Medication Administration Errors and Barriers to Reporting: Critical Care Nurses' Point of View

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ABSTRACT

Medication administration errors (MAEs) are a common cause of harm and death in the healthcare sector. These errors not only compromise patient safety but also cost a lot of money around the world. Nurses must report MAEs so that healthcare systems can identify the causes and take preventative measures. **This study aim**s to explore the causes of medication administration errors and barriers to reporting from a critical care nurses' point of view. **Method:** In the current study, a descriptive research design was employed. A convenience sample of 60 critical care nurses from Mansoura Emergency Hospital with a range of educational backgrounds and at least six months of ICU experience participated in the current study. Data were collected using one tool consisting of three parts, part I: Nurses' socio-demographic characteristics, Part II: Causes of medication errors, and Part III: Barriers to MAEs reporting. **Results**: heavy workload was the highest possible cause of MAEs (93.33%) among the studied nurses. Additionally, fear factors were perceived as the highest barriers to reporting MAEs with a total score of 44.2±4.9. **Conclusion and Recommendations:** From critical care nurses' point of view, fear of consequences was the strongest perceived barrier to reporting MAEs. Continuous and effective education programs should be provided for all nurses about MAEs and open feedback systems are required for motivating nurses to report medication errors.

Keywords: Medication Administration Error, Barriers, Reporting, Critical Care Nurses

Introduction

Intensive care units (ICUs) are vital components of hospitals that provide critical and life-threatening care to patients (**Tan TC, 2017**). Improving care quality and ensuring patient safety are basic challenges (Driscoll **A, 2018**). Every day, approximately 178 different procedures and tasks are performed for each ICU patient, reflecting the high workload in these units (**Härkänen, 2017).** In the acute-care setting, the issue of medication administration is being researched. Every step in a nursing professional's patient care is a potential opportunity for error, posing a risk to the patient's safety (**Dirik, 2018).**

Medication errors (MEs) are a serious and complex problem in clinical practice, particularly in ICUs, where patients' critical illnesses can have potentially fatal consequences (**Gracia et al., 2020). **According to the World Health Organization, adverse events caused by errors are one of the top ten leading causes of disability and death worldwide **(WHO, 2019).** Medication administration errors cause the death of one person every day and injure approximately 1.3 million people in the United States of America alone each year (**WHO, 2020).** Several studies have reported incidences of 10%, 19.5 %, and 22.2 %, respectively in developed countries (**Cottney & Innes, 2015; Yung et al., 2016),** while studies in developing countries have found very high MAEs rates of 94% (**Blignaut et al., 2017).**

Medication errors are defined as "any avoidable event that could result in improper medication use or patient harm while the medication is in the control of the patient, consumer, or healthcare professional" **(NCCMERP, 2017)**. Incompetent practice, order communication, product labeling, dispensing, monitoring, and education may all be factored into such events (**Driscoll, 2018)**. The administration of medications is a routine part of nursing practice and involves much more than just performing a psychomotor task. In actuality, it reflects the intricate interactions of numerous particular choices and actions **(Shawahna,, 2016).** Medication mistakes can happen at any stage of the medication administration process, including the prescribing, transcription, dispensing, preparation and administration, (**Pentin et al., 2016).** The MAEs can be discovered using a variety of methods, including direct observation, patient chart review, incident reports review, attendance at medical rounds, and staff interviews (**Muroi et al., 2017).**

Failures in communication, such as transcription errors, abbreviations, illegible handwriting, incorrect interpretation of a doctor's orders, verbal orders, and failure to record medications given are a few of the

causes of MAEs (**Azimi et al., 2016**). Other factors include individual staff traits such as inadequate knowledge and skills, which typically reflect ignorance of patient names, diagnoses, and proper medication administration as well as ignorance of how to operate infusion devices and inadequate medication preparation before administration (**Murphree, 2018**) and failure of monitoring medications side effects (**Mehrabifar et al., 2017**).

Other factors that affect staff performance with medication administration are the number of nurses' years of experience, the number of consecutive hours of work, rotating shifts, workload, distractions, and interpretations (**Vaismoradi et al., 2014; Thomas et al., 2017**). Finally, drug companies contribute to MAEs by coming up with drug names that are similar in appearance and sound, confusing and unclear labeling, and confusing dose packaging (**Aljasmi et al., 2018**).

