

# Barriers to the Reporting of Hospital Medication Administration Errors As Perceived By Internship versus Baccalaureate Nursing Students

Sohair Mabrouk Mohammed Mabrouk.

Nursing Administration ph. N. Sc, Faculty of Nursing, Menoufyia University, Cairo, Egypt

---

**Abstract:** **Background:** Medication errors represent the largest single cause of errors in the hospital setting. The Institute of Medicine reports 44,000 to 98,000 people die in hospitals annually as a result of medical errors that could have been prevented. Hospital medication error rates can be as high as 1.9 per patient per day. It is estimated that 95% of medication errors are not reported because staff fear punishment. *So the study aimed to:* Assess perception of barriers to medication administration error reporting among nursing students. **Design:** A descriptive, across-sectional was used for this study. **Tools:** One tool used in data collection. Medication administration errors questionnaire; It composed of four parts; first part included demographic data, second part consisted questions regarding medication errors and an estimate of the number of nursing students made and reported medication errors, third part consisted barriers to reporting medication error and last part consisted of causes of medication error. **Subjects and Setting:** A 247 nursing students enrolled at faculty of nursing, in Menoufia Governorate, Egypt. **Results:** Number of error done by bachelor was higher than internship student; number of error reported by internship was higher than bachelor student. Fear barrier was the major barrier followed by administrative barrier. Bachelor students more agree with "physician's writing on the doctor's order form is difficult to read and internship students more agree with" Nurses are tired and exhausted **Conclusion:** the study concluded medication administration errors high occurrences among nursing students and often underreported. **Recommendation:** Nursing student's instructors must demonstrate positive responses to nursing students for reporting medication errors.

**Keywords:** Medication Errors, Nursing Students, Barriers, Reporting.

---

## 1. INTRODUCTION

A nurse is an integral part of the health care profession. They perform various duties in delivering nursing care to their patients. Among this is administering medications. Nurses' drug administration forms a major part of the clinical nurses' role. Medication administration by the nurse is only one part of a process that also involves doctors and pharmacists. In giving medications, some untoward incident may happen and medication errors may occur (Workmann and Bennett, 2003).

Medication administration errors (MAEs) are among the most prevalent health errors threatening patients' safety and are regarded as an index for determining patients' well-being in hospitals. It is defined as any type of error in the prescription, transcription, dispensing and administration process which could bring about serious consequences or not. MAEs represent the largest single cause of errors in the hospital setting. MAEs accounted for 7,391 deaths in 1993,

**International Journal of Novel Research in Healthcare and Nursing**

Vol. 3, Issue 1, pp: (14-26), Month: January-April 2016, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

compared to 2,876 deaths in 1983. United States of America data from 1993 indicates that 7,391 patients died from medication errors (**Kohn et al., 2000**).

According to **O'shea (1999)** there are various causes of MAEs. Errors may occur at any of the process steps: prescription, transcription, dispensing, or administration, mathematical ability of nurses, nurses' knowledge of medications, workload, length of nursing experience, and length of nursing shift are all contributing factors to medication errors. It is also believed that there is underreporting of medication errors. Most error-reporting systems rely on voluntary self-reporting and are imbedded into what remain largely punitive management systems. Nurses widely report reluctance to disclose medication errors, particularly if an error does not result in patient harm.

MAEs are a significant issue affecting patient safety and costs in hospitals often posing dangerous consequences for patients. It is important to understand that an analysis of medication errors can help healthcare professionals and managers identify why medication errors occur and provide insight into how to make improvements to prevent or reduce them. There are several types of MAEs such as wrong dosage, wrong patient, wrong route, wrong time, or wrong medication. The causes are also varied such as inexperienced or insufficient staff, or perhaps procedure or protocol not being followed (**Stetler et al., 2000**).

MAEs are caused by many health care professionals, such as physicians, pharmacists; however, nurses are usually placed on the frontline when medication errors occur (**Mrayyan et al., 2007**). Licensed registered nurses are responsible for the preparation, administration and evaluation of therapeutic responses to medications administered to patients. Assessment of student progress in developing requisite knowledge and skills is fundamental to the safe administration of medication. Because of students' limited clinical experience, they may be at risk of inadvertently making MAEs associated with medication administration. A logical assumption would be that by administering medications, there is an intention to improve patients' conditions while at the same time avoiding harm. Nursing educators emphasize the seriousness of medication administration and discuss safety strategies in classroom presentations and during clinical supervision (**Wolf et al., 2006**).

When a mistake is made, admitting and promptly reporting the error to an appropriate authority is the 'right thing to do'. This is because hiding errors can have serious adverse consequences at both a practical and a moral level. At the moral level, hiding errors especially those that are clinically significant may result in: besides, avoidable harm to patients, the nurse - patient trust relationship is being seriously undermined and, the good standing and reputation of the nursing profession as a whole being violated. Reporting MAEs cause to improve patient safety and providing valuable information for prevention of medication errors in the future. Reporting of MAE is as important as intercepting them for providing valuable information about 'near misses' and errors to manage existing errors and prevent future errors. When hospitals identify medication error trends and problem areas, they can prevent future errors and, therefore, reduce patient harm and injuries (**Johnstone and Kanitsaki 2006**).

