

## Nurses' Perceptions of Safety Climate and Barriers to Report Medication Errors

Ebtsam Aly Abou Hashish and Gehan Galal El-Bialy

Nursing Administration Department, Faculty of Nursing, Alexandria University. Alexandria, Egypt  
[ebtsam\\_ss@hotmail.com](mailto:ebtsam_ss@hotmail.com)

**Abstract:** Patient safety issues, including safety climate and medication safety, are central concerns for the nursing profession and nurses' job responsibility. Creating an environment conducive to reporting errors requires and related to a systems approach to patient safety and safety climate. Therefore, this study aimed to assess nurses' perceptions of safety climate and barriers to report medication errors. The study conducted at all in-patient medical and surgical care units at Alexandria Main University Hospital. A random sample of (50%) staff nurses (N = 204) who working in the previous units were included. Safety Climate Scale (SCS) was used to measure nurses' perceptions of safety climate. Barriers to Reporting Medication Administration Errors Questionnaire (BRMAE-Q) was used to measure nurses' perceptions of barriers to report medication errors. Nurses perceived high safety climate in their units and perceived that the most barriers that hinder them to report medication errors are "Disagreement over what is medication error and its definition, and power distance". While, reporting effort is the least barrier to report medication errors. Also, there was a positive significant correlation between nurses' perception of overall safety climate and perceived barriers to report medication errors. Nurses might perceive that safe work climate could be related to their unreporting of medication errors. Continuous in-service educational programs on quality and safety including safe work environment and safe climate as well as a blame-free culture for reporting errors are recommended.

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### 1. Introduction

Generally speaking, creating a culture of safety is thought to be an important prerequisite in ensuring that patients receive the safest possible care. Healthcare organizations are therefore encouraged to improve safety culture and climate as part of an overall drive to improve patient safety.<sup>(1)</sup> For nurses, safety climate is defined as the shared perception of nurses regarding the protection of patients from medication errors and injuries resulting from health care intervention and environment.<sup>(2,3)</sup>

Blegen *et al.*, (2005) clarified components of safety climate such as; **unit manager's role** emphasizing management commitment, support for safety programs and safety-related feedback from managers, **safety emphasis** revealing patient safety as top priority throughout the organization, **socialization and training** emphasizing communication among staff members, safety-related training and training on technology, **blame system** and non punitive reporting of errors, **pharmacists role** toward safety, **use data for improvement** emphasizing learning from errors through information and reported data, and, **worker safety** issues including provision of personal protective equipments, safety procedures and precaution programs and safe work place design.<sup>(3)</sup>

The American Nurses Association (ANA, 2001) reported that nurses' perceptions of the safety climate and nurses' perspectives in health care are critical information that must be available when analysis, discussion and changes are considered in relation to patient safety efforts and medical errors management.<sup>(4)</sup> As a matter of fact, nurses comprise the largest component of the health care workforce, and they are involved in provision, management, research and education related to patient safety and error reduction in health care.<sup>(5,6)</sup> Therefore, nurses are responsible for the safety of their patients. One area of patient safety to consider is medication use, specifically medication management processes and medication administration safety.<sup>(7)</sup>

Medication management processes involves five main stages namely: prescribing, ordering, dispensing, distributing and administration.<sup>(8)</sup> Medication administration, include giving medication, management and reporting of medication errors, identified as a priority area for quality improvement.<sup>(9)</sup> In fact, medication administration is an integral part of nurses' duties, consuming up to 40% of their time.<sup>(10)</sup> This role is considered a high risk procedure, as it requires high level of concentration and skills.<sup>(8,10)</sup>

Medication Administration Errors (MAE's) are often used as indicators of patient safety in hospitals because of their common occurrence and potential risk

to patients. A study done by Bar-Oz *et al.* (2008) had reported that approximately one third of adverse drug events is associated with medication errors that are viewed as preventable.<sup>(11)</sup> A Medication error is defined as “any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the healthcare professional, patient, or consumer”. Such event may be related to professional practice, healthcare products, procedures, and systems.<sup>(12, 13)</sup>

