.481
Bedside nurse	13	26	24	48	37		

P. >0.05 Non significant   P. <0.05* significant   P. <0.001* High significant

Table(7): Relation between demographic characteristics of nurses and nurses' level of knowledge about the interventions for occurrence of errors during drug administration.

| | Level of knowledge about the interventions | | | | | Chi-square | |
| | Satisfactory | | Unsatisfactory | | Total | | |
	N	%	N	%		X^2	P-value
Age							
20-30	0	0	10	20	10		
31-40	7	14	13	26	20	8.767	0.012*
>41	11	22	9	18	20		
Years of experience							
0-2	0	0	1	2	1		
3-8	0	0	12	24	12	9.882	0.007*
>8	18	36	19	38	37		
Job specification							
Supervisor	4	8	9	18	13	0.209	0.648
Bedside nurse	14	28	23	46	37		

P. >0.05 Non significant   P. <0.05* significant   P. <0.001* High significant.

Discussion:

Medicine administration is the act of preparing and administering medications through a specified route. The process involves the prescription, transcription, and also dispensing compounding, medication administration and ends with the monitoring and evaluation of their effects. The key role of nurses in most areas of working is the administration of drug. Nurses are accountable to ensure they have the necessary skills, knowledge and abilities to competently and safely medications administering **(Collage of Registered Nurses, 2017)**. Medication errors are a major problem in nursing. Since most cases of medication errors are not reported by nurses, nursing supervisors and managers must demonstrate positive responses to nurses who report medication errors in order to enhance patient safety.

Administrating medicines is the vital role and task performed everyday by nurses and considers one of the main aspects of providing safe patient care. The varied and multiple roles of nurses, complexity of the workplace and technical nature of the work environment may result in cognitive overload that may overwhelm nurses, which may possibly lead to medication errors. Medication errors are worldwide problems. All medication errors committed are considered critical events and some may cause harmful effect to the patients **(Lall, 2017)**. Therefore, this study was carried out to assess the nurses' perception regarding medication administration errors.

Regarding the demographic characteristics of the nurses under the present study, the results showed that nearly to two thirds of the studied nurses` age was below age of 41 years. This findings is consistent with **Shamsuddin and Shafie (2011)**, who stated that half of the nurses were aged between 25 to 30 year, in their study that entitled; " Knowledge of nurses in the preparation and administration of intravenous medication".

While nearly three quarters of nurses had more than eight years of working experience & were bedside nurses and also less than one fifth of nurses was with high qualifications. This is consistent with **Pournamdar and Zare (2016)** who found that more than half of the studied nurses had from one to five years of experiences in the study entitled "Survey of medication errors factors from nurses' perspective".

As regard to the nurses' level of knowledge regarding concept of medication administration errors, the present study revealed that, less than one quarter of nurses had knowledge about the definition of drug errors and less than half of them had knowledge about importance of directly signing after drug preparation and after drug administration. And also, about doing laboratory investigations before drug administration less than one quarter who do it. This results is related **Ebrahem and Elnagar (2016)**, in his study titled "Impact of Nursing Intervention Regarding Medications Errors on the Level of Psychiatric Nurses' Practice" who showed that the majority of the studied nurses had limited awareness of drug errors and safety measures to prevent errors before the interventions of administrating medications by nurses.

Regarding the total satisfactory level of knowledge regarding concept of medication administration errors, there was nearly to two thirds of nurses had unsatisfactory level of knowledge regarding common errors during drug administration. From the researcher point of view, this result confirm that is important for nurses to have more knowledge regarding drug administration concepts, drug actions, side effect and ten drug administration rights to avoid errors.

This finding is consistent with **Abo Elhares, (2018),** who found regarding the total nurses` knowledge, that less than three quarters of the studied nurses had unsatisfactory level of knowledge regarding drug administration, in his study entitled "Factors affecting nurses' performance regarding drug administration".