Critical care nurses play multifarious roles during the medication administration process, including accurate and appropriate preparation and administration of medication; ensuring that the correct patient receives the correct drug and dose, delivered via the proper route and at the appropriate time (**Shebl,2020**). Checking medications, keeping track of their effects, educating patients about medications,

and keeping nurses' knowledge of medications current are additional tasks in this process. (**Tshiamo et al., 2015**).

Reporting MAEs is a crucial and initial step in error prevention because it helps to identify potential risks and harm as well as gives information on defective systems. (**Goedecke et al., 2016**). Also it helps to avoid future errors that can cause patient harm and reduces the adverse effects and thus diminishing personal suffering and decreasing financial costs (**Jember et al., 2018**). Clinicians, managers, and researchers have the opportunity to examine potential future practice to reduce the likelihood of MAEs as a result of the identification and reporting of MAEs data. (**Wolf & Hughes, 2019**).

Reporting errors is a completely voluntary process. As a result, underreporting is a significant problem (**Yang et al., 2019**). Fear has been identified as a major barrier to reporting in numerous studies either in hospital (**Alqubaisi et al., 2016; Yung et al., 2016**). A study done by **Lee (2017)** discovered that nurses do not report many MAEs because they are afraid of the reactions of their nurse managers and peers. Other studies found that not reporting MEs was due to a lack of positive feedback and fear that patients, families, or physicians would develop a negative attitude toward the nurses (**Vrbnjak**

et al., 2016). Time constraints were another barrier to medication errors **(Alqubaisi et al., 2016; Yung et al., 2016).** Also, the lack of feedback from reporters or organizations hinders error reporting **(Rashed & Hamdan, 2019).**

Nurses are in a unique position to experience medication errors because they spend so much time doing it and because they are the recipients of a doctor's order, a pharmacist's preparation, and a hospital's medication dispensing system **(Yoost & Crawford, 2016).** The third WHO challenge, launched in 2017, aimed to achieve a global commitment to reduce the severity and prevent medication-related harm by 50% over the next five years. It is critical to identify all barriers to reporting medication errors to achieve this goal **(Donaldson, 2017).**

One of the most important nursing responsibilities in promoting medication safety is reporting MAEs. Nurses, on the other hand, perceive a variety of barriers to MAE reporting, which are influenced by the perceived safety climate and work environment. According to the study of **Ferrah et al., (2017)** there are between 16% and 27% of nurses have MEs. These results are concerning, and nurses who alert the medical system to MAEs will help to strengthen root cause analysis. Science nurses are the final line of defense in the drug administration chain of events and the last line of defense for patient safety, they are required to report MEs(**Wondmieneh et al., 2020).** Finally, Multiple organizational and individual barriers impede nurses' ability to report MAEs. As a result, it is crucial to develop strategies for enhancing the quality of care and interventions, raising CCN awareness and understanding of the causes of MAEs as well as potential barriers to reporting these errors. This can help nursing managers increase safety, decrease the additional cost, and increase the effectiveness of their care.

Aim

This study aimed to explore the causes of medication administration errors and barriers to reporting from critical care nurses' point of view

Research questions:

1. What are the points of view of nurses about the common causes of medication administration errors?
2. What are the points of view of nurses about barriers of medication administration errors reporting?

Design

A descriptive research design

Setting

Three ICUs affiliated with Mansoura and Tanta Emergency Hospital.

Participants

The current study included a sample of 60 critical care nurses with at least six months of experience in the ICU and provides direct patient care in the previously mentioned settings.

Data Collection Tool

Tool: A structured interview Medication Administration Errors Causes and Barriers Assessment. it consisted of three parts

- Part I: Nurses' Socio-Demographic Characteristics: included nurses' age, gender, level of education, number of years of ICU experience, and previous participation in training programs for medication administration.

- Part II: Causes of Medication Errors: this part was developed by researcher after reviewing of the related literatures. It included seven items and nurses were asked to rank a list of seven potential causes for medication errors, with cause number one being the most common and number seven being the least common cause of MAEs.

- Part III: Barriers of MAEs reporting: It was adapted from **Bahadori et al. (2013)** and used to evaluate barriers to reporting of MEs. It consisted of 19 questions in 3 domains: fear of

reporting consequences (10 items), managerial factors (4 items), and barriers related to the reporting process (with 4 items). The Likert scale with five points was used, with values ranging from 5 for strongly agree to 1 for strongly disagree, where 1 denotes strongly disagree and 2 for disagree. Uncertainty is denoted by 3, agreement by 4, and strong agreement by 5.

