

Assessment of Pediatric Nurses' Knowledge Concerning Medication Administration Errors at Critical Care Units at Children Welfare Teaching Hospital in Baghdad City

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Abstract

Objective: assessing the nurses' knowledge toward medication errors and find out the relationship between the nurses' knowledge and socio-demographic data (age-gender-years of experience).

Methodology: The study was designed as a descriptive design non - probability purposive sample using a test-re-test approach. Participants employed were 40 nurses in the Children Welfare Baghdad City, Iraq

Results: the study outcomes include low assessment of nurses' knowledge to ward concerning medication administration errors.

Conclusion: Nurses' knowledge concerning medication administration errors was a low. There is no relationship between gender, age, and The number of years of work in the field of nursing in general with Nurses' knowledge

Recommendations: Prepare a structured educational program regarding medication administration errors to improve knowledge for nurse staff. The need for care guidelines with ongoing educational programs to increase and refresh nurses' knowledge about medication administration error.

Keywords: Assessment, Medication Administration, Critical Care Units

Introduction

Patient safety is a global issue and is a big problem facing healthcare systems today (Bernier, 2017). The topic of medication administration (MA) within the acute-care setting is an important aspect of patient safety and has long been the focus of scrutiny and study because it directly leads to patient morbidity and mortality (Park, et al., 2011).

Medication administration errors (MAE) happen as a consequence of the combination of the system- and human-induced causes, several factors such as lack of favorable environment, medication preparation, policies, negative work culture, lack of effective contact between health professionals, insufficient medication prescription system, exhaustion, inadequate training, and experience play a role in the happen of medication administration errors (Küçükakça and Özer, 2013).

Medication administration error (MAE) is widespread among the health care teams and may endanger the outcomes of all patients, but especially the pediatric population, Children are more likely to be subjected to medication administration errors (MAE) and are more vulnerable to harm due to factors such as variations in their growth and development and their physiological and psychological characteristics (Stavroudis, et al., 2010).

Medication administration errors are a global challenge and 18.7%-56% of hospitalized patients face medication administration errors (MAE) (Tshiamo, et al., 2015). A study done in Australia found that 60% to 80% of patients faced MAEs and omission errors accounted for between 40% to 60%. (Rahimi, et al., 2015). In Nigeria, the prevalence of (MAE) among

nurses was 64 percent, while 44 percent did not know of the existence of a reporting system, and a minority of 30 percent registered MAEs among pediatric nurses (Abdar., et al, 2014).

Patient damage was caused by almost 2.5 percent of pediatric medication errors. Improper dose/quantity 37.5 percent, followed by omission error (19.9 percent), unauthorized/wrong medication (13.7 percent), and prescription error (9.4 percent), followed by incorrect administration method, incorrect time, incorrectly prepared medication, incorrect dosage form, and incorrect route, were the most common forms of harmful pediatric medication errors. The most common causes of medication errors affecting pediatric patients were: performance deficit (43.0 percent), experience deficit (29.9 percent), non-compliance with procedure/protocol (20.7 percent) and poor communication (16.8 percent), accompanied by measurement mistake, insufficient or lack of supervision, incorrect use of the software of medication errors on the pediatric nurse (Fathy and Kabeel, 2016).

Nurses' education should equip nurses with an awareness of diversity to reduce factors contributing to medication errors, some of the universities reported an educational initiative called "Medication Safety Day" which is devoted to cultivating medication error prevention competencies among nursing students (Tshiamo, et al., 2015). The goal of this activity is to raise awareness about medication errors like name, transcription, prescription, and dispensing in order to prevent the occurrence of such errors and to encourage the reporting of these events when they do occur (Wang, et al., 2015).

Methodology

Design of the study

The study was designed as descriptive design using participants employed in the Children Welfare Teaching Hospital being, (in 24th January 2021).

Ethical considerations

The participants were fully acquainted with the current study and its aims and then voluntary verbal consent was obtained in order to participate in the study. Besides, the confidentiality of information obtained from nurses has been taken into account. Also, ethical approval was obtained from the ethical committee of research in the Faculty of Nursing/University of Baghdad regarding confidentiality and anonymity of participants

Setting of the Study:

The setting of the study was at the Children Welfare Teaching Hospital, in Baghdad city, Iraq which is a governmental hospital,

3.5. Sample of the Study:

A non - probability purposive sample selected from nurses who were working at the critical care units in Children Welfare Teaching Hospital. The sample (40) nurses
The present study conducted according to the following step:

Questionnaire parts

Part I: Demographic status includes the general information of the nurses like (age, gender, educational level, Number of years in the health field)

Part II: Contain five domains each one has multiple-choice questions, the participant shall choose one answer. The overall sum of questions within part II is thirty-one questions. The correct answers are used to test the participants' knowledge. The questionnaire items aim for study purposes and it involves relevant topics to the study subject and the educational program. The domains are:

Domain 1. Basic information about medication and medication errors.