Medication errors involving violation of the "five rights", context of medication administration, and dependence on medication administration systems such as medication administration report sheets and computers. The "five rights" of medication safety refer to the right patient, right drug, right dose, right time and right route. It is important to understand that an analysis of medication errors can help healthcare professionals and managers to identify why medication errors can occur and make improvements to prevent or reduce them (**Stetina, 2005**).

**1.1. Significance of the study:**

The rate of medication errors among nursing students was high and it may be more frequent than suspected (**Baghcheghi and Koohestani, 2010**). Assessing nursing students' viewpoints about barriers to reporting of MAE is a primary step to enhancing of reporting medication errors. So this study was conducted to assess underreporting of hospital medication MAES as perceived by internship versus baccalaureate nursing students.

**1.2. Aim of the study:**

To assess the perception of barriers to medication administration error reporting as perceived by internship versus baccalaureate nursing students.

## 2. RESEARCH QUESTIONS

1. Are the nursing students having awareness regarding MAEs?
2. What is the number of internship and bachelor nursing students made MAEs?
3. What is the number of internship and bachelor nursing students report MAEs?
4. What are the barriers to reporting of MAEs?
5. What are the causes of MAEs?
6. Is there difference between bachelor and internship nursing students regarding MAEs?

## 3. METHODS

**3.1. Design:** A descriptive, a cross-sectional study design was used in this study.

**3.2. Setting:** The study was conducted at faculty of nursing, in Menoufia Governorate, Egypt.

**3.3. Subjects:** The subjects were (247) students; divided into (107) nursing students who enrolled in the fourth year (2012-2013) and (140) nurses –intern who succeeded in the academic year 2011-2012.

**3.4. Tools:** One tool was used by the researchers to collect data.

**Medication administration errors questionnaire:** which was adopted and modified by the researcher based on review of related literature (Wakefield et al., 1996), it was used to assess reporting of hospital medication MAEs. It composed of four parts; the first part included demographic data as age, and program (fourth year academic- internship training). The second part consisted of 8 questions regarding medication errors to estimate the number of nursing students made and reported medication errors. In the third part consisted of 27 questions to assess nursing students' perceptions regarding barriers to reporting MAEs, it divided into 4 categories; barrier related to unaware 3 items, barrier related to fear 14 items, barrier related to reporting process 6 items and administrative barrier 4 items. In the fourth part consisted of 10 questions aims to identify nursing students' perceptions of causes of MAEs?

### 3.5. Scoring system:

Each item in the second part was assigned score (2) Yes, (1) No. While in third and fourth parts were assigned score (3) agree, (2) uncertain and (1) disagree. Standardized mean is calculated as Mathematical Mean divided by the number of items.

### 3.6. Validity of the tools:

The content validity of the translated questionnaire was evaluated by seven members of nursing faculty as a panel. The panel included three experts from medical-surgical nursing, two experts from community health nursing and two experts from nursing administration to ascertain relevance and completeness of the tool.

### 3.7. Reliability of the tool:

Reliability of the tools was done to determine the extent to which items in the tools are related to each other by Cronbach's alpha co-efficiency ( $\alpha = 0.97$ ). Pearson correlation co-efficiency was done to test the internal consistency ( $r = 0.02-0.98$ ) for all items of the tools.

### 3.8. Data Collection Methods:

Preparation of data collection tools was carried out over a period of three months from beginning of March 2014 to end of May 2014. The data collection took about four months from July to October, 2014 by using appropriate structure questionnaire.

### 3.9. Procedures:

An official letters were issued from the Dean of the Faculty of Nursing to facilitate collection of data. An oral consent was taken from nursing student. *Pilot study*; Twenty nursing student were included in the pilot study to identify the clarity, and applicability of tool. The data was gathered from internship student (July to August 2014). The questionnaires were

distributed during intern-nurse's work hours (morning and afternoon shifts) at the available hospital and faculty classroom, after two or three hours of her beginning shift and took one intern-nurse from each clinical unit to avoid patient care interruption. While the data collected from fourth year nursing students before and between their theoretical class hours according to their availability. The data collected through 3 days/week, the students were taken into groups, the numbers of students in each group were ranged from 10 to 15 students, and they taken from 40 to 45 minutes to complete questionnaire.

**3.10. Ethical consideration:**

Before beginning data collection from the nursing students. The researcher introduced herself to them, explained the objectives of the study, and informed them that their information will be confidential and will be used only for the purpose of the research. Additionally, each participant was notified about the right to accept or refuse to participate in the study. Their verbal consent was taken.

**3.11. Statistical analysis:**

Data were verified prior to computerized entry, followed by tabulation and data analysis. The Statistical Package for Social Sciences (SPSS) version 20 was used for that purpose. Descriptive statistics were applied (e.g., frequency, percentages, mean, and standard deviation,). A test of significance as chi-square was also used. Pearson correlation coefficients were used for investigation of the relationships among variables. A significant level value was considered when  $p \leq 0.05$ , and a highly significant level value was considered when  $p \leq 0.001$ .