Validity of the tool:

The study tool was reviewed by a panel of five experts in medical-surgical and critical care nursing.

Reliability of the tool:

The reliability of the tool's internal consistency was tested and re-tested through Cronbach Alpha based and it was 0.949

Pilot Study

Before gathering data, 10% of the study subjects (six nurses) were piloted to assess the tools' applicability and viability and make any necessary modifications before conducting the main study. Moreover, the pilot study estimated the required time needed for completing the questionnaire.

Ethical Considerations

-After describing the purpose and nature of the study, the hospital administrative authority granted their approval.

- Approval of ethical committee was obtained from the Faculty of Nursing to conduct the study with code (94 9 2022).

The CCNs of the participants were given the assurance that their participation was completely voluntary and that they could leave the study at any time without penalty. The qualified nurses who agreed to participate in the study provided informed consent. Each participant received information about the objectives, advantages, and design of the study. Finally, participants were given the assurance that their data would not be used in another study without their consent or have an impact on their annual evaluation.

Field Work

Preparatory phase

In this phase, the researcher reviewed pertinent literature of the current and past evidence related to various aspects of causes and barriers of medication administration errors using textbooks, magazines and scientific journals. The researcher prepared the collection tools; they were reviewed by experts from different branches and then piloted.

Implementation phase:

From January to May 2021, data were collected during morning and evening shift and according to the CCNs' predetermined schedule. Once the necessary approval was obtained to conduct the proposed study, the researcher conducted a 10-15 minute interview with each nurse who agreed to participate to complete part I of the tool. The questionnaire took between 20 and 30 minutes to complete. The researcher then double-checked each questionnaire item to ensure that no data was missing.

Result:

Table 1 shows that more than half of the nurses who participated in the study were in age between 25-35 years old with a mean age of 31.61 ± 2.038. Two-thirds of them were married, and three-quarters of them were female. A bachelor's degree was held by 50% of nurses. More than half of the nurses had experienced between five and ten years. all nurses didn't participated in medication administration training sessions or workshops.

Table 2 clarifies that the highest possible causes of MAEs were a heavy workload (93.33%) followed by personnel negligence (91.6%). While the lowest possible cause of MAEs was unfamiliarity with medication (40.0%).

Table 3 clarifies that the majority of the studied nurses strongly agree about the fear of producing side effects to patients (95%), expressing a negative attitude towards the nurses making errors (85%), and the impact of reporting on personal annual evaluation and their salary (80%) as a barrier to reporting medication administration error. While

41.66% of them strongly agree about the fear of telling colleagues in other units and facilities about one's medication error.

Table 4 shows that 35.0% of the studied nurses strongly agree that MAEs are not important enough to be reported and had an unclear definition of MAEs

According to **Table 5**, 41.66% of the nurses who participated in the study strongly agree that the common causes of administrative barriers to reporting MAEs are false beliefs about nursing heads and managers and a lack of receiving positive feedback from nursing heads after reporting MEs.

Table 6 illustrates that fear factors were perceived as the highest barriers to reporting MAEs (total score = 44.2±4.9), followed by administrative barriers (18.76 ±3.1), and the lowest barrier was reporting process with a total mean score of 17.30 ± 3.8. The total score of barriers was 82.203±4.1.

Table 7 clarifies that there is a statistically significant correlation between the process of reporting factor and marital status and level of education (P = 0.009*,0.007* respectively) the highest mean ± SD was found in male nurses (47.29 ± 2.14).

Table 1. Socio-demographic Characteristics of Nurses (no. =60)

Socio-demographic characteristics	No. = 60	%
Age		
▪ > 25	16	26.7
▪ (25-35)	34	56.7
▪ < 35	10	16.6
Rang	(22-40)	
Mean ± SD	31.61 ± 2.038	
Gender		
▪ Male	15	25.0
▪ Female	45	75.0
Marital Status		
▪ Single	17	28.3
▪ Married	40	66.7
▪ Divorced	3	5.0
Level of education		
▪ Nursing school	14	23.3
▪ Institutes of nursing	16	26.7
▪ Bachelor of nursing	30	50.0
Years of working experience in ICU		
▪ <5	9	15.0
▪ 5 to 10	40	66.7
▪ >10	11	18.3
Attending training programs/ workshops		
▪ No	60	100.0

Table 2: Frequency Distribution of the Causes of MAEs as Reported by the Studied Nurses (n=60).