Domain 2 .Nurses' knowledge of medication errors in the prescribing stage.

Domain 3. Nurses' knowledge related to medication errors that occur in the drug copying and distribution stages.

Domain 4. Nurses 'knowledge of medication errors that occur during drug administration.

Domain 5. Nurses' knowledge related to complications of treatment errors.

Statistical Analysis:

The following statistical data analysis approaches were used in order to analyze and assess the results of the study under the application of the statistical package (SPSS) ver. (22.0):

Descriptive data analysis

- a- Tables (Frequencies, and Percentages).
- b- Summary Statistics tables including: Observed Frequencies, Percent, Mean of score (MS), Grand Mean of Score (GMS), Global Mean of Score (GMS), Standard Deviation (SD), Pooled Standard Deviation (PSD), Relative Sufficiency (RS%), and grand/or Global Relative Sufficiency (GRS%), as well as scoring scales of two categories, such that (True, and False), with integer numbers **3.10.2. Inferential data analysis**

These were used to accept or reject the statistical hypotheses, which used inferential data analysis methods

Results and discussions

Part one : Discussion of the study sample by their socio-demographic characteristics. As shown in Table (1)

1.Gender:

The results of the present study reported that the distribution of the gender variable is different between the two groups, as it is high of males in the study group that was near three-quarters of the study sample (70%) and remaining were female. This result agrees with the study by (Abukhader and Abukhader, 2020), in Palestine show that the high percentage (53.8%) of nurses was male and the remaining was female.

While in the control group was high for females that were three-quarters of the study sample and the remaining were males (75%). This consistent with the study done by (Abusaad and Etawy 2015) in Egypt showed that the majority of the study sample (85. %) were female and the remaining were male

2.Age:

The majority of the nurse's participants in the present study in both study and control groups are in the age group from (20 - 29) years, this result agrees with the study done by (Ragheb and metwally, 2016) in Egypt that show the high percentage (74%) of the sample was less than 30 years.

3.Level of Education:

The results of the current study are found the majority of the sample in the study group were Secondary nursing school (50%). These result supported by a study done by (Fathy and Kabeel, 2016) in Egypt that showed the majority of the sample (81.6%) were secondary nursing school and then followed nursing institute (10.5%).

While In the control group, the majority of the sample was nursing institute (40%), this finding agrees with a study conducted in Egypt by (ragheb and metwally, 2016) which showed the high majority of the sample (42%) were nursing institute.

4.The number of years in the nursing field:

As to the number of years in the nursing field, this study declare is found of the majority of the sample (35%) in the study group was within from 1-5 years' experience in the nursing field, and This result agrees with the study by (Al-Youssif, et al., 2013) in Egypt that found the high percentage of nurses (59.3%) had less than 5 years of experiences.

In the control group, the majority of the sample (45%) was within from 5-10 years' experience in the nursing field, and this result agrees with the study by (Mohammadi, et al., 2013) which was conducted in Iran that showed the majority of the study sample (33.8%) had from 5-10 years of experience.

5. Did you participate in courses related to medication error?

The result of the current study in both the control and study groups showed that more than half did not participate in courses related to a medication error, while one-third participate in courses related to a medication error. These results agree with the study by (Mahmood and Kadhim, 2018) in Iraq that show in the study the most [(72%) in both study and control groups] of the nurses have never taken these sessions.

6. Current workplace

The result of the current study in (study group) showed the majority (45%) of nurses working in the Respiratory Care Unit, and these result supported by (Al-Youssif, et al., 2013) in Egypt that found the high percent (30.0%) of the nurse was working in respiratory care unit.

While in the (control group) the majority (40%) of nurses working in the Neonatal intensive care unit, and this agrees with the study done by (Abusaad and Etawy, 2015) which was conducted in Egypt that showed the majority of the study sample (42.5%) were working in intensive care units.

7. Years of experience in critical care units

The result of the current study showed the majority of both control and study group are nurses who have (1-5 years) of experience in the current workplace (60%) and (55%) of nurses in the study and control groups respectively, This result agrees with the study by (Latheeth. and Ahmed, 2017) in Iraq that found the high percentage of both groups are nurses who have (1-5 years) of experience in the current workplace (57.8%) and (52.2%) of nurses in the study and control groups respectively.