**4. RESULTS**

**Table (1): Distribution of Number and percentage of nursing students' knowledge regarding medication administration error**

Knowledge	Studied students				$\chi^2$	P value
	Bachelor (n=107)		Internship (n=140)			
	No.	%	No.	%		
Age ( $\bar{X} \pm SD$ )	21.02±0.80		21.93±0.64		9.91*	<0.01(***)
<b>Number of students done error</b>						
• Not done	54	50.5	62	44.3	11.38	<0.05(*)
• Done (Once at least or more)	53	49.5	78	55.7		
<b>Number of students report error</b>						
• Underreported	85	79.4	76	54.3	17.83	<0.001(***)
• Reported (Once at least or more)	22	20.6	64	45.7		
<b>Awareness about Medication error definition</b>						
• Yes	96	89.7	140	100	15.06**	<0.001(***)
• No	11	10.3	0	0		
<b>Know what to do if do medication error</b>						
• Yes	85	79.4	106	75.7	0.480	>0.05
• No	22	20.6	34	24.3		
<b>Awareness about incident report</b>						
• Yes	78	72.9	96	68.6	0.545	>0.05
• No	29	27.1	44	31.4		
<b>Awareness about importance of reporting medication error</b>						
• Yes	94	87.9	104	74.3	7.017	<0.001***
• No	13	12.1	36	25.7		

\*Student t-test \*\*Fisher exact test (\*) significant, (\*\*\*) high statistically significant at  $p < .001$

Table 1. Illustrated distribution of studied students' knowledge regarding medication error. As reveals from the table, approximately half of bachelor student (49.5%) had done medication errors and around the majority (79.4%) of bachelor student unreported errors done. Also, more than half of internship nursing students (55.7%) done error and (54.3%) of them unreported. There was a highly significant difference between bachelor and internship students regarding number of medication error reported, knowing definition of medication error and knowing importance of reporting about medication error where  $p < 0.001$

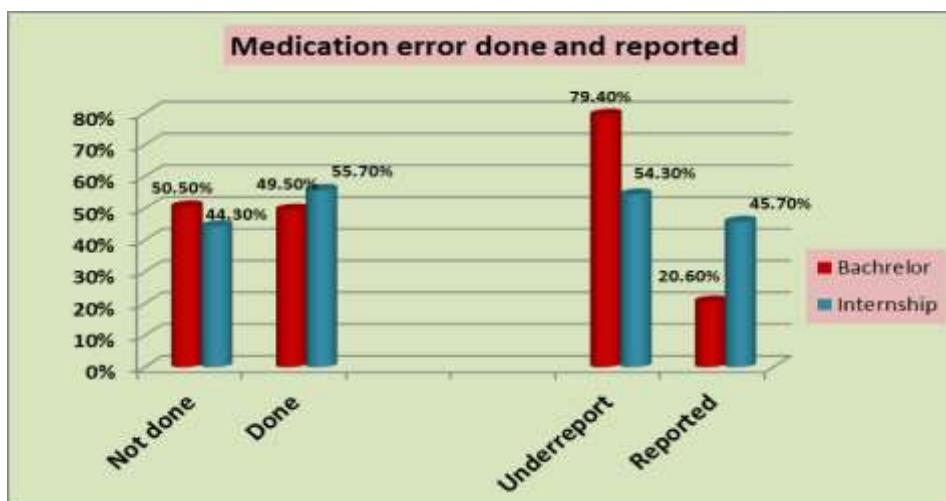


Figure (1): percentage of studied students done and reported medication error

Table (2): Distribution of mean score of unaware barrier as reported by studied students

Unaware barrier	Studied students		t-test	P value
	Bachelor (n=107)	Internship (n=140)		
	$\bar{X} \pm SD$	$\bar{X} \pm SD$		
- Don't know that error has occurred	1.81±0.83	1.64±0.79	1.99	>0.05
- Don't know reporting	1.97±0.87	1.41±0.68	5.43	<0.001(***)
- Don't know severity of non-reporting	2.14±0.89	1.38±0.68	7.31	<0.001(***)

(\*\*\*) high statistically significant at  $p < .001$

Table 2. Display distribution of mean score of unaware barrier as reported by studied group regarding medication administration error, as evident from the table bachelor student more agree with don't know reporting and don't know severity of non-reporting, their mean was (1.97±0.87 and 2.14±0.89 respectively) than internship students their mean was (1.41±0.68 and 1.38±0.68) respectively. There was highly statistically significant difference (P value <0.001).

Table (3): Distribution of standardized mean of barriers regarding reporting of medication error as reported by studied students (n=247)

Barriers	$\bar{x} \pm SD$
<b>Fear of:</b>	<b>1.93*</b>
Being recognized as incompetent	2.03±0.82
Patient or family's negative attitude	1.87±0.72
Physician 'reprimand	1.91±0.59
Decreased evaluation score	1.90±0.73
Instructor's reprimand	1.83±0.65
Side effects of drugs	2.19±0.68
Nursing staff' reprimand	1.94±0.62
Authority reprimand	1.87±0.64
Lawsuits	2.06±0.71
Loss professional registration	2.06±0.71
Disciplinary action	2.00±0.69

Peers reactions	1.38±0.60
<b>Total Fear score</b>	<b>23.10±5.97</b>
<b>Reporting process</b>	<b>1.57*</b>
Think MAEs not important enough to be reported	1.37±0.65
Too much time for contacting instructor	1.58±0.64
Unclear MAEs definition	1.53±0.65
Forget to report	1.59±0.65
Don't anticipate giving drug	1.80±0.70
<b>Total Reporting process score</b>	<b>7.89±2.59</b>
<b>Administrative barrier</b>	<b>1.85*</b>
No positive feed back	1.85±0.67
Much emphasis on MAEs as nursing performance provided	2.02±0.68
Focus on individual rather system factors to MAEs	1.98±0.75
Instructor's responses to MAEs do not match the severity of the error	1.53±0.67
<b>Total Administrative barrier score</b>	<b>7.39±2.32</b>
<b>Total barrier score</b>	<b>38.40±8.41</b>
	<b>1.82*</b>

\*standardized mean

Table 3. Show distribution of standardized mean of barriers regarding reporting of medication error reporting, as this table demonstrates the highest mean barrier is fear (1.93). The studied students have highest level of agreement with “fear of side effect of drugs”. The next barrier is administrative barrier (1.85). Also the studied students have with highest agree with “Much emphasis on MAEs as indicator for nursing performance provided”. While the weakest barrier is reporting process (1.57).