Ranking	# Causes of medication errors	No.	%
1	Heavy workload	56	93.33
2	Personnel neglect	55	91.6
3	Insufficient training	52	86.6
4	Complicated prescription	51	85.0
5	New staff	48	80.0
6	Unfamiliarity with patient	39	65
7	Unfamiliarity with medication	24	40.0

More than one answer was chosen

Table 3: Fear factors barrier among the studied nurses (n=60)

Fear Factors	The studied nurses (n=60)									
	Disagree		Strongly disagree		Uncertain		Agree		Strongly agree	
	N	%	N	%	N	%	N	%	N	%
Fear of consequences producing side effects to patients.	0	0.0	0	0.0	2	3.3	1	1.7	57	95.0
Recognized as incompetent nurses and inadequacy.	0	0.0	1	1.7	1	1.7	30	50.0	28	46.6
Being blamed by nursing heads.	0	0.0	1	1.7	3	5.0	20	33.3	36	60.0
Being blamed by doctors.	0	0.0	2	3.3	1	1.7	17	28.3	40	66.7
Being blamed by colleagues.	1	1.7	1	1.7	3	5.0	17	28.3	39	65.00
The impact of reporting errors on the personal annual evaluation	0	0.0	2	3.3	0	0.00	10	16.6	48	80.0
The impact of reporting on their salary and benefits.	0	0.0	2	3.3	0	0.0	10	16.6	48	80.0
Expressing a negative attitude towards the nurse(s) making errors.	0	0.0	1	1.7	3	5.0	5	8.3	51	85
Judicial issues following reporting on medication errors.	2	3.3	4	6.7	2	3.3	5	8.3	47	78.3
Telling coworkers in other facilities and units about one's medication error	10	16.66	14	23.33	8	13.33	3	5.0	25	41.66

Table 4: Reporting process barrier among the studied nurses (n=60)

Reporting process	The studied nurses (n=60)									
	Disagree		Strongly disagree		Uncertain		Agree		Strongly agree	
	N	%	N	%	N	%	N	%	N	%
Forget reporting MAEs	15	25.0	12	20.0	12	20.0	1	1.7	20	33.3
Unclear definition of MAEs	3	5.0	24	40.0	9	15.0	3	5.0	21	35.0
Think MAEs not important enough to be reported.	1	1.7	30	50.0	3	5.0	5	8.3	21	35.0
Too much time for contacting instructors.	5	8.3	30	50.0	1	1.7	15	25.0	9	15.0

Table 5: Administrative barrier among the studied nurses (n=60)

Administrative barrier	The studied nurses (n=60)									
	Disagree		Strongly disagree		Uncertain		Agree		Strongly agree	
	N	%	N	%	N	%	N	%	N	%
Lack of encouragement from the nursing directors after reports of MEs	3	5.0	8	13.3	10	16.6	14	23.3	25	41.66
False beliefs in nursing heads and managers.	3	5.0	8	13.3	10	16.6	14	23.3	25	41.66
Instructors' responses to MAEs don't match the severity of the errors	1	1.7	5	8.3	8	13.3	17	28.3	19	31.6
Misappropriate reactions of the heads to the error's importance.	1	1.7	1	1.7	16	26.6	15	25.0	17	28.3

Table 6: Total Mean Scores of the Barriers Dimensions

Barriers dimensions	The studied nurses (n=60)					
	No Items	Min	Max	Mean ± SD	Mean %	Ranking
A. Fear Factors	10	10	50	48.31 ±3.07	96.62	1
B. Reporting process	4	4	18	17.30±3.8	86.50	3
C. Administrative barrier	4	4	20	18.76 ±3.1	93.80	2
Total score of barriers	**18**	**18**	**90**	**82.203±4.1**		

Table 7: correlations between barriers to reporting medication errors and socio-demographic data of studied nurse

Item	Barriers to reporting medication errors n=60		
	Fear factor	**Administrative factor**	**Reporting process factor**
Gender			
Male	47.29 ± 2.14	17.00 ± 4.5	16.43 ± 3.21
Female	43.70 ± 5.11	15.19 ± 3.77	17.81 ±3.15
T-test	1.820	0.515	0.300
P-value	0.075	1.474	0.766
Marital-status			
Married	44.00 ± 5.38	17.16 ± 3.89	16.16 ± 3.01
Single	44.82 ± 3.03	17.73 ± 4.20	17.18 ± 1.99
Divorced	44.50 ± 7.78	18.50 ± 0.71	17.50 ± 4.95
F-test	0.115	0.091	5.284
P-value	0.891	0.913	0.009*
Level of education			
Diploma	43.33 ± 5.96	18.67 ± 2.10	16.33 ± 4.12
Institute	43.45 ± 4.48	17.27 ± 4.84	16.45 ± 2.30
Bachelor	44.89 ± 4.73	18.11 ± 3.95	17.48 ± 2.81
F-test	0.107	0.0581	5.29
P-value	0. 961	0.913	0.007*