Related to the nurses' level of knowledge about the factors affecting nurses regarding common errors during drug administration. The present study displayed that, the all of nurses did not attend to the training courses of drug administration, and about shortage of nurses that causes errors, there was more than two thirds of it as causes of errors. As regards the errors occurs due to nurses rotation, it represented more than three quarters of rotation causes errors. About the morning shift errors and night shift errors that occurs it was nearly three quarters of errors occurred in morning shifts. From the researcher point of view, these findings reveal the vital role of identifying the surrounding factors that affect nurses' performance during administering medications.

This result is consistent with **Kimeu (2015),** who found that two thirds of the studied nurses did not have any training on how to administer or handle new medications that are introduced and given to the patients. That was in his study entitled "Factors influencing medication administration among nurses".

In relation to nurses' level of knowledge about the interventions for occurrence of errors during drug administration, this study revealed that, less than one third of nurses who can talk to avoid blaming and punishment, while all of nurses did not write incident report. Regard to reporting the supervisor and physician at shift, less than one quarter who does it. And also, regarding their level of knowledge regarding interventions, nearly two thirds of nurses had unsatisfactory level of knowledge regarding the interventions for occurrence of errors during drug administration. From the researcher point of view, these findings focus on the importance of directly supervising nurses' staff during their shift, and ensuring the nurses documentation by checking it continuously between shifts to detect any errors.

This results is consistent with **Murphy and While (2012)**, who found that more than two thirds of the studied nurses had insufficient level of practice regarding drug administration, in the study entitled " Medication administration practices among children`s nurses survey".

Regarding to relation between the demographic characteristics of nurses and nurses' level of knowledge regarding concept of medication administration errors, there was a highly statistically significant relation between nurses` level of knowledge regarding drug administration with age and qualifications. While there was statistically significant between nurses` level of knowledge regarding drug administration with and years of experience. From the researcher point of view, these findings clarify that the years of experiences and qualifications improve the nurses' professional skills that reduce the chances of getting errors during providing nursing care for patients.

This finding is related to **(Emanuele, et al., 2016),** who mentioned that nurses needs to improve their pharmacological knowledge for the proper medication administration of drugs and avoid errors, and is considered as prerequisite to the clinical evaluation of the effects on the patient. Knowledge is related to improving nursing practical skills.

Concerning to relation between the demographic characteristics of nurses and nurses' level of knowledge about the factors affecting nurses regarding common errors during drug administration, there was no statistically significant between demographic characteristics of nurses and nurses' level of knowledge about the factors. This finding is not with **Akram, Fatemah, and Arash, 2013),** in the study titled " Factors effective on medication errors: A nursing view" who stated that there were effective relation between nurse knowledge about drug administration and factors effecting on medication errors occurrence such as nurse-related factors that is related to socio demographic characteristics which were the most effective factors on drug errors.

Regards to the relation between demographic characteristics of nurses and nurses' level of knowledge about the interventions for occurrence of errors during drug administration, there was statistically significant between nurses' level of knowledge about the interventions for occurrence of errors during administrating drug, with age, qualifications and years of experience. These findings is consistent with **Mostafa, et al., (2020),** who found that there was a statistically significant relation between nurses' knowledge and their attitude and practice regarding medication administration. Moreover, there was a statistically significant association between nurses' years of experience and their knowledge regarding medication administration, in the study entitled "Knowledge, Attitude and Practice of Nurses in Administering Medications".

Conclusion

The results of this study concluded that:

Based on findings of the current study, can be concluded that, there was less than half of nurses had satisfactory level of knowledge regarding concept of medication administration errors, and there was statistically significant relation between nurses' level of knowledge about the interventions for occurrence of errors during drug administration, with age, qualifications and years of experience. **Recommendations:**

Based upon the findings of this study, the following recommendations were made:

*   In service education should be provided in hospital to improve nurses' performance regarding medication administration measures through implementing the training program regarding drug administration which must be up dated periodically.

*Proper planning and a comprehensive system to monitor the process of drug error reporting can reduce the number of errors and prevent complication.

* Establishing policy about medication administration revised and updated annually.

* Developing a simplified and comprehensive booklet including basic information about medication as; different types, abbreviation side effect and nursing role regarding prevention medication errors.

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