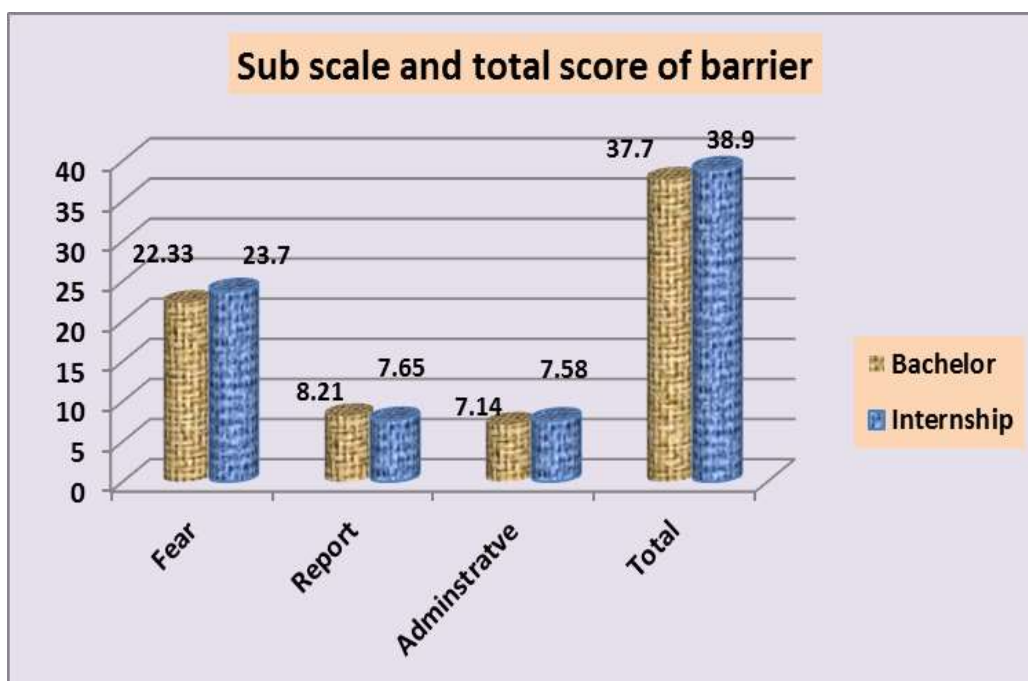


Figure (2): Distribution of standardized mean of barriers regarding reporting of medication error as reported by studied students



International Journal of Novel Research in Healthcare and Nursing

Vol. 3, Issue 1, pp: (14-26), Month: January-April 2016, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

**Table (4): Distribution of standardized mean of fear barrier regarding reporting of medication error as reported by studied students. (n=247)**

Fear barrier	Studied students		t-test	P value
	Bachelor (n=107)	Internship (n=140)		
	$\bar{X} \pm SD$	$\bar{X} \pm SD$		
• Being recognized as incompetent	1.89±0.85	2.14±0.78	2.34	<0.05(*)
• Patient or family’s negative attitude	1.75±0.77	1.97±0.67	2.27	<0.05(*)
• Physician reprimand	1.80±0.55	2.00±0.61	2.59	<0.05(*)
• Decreased evaluation score	2.02±0.89	1.81±0.57	2.15	<0.05(*)
• Instructor’s reprimand	2.00±0.72	1.70±0.57	3.76	<0.001(***)
• Side effects of drugs	2.05±0.75	2.30±0.61	2.79	<0.001(***)
• Nursing staff’ reprimand	1.94 ±0.58	1.94 ±0.65	0.01	>0.05
• Authority reprimand	1.75±0.58	1.97±0.67	2.61	<0.001(***)
• Lawsuits	1.94±0.71	2.15±0.71	2.33	<0.05(*)
• Loss professional registration	2.10±0.71	1.81±0.68	3.22	<0.001(***)
• Disciplinary action	1.81±0.63	2.15±0.71	3.94	<0.001(***)
• Peer’s reaction	1.42±0.63	1.35±0.58	0.93	>0.05
<b>Total (23.10±5.97)</b>	<b>22.33 ±6.26</b>	<b>23.70 ±5.69</b>	<b>1.78</b>	<b>&gt;0.05</b>

(\*) significant, (\*\*\*) high statistically significant at  $p < .001$

Table 4 shows mean and standard deviation of studied group regarding fear barrier. As illustrated from the table both groups more agree that they fear of side effect of drugs (2.05±0.75 and 2.30±0.61). While Bachelor students more agree with fear of “Decreased evaluation score, instructor’s reprimand and loss professional registration” (2.02±0.89, 2.00±0.72 and 2.10±0.71) respectively than internship (1.81±0.57, 1.70±0.57 and 1.81±0.68) respectively. There are highly statically significant difference p value <0.001.