Discussion

Due to error frequency and potential patient risk, medication administration errors are frequently used in hospitals especially ICU as an indicator of patient safety (**Khalifa, & Farghally, 2020**). A patient in a hospital experiences one ME each day, most frequently when taking the medication. (**Durham et al., 2016**). These errors are common and will be a long-term problem in the healthcare system (**Manias et al., 2019**).

As regards the socio-demographic characteristics of the studied nurses, the current study found that more than half of the participants nurses were female, aged 25 to 35 years old. This can be explained by traditional nursing working styles and job descriptions that require young nurses to deal directly with patients, and as they grow older, they will be responsible for managerial duties. Furthermore, the majority of nurses in Egypt are female, and their numbers in nursing fields have remained higher than males for the past ten years. Nursing is a naturally feminine activity, and women have traditionally dominated this profession. This finding was consistent with the findings of **Ragheb and Metwally (2016),** who discovered that three-quarters of the nurses they studied were females under the age of 30. This finding was also consistent with an Egyptian study by **Abusaad and Etawy (2015),** which examined

MAEs at a university hospital from the perspective of nurses and discovered that the majority of nursing staff were female, with more than half being between the ages of 25 and 35. In the same vein, the previously mentioned study by **Khalifa and Farghally (2020)** found that female nurses made up the majority of the study sampling. However, **Samsiah, et al., (2020)** discovered that half of their participants were between the ages of 25 and 34, with the majority of them being female. On the other hand, **Abukhader, (2020)** in his study about the effect of medication safety educational programs on nurses' knowledge regarding MEs, found that more than half of the studied samples were male.

Regarding the educational level, the current study found that the majority of the nurses studied had a bachelor's degree in nursing. This could be due to a national trend of placing newly graduated nursing students in intensive care units to improve the quality of care provided to critically ill patients. Indeed, ICU nurses must be well-prepared and highly qualified to provide the best possible care to patients. In contrast, **Samundeeswari and Muthamilselvi (2018)** study found that nurses with a diploma and those with an undergraduate degree had equal distributions of educational background

As regards attending training programs regarding medication administration, the results showed that all of the studied nurses did not attend any training programs, workshops, or scientific conferences regarding medication administration. This finding could be attributed to a lack of in-service training programs, lack of training funds, a high workload for nurses, and a nursing staff shortage, which prevents them from attending training programs. Healthcare institutions must fund in-service education and training for nurses to improve their knowledge and practice and, as a result, the quality of care provided to critically ill patients. **Eltaybani, et al., (2019)** stated that no competence or professional development activities were done before the time of the medications error, and lack of training was involved in only 17% of the reported errors and they added that the training deficiencies appeared due to the high workload over nurses, undue time pressure or inappropriate perception of hazards.

This outcome was in line with **Sulosaari et al.,, (2015),** which confirmed that education and training are key factors in the timely, competent, and safe administration of medication. Nurses must participate in the required training to keep their technical knowledge and knowledge of medication administration up to date. Among care providers, nurses are considered gatekeepers in

reducing the risk of medication errors and can detect errors more than any other healthcare providers due to their direct patient care routine activities and responsibility in the administration of medication to patients **(Geravandi, et al., 2016).**

As regards to causes of MAEs, the current study showed that the studied nurses believed that the three most frequent reasons for MAEs were a heavy workload followed by personnel neglect then insufficient training. This finding agreed with **Abusaad and Etawy (2015),** who revealed that the lowest cause of MAEs was unfamiliarity with medication and the highest possible causes of MEs were nurses' heavy workloads followed by personal neglect.

While **Tariq, et al., (2020)** clarified that the major causes of MAEs are distraction, distortions, and illegible writing. Also, **Alrabadi et al., (2020)** reported that the main causes were setting the infusion device incorrectly, distraction by other patients, coworkers, or any event, labeling, and packaging problems.