Obviously reporting is fundamental to the broad goal of medication error reduction. Underreporting of medication errors is a significant problem among nurses. Many barriers were identified that could weaken nurses’ willingness to report errors and diminishes the opportunity to learn from these errors.<sup>(6)</sup> For these reasons, barriers to report medication errors must be explored from nurses’ perceptions in their units.<sup>(2,3)</sup>

Wakefield *et al.*, (2004,1996) categorized barriers to report medication errors as *fear* of punishment of causing and reporting medication errors, *disagreement over what is medication error* and its clear definition, *administrative responses* to errors, *reporting effort* including time and procedure to report error, *face-saving* and maintaining a positive image of coworkers to avoid interpersonal conflict and *power distance* between managers and subordinates.<sup>(14,15)</sup>

Creating an environment conducive to reporting errors requires a system approach to promote patient safety. An optimal error reporting system with voluntary and blame-free features can provide abundant information for learning about medication errors and managing medical errors comprehensively.<sup>(2)</sup> Thus, a health care organization featuring safety commitment and decrease punishment should encourage nurses to report errors and mitigate barriers to report medication administration errors.<sup>(2, 4, 15)</sup>

In Egypt, up to the knowledge of current researchers, there is no statistical data regarding the incidence of medication errors. However, few studies have focused only on the assessment of the occurrence and reasons of nursing medication errors, assessment of safety culture and developing manual for safety measures.<sup>(16-21)</sup> These studies recommended further studies to determine and investigate the causes of medication errors and barrier of reporting these errors in order to help in their prevention in the future and improve patient safety and safety climate in work place.

Different studies were conducted in U.S.A and European countries investigated nurses’ perception of safety climate and medication errors<sup>(2,3,8,10-15,22-24)</sup> These studies found a relationship between incidence of medication errors and safety climate in hospital setting and recommended further studies to identify the causes

that hinder nurses to report the medication errors which could affect patients’ safety.

Yet, little is known about how safety climate can contribute to the elimination of barriers to medication administration errors reporting from nurses’ perspectives.<sup>(2,3,15)</sup> Analysis of medication errors and barriers to reporting these errors can lead to system improvement and reduce risk only if the errors are detected, reported, and used to design better patient-care practices and systems.

Likewise, the way in which safety climate is linked to nurses’ perceptions of medication administration errors reporting requires more research. It is hoped that the findings of such study will emphasize the role of nurses in promoting safety climate for patients in relation to preventing medication errors through the reporting approach.

**Aim of the study:** this study aims to assess nurses’ perception of safety climate and barriers to report medication errors at Alexandria Main University Hospital.

#### **Research questions:**

- How do nurses perceive safety climate in their units?
- What are the barriers nurses perceive to report medication errors in their working units?
- What is the relationship between nurses’ perception of safety climate in their working units and barriers to report medication errors?

## **2.- Materials and Method:**

### **Materials:**

**a- Research design:** A descriptive correlational design was used to conduct this study.

### **b-Setting:**

The study was conducted at all in-patient medical and surgical care units at Alexandria Main University Hospital (N=37).

### **c-Subjects:**

A random sample of 50% staff nurses (N = 204) working at in-patient care units and willing to participate in the study was included.

### **d- Tools:**

Two tools were used for this study namely;

**1- Safety Climate Scale (SCS)** was developed by Blegen *et al.*,<sup>(3)</sup> to measure nurses’ perceptions of safety climate regarding medication and patient safety. This scale consists of 33 items covering seven safety dimensions namely; unit manager role (5 items), safety emphasis (5 items), socialization and training (6 items), blame system (5 items), pharmacists role (3 items), use data for improvement and reporting (4 items), and worker safety (5 items). Responses were rated on 5-point likert scale ranging from "5" strongly agree to "1" strongly disagree.