Part Two : nurses' knowledge concerning medication administration errors at critical care unit's main domains and overall assessment in Study

Table (2) shows a summary statistics of nurse's knowledge toward medication administration errors at critical care units according to main domains and overall assessment along studied

The results in present study show that a low level of knowledge concerning medication administration errors at critical care unit this results agree with study of (. Gracia el at 2019) who indicated Nurses have a low level of knowledge of the drugs they use the most and with which a greater

number of medication errors are committed in the ICU.

Part Three : Discussion of the association of nurses' knowledge and the demographic status for the study. As shown in table (3):

Table (3) shows that weak relationships are a proved with (SDCv.), since no significant relationships were accounted at $P > 0.05$, and according to that it could be concludes that studied questionnaire of pediatric nurses' knowledge concerning medication administration errors at critical care units at children welfare teaching hospital improvements through applying the suggested of assessment knowledge concerning medication administration errors could be generalize on the studied population even though differences within studied respondents socio-demographical characteristics variables, as well as differences within their experience variables concerning study subject's group.

These results are consistent with a study conducted by (Mahmood and kadhim, 2018) in Iraq which show that there is weak relationships are proved with (SDCv.), since no significant relationships are accounted at $P > 0.05$, and in accordance with that, it could be concluded that the studied questionnaire of studying assessments of nurse's relating to medication errors administration could be generalized on the studied population even though differences with socio-demographical characteristics variables of studied subjects would be in the study group. Also it agrees with (Latheeth and Ahmed, 2017) in Iraq which shows that no statistical significant association between nurses' knowledge concerning medication error with all

demographical characteristics. Also these result supported with study which was conducted in Egypt (Fathy and Kabeel, 2016) that showed there was no statistical significance between the demographic characteristics of nurses and their knowledge about total medication.

Conclusion: Nurses' knowledge concerning medication administration errors was a low. There is no relationship between gender, age, and The number of years of work in the field of nursing in general with Nurses' knowledge

Recommendations: Prepare a structured educational program regarding medication administration errors to improve knowledge for nurse staff. The need for care guidelines with ongoing educational programs to increase and refresh nurses' knowledge about medication administration error.

Table (1): Distribution of the samples according to (SDCv.)

SDCv.	Classes	No	%
Gender	Male	19	47.4
	Female	21	52.5
Age Groups Yrs.	20 _ 29	23	57.5
	30 _ 39	10	25
	40 _ 49	7	17.5
Level of education	Secondary nursing school	17	42.5
	Nursing Institute	15	37.5
	College of Nursing	7	17.5
	Master or PhD	1	2.5
Number of years in the nursing field Yrs.	1- 5	12	30
	5 _	15	37.5
	10 _	6	15
	≥ 15	7	17.5
Did you participate in courses related to the medication error?	No	23	57.5
	Yes	17	42.5
Current workplace	Emergency unit	13	32.5
	Neonatal intensive care unit	12	30
	Respiratory Care Unit	15	37.5
Years of experience in critical care units	1- 5	23	57.5
	5 _10	11	27.5
	10 _ 15	6	15

(*) NS: Non Sig. at $P > 0.05$; Testing based on a contingency coefficient (C.C.) test.

Table (2): Distribution of main domains and overall assessment

Domains and Overall Assessment	PGLMS	SD	Assessment
First axis: Basic information about medication and medication errors :	35.83	19.435	Moderate
Second axis: Nurses' knowledge of medication errors in the prescribing stage:	23.795	18.34	Low

Third axis: Nurses' knowledge related to medication errors that occur in the drug copying and distribution stages :	37.29	36.25	Moderate
Fourth axis: Nurses 'knowledge of medication errors that occur during drug administration :	19.85	12.975	Low
Fifth axis: Nurses' knowledge related to complications of treatment errors :	22.295	21.67	Low
Pediatric Nurses' Knowledge Concerning Medication Administration Errors at Critical Care Units :	26.39	10.61	Low
overall assessment	27.58	19.9	Low

Assessments Intervals Scoring Scales of Percentile Global Mean of Score (PGLMS):
[L: Low (0.00 – 33.3)]; [M: Moderate (33.3 – 66.7)]; [H: High (66.7 – 100)].

Table (3): Relationships (Analysis of Covariance) among overall " Nurses' Knowledge Concerning Medication Administration Errors " and some demographic data

Source of Variations	Type III Sum of Squares	d.f.	Mean Square	F Statistic	Sig. Levels	C.S. (*)
Gender	8.058	27	.298	1.869	.128	N.S
Age Groups	15.350	27	.569	.827	.674	N.S
Educational Levels	14.983	27	.555	.583	.881	N.S
Number of years in the nursing field	849.558	27	31.465	1.062	.477	N.S
Participation in courses	5.108	27	.189	.487	.941	N.S

Non Sig. at $P>0.05$; Statistical hypothesis based on Analysis of Covariance (ANCOVA)

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