The statistical analysis of the studied nurses ' barriers to MAEs reporting showed that the strongest perceived barriers to reporting were fear of consequences (producing side effects on patients, expressing a negative attitude toward the nurse, and the impact of reporting on their salary and

benefits) followed by barriers of the reporting process as too much time for contacting instructors, and forgetting to report the MEs. However fear of these negative consequences may lead the nurses to report errors if errors cause patient harm.

In this regard, **Dirik, et al., (2019)** showed that the majority of nurses reported that "afraid/hesitant to be seen as incompetent by peers" was a reason for not reporting MEs followed by "afraid/hesitant of being punished by managers" and "unaware a mistake has been made". Also, a study by **Rutledge, et al., (2018)** reported that the highest barriers were the time-consuming nature of reporting processes and fear of repercussions. This may be due to different organizational processes and punishment rules.

Interestingly, nurses consistently believe that reporting MEs is the accurate entity to do, but in their practice, most of them rarely report such errors if occurred (**Peyrovi, et al., 2016**). A study conducted in the United States (US) showed inadequate time or the perception that reporting MEs is too much time-consuming (**Rutledge, et al., , 2018**).

The findings of the study done by **Lee (2017)** revealed that nurses do not report many MAEs because they fear the reactions of their nurse managers and peers. In another study, the reasons for not reporting MEs included a lack of positive feedback, as well as the concern that patients and families or the physician might develop a negative attitude toward the nurses (**Vrbnjak, et al., 2016**). In addition, the study showed that more than one-third of the studied nurses strongly agree that MAEs are not important enough to be reported and had an unclear definition of MAEs. This finding was supported by **Mourd, et al., (2020)** who revealed that the lowest mean score was a lack of education about reporting medication errors. This emphasized the importance of in-service training programs for nurses about reporting medication administration errors.

Concerning administrative barriers among the studied nurses, the present finding stated that less than half of the studied nurses strongly agree that the Lack of receiving positive feedback from the nursing heads following of reporting of MEs and false beliefs in nursing heads and managers are the common causes of administrative barriers to reporting MAEs. This result agreed with **Abukhader, (2020)** who revealed that participant nurses declared that the incidents of MAEs are underreported; they believed that it was most likely due to the fear of losing their job, or punishment from head nurses or managers. Therefore the hospital managers or head nurses should introduce reward systems, and improve incident reporting systems by including a variety of reporting channels and

creating a strong safety culture within the hospital.

The current result concluded that fear factors were perceived as the highest barriers to reporting MAEs followed by administrative barriers and the lowest barrier was reporting process. This finding supported by **Nkurunziza, et al., (2018)** showed that administrative and fear barriers were the top two reasons for not reporting medication errors. So the managers must demonstrate positive responses to nurses for reporting medication errors to improve patient safety.

Moreover, the Malaysian study by **Samsiah, et al., (2016)** reported that a managerial focus on the nurses and their practice prevented them from reporting MEs, but the same study also showed that MEs that were deemed serious were more likely to be reported compared to errors that were perceived as harmless. However, some of the participants in the study by **Alamrani, (2020)** reported that they valued patient safety, and hence were not afraid of any punitive measures and punishments should they report MEs, although this could be due to social desirability bias in nurses' responses, as the study used personal, face-to-face interviews.

As regards the correlations between barriers to reporting medication errors and socio-demographic data of studied nurses, the current result showed that there is a statistically significant correlation between the process of reporting factor and marital status and level of education. This indicated that most of the studied nurses had bachelor's degree and they studied the importance of reporting incidents in the nursing curriculum. In contrast, **Mourd, et al., (2020)** showed that there was no statistically significant relationship between all personal data of the studied sample and their perception of total incident reporting barriers.

Finally, it should be mentioned that minimizing the time between errors and their report should also be regarded as a crucial issue. Studies indicate that MEs are one of the major issues facing the health care system, and even more crucially, ME prevention depends on accurate reporting **(Soori, et al., 2019).** Also, nurses must report MEs because they are the final safeguard for patients' wellness and the last safety check in the chain of events during the drug delivery procedure **(Wondmieneh et al., 2020).**

Conclusion

Heavy workload followed by personnel negligence was the most common causes of MAEs. Fear factors were perceived as the highest barriers to reporting MAEs while the reporting process was the lowest barrier to reporting from the nurses' point of view

Recommendations

- Replication of this study on a large

probability sample

- Continuous and effective education programs should be provided for all nurses to enhance their knowledge about MAEs

- Open feedback systems are required for motivating nurses to report medication errors.

- Close monitoring and supervision of nurses to ensure patient safety during medication administration.

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