**Table (5). Distribution of standardized mean of reporting process barrier regarding reporting of medication error as reported by studied students (n=247)**

Reporting process barrier	Studied students		t-test	P value
	Bachelor (n=107)	Internship (n=140)		
	$\bar{X} \pm SD$	$\bar{X} \pm SD$		
• Think MAEs not important enough to be reported	1.59±0.77	1.20 ±0.46	4.69	<0.001(***)
• Too much time for contacting instructor	1.72 ±0.77	1.48±0.50	2.71	<0.001(***)
• Unclear MAEs definition	1.62 ±0.79	1.47±0.50	1.76	>0.05
• Forget to report	1.68 ±0.74	1.52±0.55	1.78	>0.05
• Don’t anticipate giving drug	1.58±0.71	1.97±0.65	4.32	<0.001(***)
<b>Total (7.89±2.59)</b>	<b>8.21±3.42</b>	<b>7.67±1.69</b>	<b>1.54</b>	<b>&gt;0.05</b>

(\*) significant, (\*\*\*) high statistically significant at  $p < .001$

Table 5 display standardized mean score and standard deviation of studied students regarding reporting process barrier. As illustrated from the table bachelor student more disagree with “think MAEs not important enough to be reported and too much time for contacting instructor” (1.59±0.77and1.72 ±0.77) respectively than internship (1.20 ±0.46 and1.48±0.50) respectively. While the internship student more disagree with “don’t anticipate giving drug” (1.97±0.65) than bachelor student (1.58±0.71) . There was highly statically difference significant p value <0.001.

**Table (6): Distribution of standardized mean and standard deviation regarding administrative barrier as reported by of studied group (n=247):**

Administrative barrier	Studied group		t-test	P value
	Bachelor (n=107)	Internship (n=140)		
	$\bar{X} \pm SD$	$\bar{X} \pm SD$		
• No positive feed back	1.76 ±0.75	1.91±0.60	1.65	>0.05
• Much emphasis on MAEs as nursing quality provided	2.01 ±0.65	2.03 ±0.71	0.21	>0.05
• Focus on individual rather system factors to MAEs	1.78 ±0.77	2.14±0.70	3.73	<0.001(***)
• Instructor's responses to MAEs do not match the severity of the error	1.58±0.76	1.50±0.60	0.98	>0.05
<b>Total (7.39±2.32)</b>	7.14±2.63	7.58±2.06	1.41	>0.05

(\*) significant, (\*\*\*) high statistically significant at  $p < .001$

Table 6 display standardized mean and standard deviation of studied students regarding administrative barrier. As illustrated from the table both groups more agree with that "Much emphasis on MAEs as nursing quality performance provided " (2.01 ±0.65 and 2.03 ±0.71). the Internship student more agree with "Focus on individual rather system factors to MAEs" (2.14±0.70) than bachelor student (1.78 ±0.77). There was highly statically difference significant p value <0.001.

**Table (7): Distribution of total standardized mean score of barriers regarding MAEs reporting among studied students (n=247)**

Barrier regarding MAEs	Studied students		t-test	P value
	Bachelor (n=107)	Internship (n=140)		
	$\bar{X} \pm SD$	$\bar{X} \pm SD$		
<b>Fear</b>	22.33±6.26	23.70±5.69	1.78	>0.05
<b>Reporting process</b>	8.21±3.42	7.65±1.69	1.54	>0.05
<b>Administrative</b>	7.14±2.63	7.58±2.06	1.41	>0.05
<b>Total score</b>	37.7 ±9.81	38.9±7.15	1.15	>0.05

Table 7. display total standardized mean score of barriers regarding MAEs reporting among studied students , as evident from the table, there is no statistically significant difference between studied group regarding total barrier scores and sub scores, P value >0.05.



**Table (8): Distribution of standardized mean score of causes of medication administration error as reported by studied students (n =247).**

Causes of medication administration error	Studied students		t-test	P value
	Bachelor (n=107)	Internship (n=140)		
	$\bar{X} \pm SD$	$\bar{X} \pm SD$		
The nurse fails to check the patient’s name band with the Medication Administration Record (MAR).	2.44±0.67	2.04±0.59	4.91	<0.001(***)
The physician’s writing on the doctor’s order form is difficult to read or illegible.	2.67±0.56	1.57±0.49	16.30	<0.001(***)
The medication labels/packaging are of poor quality or damaged	2.02±0.50	1.87±0.84	1.80	>0.05
There is confusion between two drugs with similar names.	2.11±0.34	2.32±0.47	4.16	<0.001(***)
The physician prescribes the wrong dose.	2.01±0.47	1.72±0.44	4.87	<0.001(***)
The nurse miscalculates the dose	2.16±0.37	2.21±0.60	0.731	>0.05
The nurse sets up or adjusts an infusion device incorrectly.	2.23±0.44	1.90±0.30	6.65	<0.001(***)
Nurses are confused by different types and functions of infusion devices	2.15±0.35	1.78±0.41	7.40	<0.001(***)
Nurses are distracted by other patients, coworkers or events on the unit.	2.05±0.50	2.47±0.50	6.59	<0.001(***)
Nurses are tired and exhausted	2.25±0.64	2.52±0.50	3.78	<0.001(***)

(\*) significant, (\*\*\*) high statistically significant at  $p < .001$

Table 8 displays distribution of standardized mean score of causes of medication administration error among the studied students. As evident from the table bachelor student more agree with "physician’s writing on the doctor’s order form is difficult to read or illegible and nurse fails to check the patient’s name band with the (MARs)” (2.67±0.56 and 2.44±0.67) respectively than internship (1.57±0.49 and 2.04±0.59) respectively. also the internship more agree with” Nurses are tired and exhausted and Nurses are distracted by other patients, coworkers or events on the unit.” (2.52±0.50 and 2.47±0.50) respectively than bachelor student (2.25±0.64 and 2.05±0.50) respectively. There was highly statically difference significant p value <0.001.