**2- Barriers to Reporting Medication Administration Errors Questionnaire (BRMAE)**, it was developed by Wakefield *et al.*,<sup>(14)</sup> to measure nurses' perceptions of barriers to reporting medication errors. This questionnaire consists of 25 items categorized in six subscales namely; Fear (5 items), disagreement over medication error (4 items), administrative responses (4 items), reporting effort (2 items), face-saving (4 items), and power distance (5 items). Responses were rated on 5-point likert scale ranging from "5" strongly agree to "1" strongly disagree. In addition, one open ended question was used to identify other reporting barriers from nurses' point of view.

A Data sheet was developed for nurses to elicit information related to; (unit, age, education, years of experience, marital status and working shift). In addition to two questions about previous experience and reporting of medication errors.

#### Method:

- 1- A written approval was obtained from the administrative authority in the identified setting to collect the necessary data.
- 2- Tools were translated into Arabic and tested for content validity by 5 experts in the field of study. Accordingly, some items were modified.
- 3- Tools were tested for reliability using the Cronbach's alpha coefficient to measure the internal consistency of items. The two tools were reliable (**SCS= 0.79**) and (**BRMAE= 0.832**).
- 4- A pilot study for the questionnaires was conducted on 20 nurses (10%) who were excluded from the study subjects. In the light of the findings of the pilot study, no changes occurred in the tools.
- 5- Data were collected from nurses through the study's tools after obtaining their approval to participate in the study and maintaining the confidentiality of data. Actually data were collected over three months.

#### Statistical analysis:

1- Data were coded by the researchers and statistically analyzed using SPSS version 16.

2- Descriptive statistics:

- Frequency and percentages were used for describing and summarizing qualitative and categorical data.
- Mean (X) and Standard Deviation (SD): were used as measures of central tendency and dispersion respectively for quantitative data.

#### For safety climate If the mean is

- = <2.5 this indicate poor safety climate
- = 2.5 – 3.75 this indicate moderate safety climate
- = > 3.75 this indicate high safety climate

#### For Barriers to Report Medication Errors If the mean is

- = <2.5 this indicate low barriers to Report Medication Errors

= 2.5 – 3.75 this indicate moderate barriers to Report Medication Errors

= > 3.75 this indicate high barriers to Report Medication Errors

3- Inferential statistics:

- ANOVA test (*f*), Student *t* test (*t*) and Pearson Correlation Coefficient (*r*) were used. All tests of significance were done at the 5% level.

#### 3. Results:

**Table 1** shows that 52.9% of nurses work in surgical care units, while 47.1% of them work in medical care unit. About thirty eight (37.7)% of nurses were in age group ranging 30-40 years old, while 12.3% of them were over 50 years old. The majority of nurses (83.8%) had a diploma of Secondary Technical Nursing School, while, 8.3% of them had a Bachelor Degree of Nursing Science. Moreover, the highest percentage of nurses had over ten years of experience in nursing, working in all shifts and were married represented by 67.7%, 49.5% and 73.0%, respectively. Only, 17.2% of nurses had previous experience of medication error and 39.2% of nurses reported medication errors made by themselves or by their colleagues.

**Table 1:** General demographic characteristics of nurses working at in-patient care units at the Main University Hospital (N=204).