### 5. DISCUSSION

A medication administration error (MAEs) is important topic in health care, and recognition of the factors contributing to the latter may decrease the frequency and consequently improve patient safety and the quality of care. (Khosravi, 2008)

Recognition of reasons for not reporting MAE among nursing students is crucial to determining interventions that support reporting of all errors, including those related to medication administration. The most important step in decreasing medication errors appears to be in knowing the accurate rate of occurrence. Occurrence data can only be used to identify problems and develop solutions provided it is a true reflection of the type and number of medication errors that occur. Accuracy can only be improved in an environment that encourages and supports the reporting of medication errors. (Baghcheghi and Koohestani ,2010).

The present study aims to assess underreporting of MAEs as perceived by internship versus baccalaureate nursing students through; assessing nursing students awareness about MAEs (definition, incident report, importance of reporting and severity of underreporting), estimating number of medication errors made and reported by internship and bachelor nursing students, assessing nursing students’ viewpoints about barriers and causes to reporting of MAEs and comparing between bachelor and internship nursing students regarding MAEs.

**Knowledge regarding MAEs** - The result of the present study illustrated that number of medication errors done and underreported by internship student was higher than bachelor students. Approximately, half bachelor student medication errors done at least one error. Also more than half of internship students medication errors done. Regarding reporting, the majority of bachelor student not reported errors done. It may be the clinical experience of students is inadequate thus, nursing students run the risk of 'doing something wrong'.

The result supported with **Hosseinnejad and Kalantarzadeh(2013)** reported that more than half of the nursing students had made MAEs, and the rate of underreporting was calculated forty percent. While the result of study was incongruence with **Koohestani and Baghcheghi, (2008)** who mentioned that thirty percent of the participants reported making at least one error during their academic period. However, in actual fact the frequency of medication errors is likely to be even greater. **Balas et al., (2004)** showed approximately one third of participants reported making at least one error during a 28 day period.

The present study deduced that the rate of MAEs is high among nursing students and the medication errors are a major problem in the field of nursing, it may be attributed to training deficiencies, and nursing shortages that may have contribute to medication errors by nursing students. The result matched with **Kohestani, Baghcheghi, Khosravi, (2008)** stated that more than one quarter of medication errors made by nursing students were not reported to their instructor. Also the rate of medication errors were often underreported by nursing students.

In the same line **Baghcheghi and Koohestani (2010); Rachel, (2012)**, showed the overall average estimate of medication errors by nursing students was more than eighty percent. Also **Sanghera, et al., (2007)** They stated that some staff nurse reported only certain errors or errors that resulted in harm.

This result inconsistent with (**Wakefield, et al., 1999 and Stratton et al., 2004;**) indicated that more than two thirds of pediatrics and adult nurses were reported all MAEs in their patient care units. Also, the study findings of **Kohestani, Baghcheghi, Khosravi, (2008)** indicated that three quarter of medication errors committed by nursing students were reported to the instructor.

In relation to causes of non-reporting MAEs. The finding revealed that, the bachelor student more agreed with don't know reporting and severity of non-reporting than internship students. The recognition of reasons for not reporting MAEs among nursing students is crucial to determining interventions that support reporting of all errors, including those related to medication administration. In same line **Yang, (2003)** who reported that proper understanding of barriers and causes of MARs is the first step toward preventing them.

The result supported with **Sanghera et al., (2007)** who indicated that the barriers to reporting included; not being aware that an error had occurred, reporting process (e.g. detailed paperwork), no benefit to reporting (perception that nothing is done with the data) and motivational factors (e.g. fear of loss of professional registration).

The results of the present study revealed that the highest mean barrier of MAEs reporting was fear. The next barrier was administrative barrier; while the lowest mean barrier was reporting process. This result was consistent with **Baghcheghi and Koohestani (2010)** who stated that nursing students agreed that fear and administrative barriers were the main reasons for not reporting MAEs. Also the findings of the present study were supported with previous studies that using the same study instrument (**Blegen et al., 2004;Chiang and Pepper 2006**). They indicated that the strongest perceived barriers to MAEs reporting were administrative barriers.

This finding was congruent with **Stratton et al., (2004)** who indicated that the nurse respondents agreed with both individual/personal and management related reasons for not reporting medication errors.

In relation to fear barrier, the present study indicated that both groups of the studied students agreed with the fear of side effect of drugs. Bachelor more agreed with fear of decreased evaluation score and instructor's reprimand while internship students more agreed with fear of being recognized as incompetent, physician' reprimand, lawsuits and disciplinary action. There was highly significant difference.