Variable	No	%
<b>Working unit</b>		
- Medical	96	47.1
- Surgery	108	52.9
<b>Age (years)</b>		
- <30	57	27.9
- 30 – 40	77	37.7
- 41 – 50	45	22.1
- >50	25	12.3
<b>Educational qualification</b>		
- Bachelor of Nursing Science	17	8.3
- Diploma of Technical Health Institute	16	7.8
- Diploma of Secondary Technical Nursing School	171	83.8
<b>Experience in Nursing</b>		
- <5	20	9.8
- 5 – 10	46	22.5
- > 10	138	67.7
<b>Marital status</b>		
- Single	50	24.5
- Married	149	73.0
- Divorced	5	2.5
<b>Working shift</b>		
- Morning	96	47.1
- Night	7	3.4
- All shift	101	49.5
<b>Previous experience of causing medication errors</b>		
- Yes	35	17.2
- No	169	82.8
<b>Reporting of medication errors done by self or colleagues</b>		
- Yes	80	39.2
- No	124	60.8

**Figure (1)** indicates that the total mean of nurses' perception of overall safety climate in their working units was (3.96). The highest mean score of nurses' perception regarding the different components of safety climate was related to *safety emphasis, using data for improvement, and unit manager's role* ( 4.10, 4.05 and 4.00), respectively. On the other hand, the lowest mean score of nurses' perception was related to *blame system* (3.71).

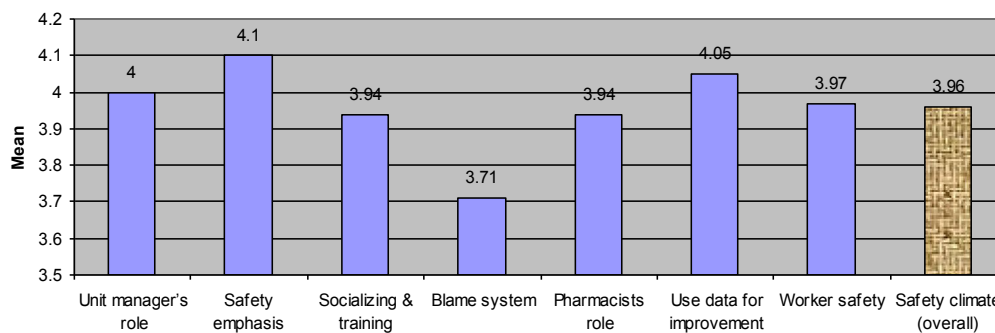
**Figure (2)** illustrates that the total mean of nurses' perceptions of barriers to report medication administration errors in their working units was (3.93). However, the highest means score of nurses' perception regarding the different barriers were related to *Disagreement over what is medication error and its definition* and *power distance* where mean (4.24 and 4.07), respectively. Conversely, the lowest mean of nurses' perception was related to the barrier *reporting effort* represented by (3.65). In contrast, nurses' responses on the open ended question about other barriers to reporting medication errors from their points of view did not add new barriers.

Regarding nurses' experience with medication errors, **Table 2** reveals that there is a significant

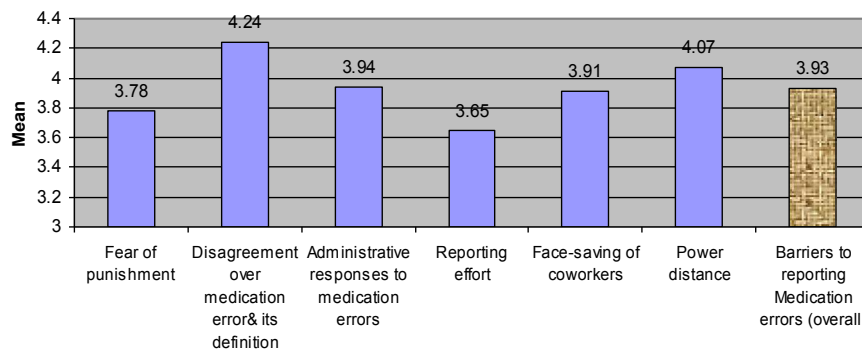
difference between nurses who had previous experience with medication error and those who did not and their perceptions of safety climate where ( $t=3.281, p=0.001$ ). Furthermore, there is a significant difference between nurses who report the medication errors to their head nurses and who did not and their perception of safety climate where ( $t=2.358, p=0.019$ ). Nurses who experienced previous medication errors and reporting these errors perceived safety climate less than those who neither had experience nor reported errors.

**Table 3** shows significant relationships between nurses' perceptions of safety climate and each of the nurses' educational qualification, marital status as well as the type of working shift where  $p=(0.005, 0.001$  and  $0.006$ ) respectively. On the other hand, there is no significant relationship between nurses' socio-demographic characteristics and their perceptions of barriers of reporting medication errors except for working unit where  $p=(0.015)$ .

**Table 4** illustrates that there is a positive significant correlation between nurses' perceptions of overall safety climate and perceived barriers to reporting medication errors where ( $r=0.137, p=0.049$ ).



**Figure (1): Nurses' perception of safety climate at in-patient care units at the Main University Hospital**



**Figure (2): Nurses' perception of barriers to report medication errors at in-patient care units at the Main University Hospital**

**Table (2): Relationship between nurses' experience of medication errors and their perception of safety climate and barriers to report medication errors.**

Variable	Response	Safety climate	Barriers to medication errors reporting
Previous experience of medication errors	Yes	3.92 ± 0.48	3.92 ± 0.50
	No	4.20 ± 0.41	3.95 ± 0.41
	<b>t(p)</b>	<b>3.281* (0.001)</b>	<b>0.313 (0.755)</b>
Reporting of medication errors	Yes	3.87 ± 0.47	3.92 ± 0.50
	No	4.03 ± 0.47	3.95 ± 0.46
	<b>t(p)</b>	<b>2.358* (0.019)</b>	<b>0.431 (0.667)</b>

(t): Student t test \* $p < 0.05$ .**Table (3): Relationship between nurses' demographic characteristics and their perceptions of safety climate and barriers to report medication errors.**

Variable	Safety climate	Barriers to reporting medication errors
<b>Working unit</b>		
- Medical	3.97 ± 0.53	4.02 ± 0.47
- Surgery	3.96 ± 0.43	3.85 ± 0.48
<b>t(p)</b>	<b>0.140 (0.889)</b>	<b>2.450* (0.015)</b>
<b>Age (years)</b>		
- <30	3.93 ± 0.53	3.84 ± 0.53
- 30 – 40	3.99 ± 0.51	3.97 ± 0.44
- 41 – 50	4.02 ± 0.33	3.99 ± 0.45
- >50	3.89 ± 0.47	3.89 ± 0.57
<b>F(p)</b>	<b>0.590 (0.622)</b>	<b>1.051 (0.371)</b>
<b>Educational qualifications</b>		
- Bachelor of Nursing Science	4.23 ± 0.65	4.04 ± 0.51
- Diploma of Technical Health Institute	4.19 ± 0.37	4.01 ± 0.43
- Diploma of Secondary Technical Nursing School	3.92 ± 0.46	3.91 ± 0.48
<b>F(p)</b>	<b>5.514* (0.005)</b>	<b>0.827 (0.439)</b>
<b>Experience in nursing</b>		
- <5	3.92 ± 0.47	3.92 ± 0.48
- 5 – 10	3.83 ± 0.42	3.88 ± 0.51
- > 10	4.01 ± 0.49	3.95 ± 0.48
<b>F(p)</b>	<b>2.534 (0.082)</b>	<b>0.332 (0.718)</b>
<b>Marital status</b>		
- Single	3.70 ± 0.50	3.93 ± 0.51
- Married	4.05 ± 0.43	3.94 ± 0.46
- Divorced	3.89 ± 0.58	3.60 ± 0.79
<b>F(p)</b>	<b>11.076* (&lt;0.001)</b>	<b>1.183 (0.308)</b>
<b>Working shift</b>		
- Morning	4.06 ± 0.44	3.97 ± 0.46
- Night	4.12 ± 0.32	4.22 ± 0.28
- All shifts	3.86 ± 0.50	3.87 ± 0.50
<b>F(p)</b>	<b>5.250* (0.006)</b>	<b>2.357 (0.097)</b>

(t): Student t test (f):ANOVA test \* $p < 0.05$ .**Table (4): Correlation between nurses' perceptions of safety climate and barriers to report medication errors.**

Variable	r	p
Safety climate	0.137	0.049*
Barriers to report Medication errors		

(r) Pearson Correlation Coefficient \* $p < 0.05$ .