This finding was congruent with findings of **Stratton et al., (2004)** who mentioned that the fear of adverse consequences was primary reasons selected for not reporting medication errors. The result consistent with **Karadeniz and Cakmakci (2007)** who stated that fear is one of the primary individual barriers that impede error reporting among nurses. Fear of

reprimand from those in authority and disciplinary action. This result was congruent with **Manias and Bullock (2002)** who stated that the major reasons for underreporting were fear of low evaluation scores, reprimand and punishment. Also, the result inconsistent with **Karadeniz and Cakmakci (2007)** they emphasized that most of nurses did not report MAE because they fear from manager and peer negative responses. Also **Uribe et al., (2002)** who reported that the nurses did not reported MAE because they fear from blamed and lawsuits.

The strongest perceived barrier was fear. Standardized mean of this sub score was high, indicating the fear subscale was located between slight agreement and agreement. The primary barriers this sub score were decreasing evaluation score and introducing educational problems, instructor's reprimand. Compared to the standardized mean of all items, fear of decreasing evaluation score and introducing educational problems was considered as a major barrier. Nature of the instructor's response to errors is an important factor to reporting MAEs among nursing students. It has been suggested that punishment has little effect on future error prevention (**McCarthy et al., 1992**).

Concerning reporting barriers the findings of the present study indicated that the weakest perceived barrier was the reporting process and the bachelor student more disagreed with "think MAEs not important enough to be reported and too much time for contacting instructor" than internship. This may be the student still trained in clinical site and they have not responsible for patient care. This results were similar with **Workmann and Bennett, (2003)** who mentioned that mean score of the reporting process was located between disagreement and agreement. Also, the respondents indicated they somewhat agreed with "think MAEs not important enough to be reported".

Regarding administrative barriers, the present study revealed that both groups more agreed with "much emphasis on MAEs as nursing quality provided". While the internship student more agreed with "focus on individual rather system factors to MAEs" than bachelor student. There was highly significant difference. The primary administrative barriers were related to no positive feedback for giving medication correctly and too much emphasis on MAE as a quality indicator of nursing care.

This finding was congruent with **Stratton et al., (2004)** who mentioned that administration's focus on the person rather than the system was primary reasons selected for not reporting medication errors. Also **Baghcheghi and Koohestani, (2010)** who reported that the barriers of reporting MAEs was related to instructor's management. In the same line **Aiken et al., (2002)** who stated that, If medication errors are used as an indicator of an individual's performance or in a punitive manner, nursing students may be reluctant to report their own errors. They have no tendency to accept responsibility for errors in which they were the final player in a complex series of events leading to the error.

Regarding cause of errors the present study shows that, bachelor student more agreed with "physician's writing on the doctor's order form is difficult to read and nurse fails to check the patient's name band with the (MARs)" than internship student. While internship student more agreed with "nurses are tired and exhausted and nurses are distracted by other patients, coworkers or events on the unit" than bachelor student. There was highly difference significant.

This result was incongruent with **King (2004) and Manias and Bullock (2002)** stated that the most important causes of MAEs were illegible data cards and prescriptions. Also **Harding and Petrick (2008)** found that the three categories of causes contributing of medication errors made by nursing students were; rights violations, system factors, and knowledge and understanding. While **Wolf et al., (2006)** found the most prevalent cause of student medication errors was student performance deficits. Moreover, (**Koohestani and Baghcheghi 2008; King 2004; Manias and Bullock 2002; MorrisonGriffiths et al., 2002**) they reported that there was inadequacy of the pharmacology content that included in present nursing education curricula.

For instance, the results of **Koohestani and Baghcheghi (2008)** indicated the most prevalent cause of medication errors made by nursing students was poor pharmacologic knowledge, poor mathematical skill that can contribute significantly to increasing the risk of administration error. Research study showed nurses and student nurses difficulties with basic mathematical skills and medication calculation abilities (**Weeks et al., 2000**). So, It is important to understand causes and barriers of medication errors reporting, the nursing students will report errors, but the likelihood of reporting errors is influenced by the perceived punitive climate of the instructor or organization so comprehensive strategies are required to improve medication safety and to promote reporting of medication errors among nursing students.

## 6. CONCLUSION

The findings of this study concluded that, there were high occurrence of medication administration error among nursing students and often underreported. Fear and administrative barriers were the main reasons for not reporting medication administration errors among nursing students. Moreover the fear of side effects of medication was found to be the highest rated primary individual barriers that impede error reporting among nursing students.

## 7. RECOMMENDATIONS

**Based on study findings the following were recommended:**

- Medication administration errors (MERS) must be emphasized in the undergraduate curricula to decrease or prevent the occurrence of medication administration errors and improve medication safety.
- Conduct orientation session by academic staff and hospital managers to increase nursing student awareness about MERS and their commitment to reporting of these errors
- Continuous supervision and appraisal interview should be conducted with nursing student through daily, weekly discussion and at the end of clinical experience by her immediate supervisor to discuss her performance and shortcoming. This sharing evaluation could provide positive feedback; increase their sense of trust and encouragement to reporting their errors.
- Creating an environment encouraging to the reporting of errors requires a systems approach to patient safety.
- The nursing instructor should be accept mistakes made by nursing students and produce system flaws, not character flaws because the students who make mistakes are not necessarily poor students