#### 4. Discussion:

The findings of the present study revealed that the mean score of safety climate indicated that nurses perceived high safety climate in their units particularly with regard to the components/dimensions such as ; safety emphasis, using data for improvement, and unit manger's role. This result could be attributed to the new and strong trend in health care

setting and educational hospital for quality improvement and the issue of patient safety. Various quality improvement programs at Alexandria Main University Hospital have focused on safety especially infection control measure. Moreover, there were many initiatives calling for teaching nurses about these issues. This goes in the same line with Chiang (2005) who found that nurses had a positive regard toward safety climate in their hospital and gave the highest agreement to education on quality and safety, and the head nurse role with major emphasis on safety for patient and workers.<sup>(2)</sup> In this respect, Hus and Lin (2002) stated that it is important to provide continuous in-service educational programs on quality and safety which are required for nurses in order to maintain safe work environment as well as for their clinical ladder. Improving knowledge about medications through



orientation and training program especially for newly hired nurses is essential for emphasizing the safety climate in work place.<sup>(25)</sup>

On the other hand, nurses gave the lowest mean score to the "blame system" in the safety climate components. This could be attributed to the fact that it is possible that a blameless reporting culture is still underdeveloped in the hospital of the study. Health care professionals especially physicians as well as nurse managers tend to judge nurses' performance depending on reporting any error to them. Nurses could fear from and avoid being blamed for making any error for the patient. This goes in the same line with Duthie (2005) who stated that reporting errors reflected so badly on nurses that nurses did not like to report any error especially to their managers and physician to avoid blame.<sup>(26)</sup> In this respect, Hartnell *et al.*, (2006) recommended that hospital and nurse managers must demonstrate positive responses to staff members for reporting medication errors and adhere to a quality management program that is perceived by nurses as designed to improve patient safety rather than discover mistakes. Nurses must be involved and believe in this process.<sup>(23)</sup>

The finding of the present study revealed that nurses perceived high barriers to report medication errors particularly with regard the barriers of "disagreement over what is medication error and its definition and power distance" as the most perceived barriers faced them to report medication error. This could be explained as nurses may not clearly recognize the actual meaning of what is medication error and they fear to ask about it as well as fear of reporting any error because the unexpected responses of their administrators. Fear of being blamed and fear of administrators' reactions hinder them to report any error. This result is consistent with Coyle (2005) who found that, lack of recognition and understanding of medication errors as well as fear of administrative decision toward who caused medication error were considered among the most barriers that nurses perceived to report medication errors.<sup>(27)</sup> In addition, Mohamed and Gaber (2010) stated that, nurses have limited knowledge and work experience about medication safety and may not recognize high-risk situations of medications.<sup>(28)</sup> For this issue, Elliot (2010) highlighted that, nurses and nurse managers need to be educated on medication errors and clearly defined working expectations. A strong culture of patient safety needs to be in place to allow nurses to learn from errors to focus on changing systems and not place blame on individuals for making errors.<sup>(29)</sup>

Moreover, nurses perceived "reporting effort" among the barriers to report medication errors but the least one. This could be attributed to the complicated reporting process in filling documents about

medication errors and lack of nurses' time to report medication errors in a written form. Nurses at the Main University Hospital still do not apply the use of Incident Report in communication of errors. This could be supported by Chiang (2005) who stated that, nurses may not report medication errors if too much time is needed in reporting and they lacked a well-defined tool or a form for reporting which should be available such as an incident report.<sup>(2)</sup> Furthermore, Ulanimo *et al.*, (2006) found that lack of knowledge about policies, procedures, and unit routine in reporting errors; busy units and insufficient time to report a medication error; nurses' negligence to report; and nurses' attitude, personality, and little compliance were the barriers to reporting medication errors.<sup>(30)</sup> In this respect, Elliot (2010) clarified that, increasing medication error reporting by nurses at the bedside involves a change in culture within organization in terms of learning from medication error and policies and procedures should be specific regarding medication errors reporting.<sup>(29)</sup>

What is more, the present study showed that nurses who had previous experience with medication errors and reporting these errors perceived safety climate less than those who had not. This could be explained as nurses perceived that safety climate and their safe behaviors could be affected by each other. Nurses might perceive that a positive perception of safety climate could promote safe performance of tasks and decrease errors in work place and because they caused previous errors, their perception of safety climate could be negatively affected. This could be supported by Clark *et al.*, (2002) who indicated that, nurses' perception of safety climate correlate with and is affected by error incidence and reporting.<sup>(31)</sup> The finding of this study is consistent with Chiang (2005) who found that nurses who made and recognized medication errors perceived safety climate negative in comparison with those who had no experience and recognition of medication errors.<sup>(2)</sup> Moreover, Duthie (2005) found that nurses in units with high number of years of experience and reporting medication errors lacked a positive perception of safety climate in work.<sup>(26)</sup> In this respect, Flin *et al.*, (2004) stated that, safety climate at hospital and unit level influence employees' safe behaviors and there is a strong correlation between safety climate and medication safety. Unsafe behaviors include medication errors, rule violations and none reporting of medication errors incidents and these behaviors which affect negatively on patient safety and safety climate.<sup>(32)</sup>

In addition, the present study revealed that nurses with Bachelor degree, and who are married and working in night shifts perceived safety climate higher than those with a Diploma degree, single and working in morning shifts. This could be attributed to nurses'

educational level and degree of responsibility that could affect their attitude toward safety climate. Nurses with a Bachelor degree could learn about safety culture in their curricula. Furthermore, married nurses tend to be more mature in the way of acting and dealing with the greater responsibility on their social and clinical status. This could be supported by Blegon *et al.*, (2001) who clarified that, Bachelor degree nurses and nurses with greater responsibility could be well prepared through their educational and clinical career with different activities that equipped them with competencies in different care situations and promote safe quality care. In addition, nurses working in night shifts may not encounter safety problems and error incidence compared with nurses of day shifts who are burdened by high workload.<sup>(33)</sup> This result goes in the same line with Carrico (2001) who found a significant relationship between safety practice and the type of shift. He found that errors are significantly low in night shifts than those in morning shifts and safe work behaviors tend to be higher among bachelor nurses and in night shift nurses than working in morning shift.<sup>(34)</sup> However, Chiang (2005) found that, there is no significant relationship between nurses' perceptions of safety climate and their socio-demographic characteristics.<sup>(2)</sup>

Moreover, the present study revealed that there is no significant relationship between nurses' demographic characteristics and perceived barriers of reporting medication errors except for the working unit. Nurses in medical units perceived greater barriers for reporting medication errors than nurses in surgical units. This could be attributed to the nature of work in these units where medical care units are characterized by large number of patients especially at the hospital of the study and multiple medications that could require high number of medication administration which causes more liability and opportunity to the risk and incidence of medication errors. thus, nurses in medical units might perceive greater barriers for reporting errors. This could be supported by Cullien *et al.*, (1997) who stated that reporting medication errors is attributed to the high number of medications should be administered.<sup>(35)</sup> In addition, Duthie (2006) indicated that, the higher workload and acuity demands create an environment that carries a greater risk of errors and high rate of reporting reflecting these errors.<sup>(26)</sup>