## REFERENCES

- [1] Aiken L, Clarke S, Sloane D, Sochalski J, Silber J.(2002): Hospital nurse staffing and patient mortality, nurse burnout, and job dissatisfaction. *JAMA*; 288(16): 1987–93.
- [2] Baghcheghi, N. and Koohestani, N. (2010): Barriers to the reporting of medication administration errors among nursing students *Australlan Journal of Advanced Nursing* 27 (1).
- [3] Balas, M.A., Vaughn, T., Pepper, G., Vojir, C., Stratton, K. and Boyd, M. (2004): Patient and staff safety: Voluntary reporting. *American Journal of Medical Quality*, 19(2):6774.
- [4] Chiang HY, Pepper GA.(2006): Barriers to nurses' reporting of medication administration errors in Taiwan. *J Nurs Scholarsh*; 38(4): 392-9.
- [5] Harding L. and Petrick T. (2008) Nursing student medication errors: a retrospective review. *Journal of Nursing Education*, 47(1):4347.
- [6] Hosseinejad,M. and Kalantarzadeh,M. (2013):Underreporting of medication errors in nursing students: a threat to patient safety. *American Journal of Medical Quality*, 19(2):6774.
- [7] Johnstone, M.J. and Kanitsaki, O. (2006): The ethics and practical importance of defining, distinguishing and disclosing nursing errors: a discussion paper. *International Journal of Nursing Studies*, 43(3):367376.
- [8] Karadeniz, G. and Cakmakci, A. (2007): Nurses' perceptions of medication errors. *International Journal of Clinical Pharmacology Research*, 22(1):2833.
- [9] King, R.L. (2004): Nurse's perceptions of their pharmacology educational needs. *Journal of Advanced Nursing*, 45(4):392-400.
- [10] Kohestani HR, Baghcheghi N, Khosravi SH. (2008):Frequency, Type and Causes of Medication Errors In Student Nurses. *Iran J Nurs* 2008; 21(53) :17-27. [in Persian]

**International Journal of Novel Research in Healthcare and Nursing**

 Vol. 3, Issue 1, pp: (14-26), Month: January-April 2016, Available at: [www.noveltyjournals.com](http://www.noveltyjournals.com)

- [11] Kohestani HR, Baghcheghi N, Khosravi SH.(2008): Frequency, Type and Causes of Medication Errors In Student Nurses. *Iran J Nurs*; 21(53) :17-27. [in Persian]
- [12] Kohn, L.T., Corrigan, J.M. and Donaldson, M.S. (2000): *To err is human: building a safer health system*. Institute of Medicine Committee on Quality of Health Care in America. Washington, DC: National Academies Press.
- [13] Manias, E. and Bullock, S. (2002): The educational preparation of undergraduate nursing students in pharmacology: perceptions and experiences of lecturers and students. *International Journal of Nursing Studies*, 39 (7):75-77.
- [14] Morrison, A., Griffiths, S., Snowden, M.A. and Pirmohamed, M. (2002): Preregistration nurse education in pharmacology: is it adequate for the roles that nurses are expected to fulfil? *Nurse Education Today*, 22(6):44756.
- [15] Mrayyan MT, Shishani K, Al-Faouri I. Rate,(2007): Causes and reporting of medication errors in Jordan: nurses' perspectives. *J Nurs Manag*; 15(6): 659-70.
- [16] O'shea,A (1999): Incidence and preventability of adverse drug events in hospitalised adults. *Journal of General Internal Medicine*, 8(6):28994.
- [17] Sanghera, IS., Franklin, BD., Page, K and Dhillon, S. (2007): The attitudes and beliefs of healthcare professionals on the causes and reporting of medication errors in a UK Intensive care unit. *Anaesthesia*, 62(1):5361.
- [18] Stetina,N., (2005): Drug calculation competencies of graduate nurses. *Collegian*, 4(3):1821.
- [19] Stetler, C.B., Morsi, D. and Burns, M. (2000): Physical and emotional patient safety: a different look at nursing sensitive outcomes. *Outcomes Management of Nursing Practice*, 4(4):159165.
- [20] Stratton KM, Blegen MA, Pepper G, Vaughn T. (2004):Reporting of medication errors by pediatric nurses. *J Pediatr Nurs*; 19(6): 385-92.
- [21] Uribe, C.L., Schweikhart, S.B., Pathak, D.S., Dow, M. and Marsh, G.B. (2002): Perceived barriers to medical error reporting: An exploratory investigation. *Journal of Healthcare Management*, 47(4):263-279.
- [22] Wakefield, D.S., Wakefield, B.J., Uden Holman, T. and Blegen, M.A.(1996): Perceived barriers in reporting medication administration errors. *Best Practices and Benchmarking in Healthcare*, 1(4):191-197.
- [23] Wakefield, D.S., Wakefield, B.J., UdenHolman, T., Borders, T., Blegen, M. and Vaughn, T. ( 2009): Understanding why medication administration errors may not be reported. *American Journal of Medical Quality*, 4(2):81-88.
- [24] Weeks, K., Lyne, P. and Torrance, C. (2000): Written drug dosage errors made by students: the threat to clinical effectiveness and the need for a new approach. *Clinical Effectiveness in Nursing*, 4(2):20-29.
- [25] Wolf, Z.R., Hicks, R. and Serembus, J.F. (2006): Characteristics of medication error made by Student during the administration phase. *Journal of Professional Nursing*, 22(1):39-51.
- [26] Workman, D.M. and Bennett, (2003): Reducing medication errors and increasing patient safety: case studies in clinical pharmacology. *Journal of Clinical Pharmacology*, 43(7):76-83.
- [27] Yang, S.D (2003): Medication calculation skills of registered nurses. *The Journal of Continuing Education in Nursing*, 19(6):258-262.