The present study found that there is a positive significant relationship between the overall safety climate and the perceived barriers to report medication errors in the study's units. Nurses might perceive that safe work climate could be related to their unreporting of medication errors. This could be attributed to the previous clarification in this study that the culture of reporting errors still underdeveloped in these units and

that safety climate could be related to the lower incidence of reporting medication errors. In addition, nurses' fear of reporting medication errors made the perception of reporting errors barriers correlated to safety emphasis. This could be supported by Duthie (2005) who stated that, if nurses believe that fewer medication errors or fewer adverse events represent a safety climate, this may create an incentive not to report these errors and this is consistent with the traditional perception that medication errors reflect badly on nurses and would explain the positive relationship between the perceived barriers and low rating of reporting medication errors and unit's safety climate.<sup>(26)</sup> In this respect, Parsons (2000) recommended, creating incentives to reporting errors, indemnity from punishment, root cause analysis of errors with feedback and educating staff about the outcomes of error reporting as among the cultural changes that required to achieve safety climate.<sup>(36)</sup>

However, the finding of this study is inconsistent with Chiang (2005) who found a significant but negative correlation between nurses' perception of the strength of safety climate and the degree of barriers of reporting medication errors. Nurses who have more agreement about safety climate perceived fewer barriers in error reporting.<sup>(2)</sup> Moreover, Gershon *et al.*, (2004) found that units with a positive safety climate are more compliant with reporting medication errors.<sup>(37)</sup>

### Conclusion and Recommendation:

The findings of this study concluded that nurses slightly perceived high safety climate in their units. Furthermore, they perceived "disagreement over what is medication error, power distance" as the most barriers to reporting medication errors. However, reporting effort is the least barrier to report medication errors. In addition, there was a positive significant correlation between nurses' perceptions of overall safety climate and the perceived barriers to report medication errors. Nurses might perceive that safe work climate could be related to their unreporting of medication errors.

### Based on the previous findings the following recommendation are geared toward:

#### 1- Hospital administrators should:

- Put a great emphasis on a strong culture of safety to focus on changing systems toward provision of safe work climate and allowing nurses to learn from errors reporting.
- Provide continuous in-service educational programs on quality and safety which are required for nurses to maintain safe work environment and safety climate.

- Review policies and procedures and methods of documentation for error reporting to encourage staff of all healthcare providers to report medication errors and to support a blame-free culture in the organization.

## 2-Nurse Managers should:

- Provide educational programs for improving and updating nurses' knowledge of medication safety and medication errors to monitor the effectiveness of treatment, and report adverse events.
- Create incentives for nurses to report errors, and demonstrate positive responses for them when reporting medication errors.
- Encourage active involvement of nurses in determining root causes of medication errors and how promptly reporting them and give feedback about the outcomes of error reporting that required for achieving safety climate.

## 3-Further research study to:

- Assess nurses' perceptions of causes of medication errors and barriers to reporting at intensive care units.
- Assess perceptions of patients and health care professionals about factors contributing to medication errors and potential areas for improvement.

## Strengths of the study:

From researchers points of views the strength points of this study are:

- Using standardized measures that could be adapted to Egyptian culture, and the two tools were reliable.
- All study's subject responded on the questionnaires with no refusal rate.
- There is a paucity of research in the area of investigating barriers for reporting medication errors among nurses in Egypt. Thus, this research could make a unique contribution to the literature by providing insight into Egyptian nursing staff perceptions of safety climate and perceived barriers for reporting medication errors.

## Limitations of the study:

- Researchers surveyed nursing staff only and did not include other healthcare professionals, such as pharmacists or physicians, who could also provide valuable perspectives on patients and medications safety.
- This research used nurses' self-report method which might introduce some bias.

## Corresponding author:

Ebtsam Aly Abou Hashish

Nursing Administration Department, Faculty of Nursing, Alexandria University. Alexandria, Egypt.  
[ebtsam\\_ss@hotmail.com](mailto:ebtsam_ss@hotmail.com)

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