

Effect of Instructional Guidelines on Nurses' Perceived Barriers Regarding Medical Errors Disclosure

Eman Abd- Elrahman Mohamed¹, Reham Abdelhamed Abdelmawla Elsaid², Eman A. Fadel³,
Dalia E. Khalil⁴ & Ola Ebrahim Elsherbiny¹

¹ Lecturer of Medical-Surgical Nursing, Faculty of Nursing, Mansoura University, Egypt.

² Assistant Professor of Medical-Surgical Nursing, Faculty of Nursing, Mansoura University, Egypt.

³ Assistant Professor of Woman's Health and Midwifery, Faculty of Nursing, Mansoura University, Egypt.

⁴ Lecturer of Community Health Nursing, Faculty of Nursing, Mansoura University, Egypt.

Abstract

Background: Despite global efforts, medical errors continue to pose a serious challenge to patient safety. Between the need for medical error disclosure as a key tool for error prevention and the fear of disclosures' negative threats, nurses are confronted with challenges and barriers to disclosing and reporting medical errors. **Aim:** The current study aimed to evaluate the effect of instructional guidelines on nurses' perceived barriers regarding medical error disclosure. **Design:** A quasi-experimental design with one group (pretest and posttest) was used. **Setting:** The study was carried out at inpatient departments and outpatient clinics affiliated to Mansoura University Hospital, Egypt. **Subjects:** A purposive sample of 100 nurses with different educational levels were eligible to be enrolled in the study. **Tools:** The researchers using two tools: Nurses' demographic characteristics, and professional data questionnaire, and the barriers to error disclosure assessment tool. **Results:** The results showed that all the studied nurses (100%) were exposed to medical errors and had barriers to disclosing them. Nurses' knowledge and confidence abilities to disclose medical errors were the most significant perceived barriers, with total mean scores of 4.37 ± 0.43 . After implementing instructional guidelines, nurses' perceived barriers regarding medical error disclosure significantly differed ($t = 58.918$ & $p = 0.000$), in which the total mean score of the perceived barriers improved to 2.89 ± 0.33 post-implementing the guidelines compared to 4.24 ± 0.36 pre-implementing the guidelines. **Conclusion:** The current study concluded that empowering the studied nurses by implementing the instructional guidelines had a positive effect on their perceived barriers regarding medical error disclosure. **Recommendations:** Raising nurses awareness regarding medical error disclosure by adding disclosure guidelines to the curricula of educational nursing institutions, in addition to incorporating them into ongoing in-service training programs at different health care settings.

Keywords: *Instructional guidelines, Medical errors disclosure & Nurses' Perceived barriers*

Introduction

Unsafe care or medical errors (MEs) are a growing global public health challenge to patient safety in health care settings. Medical errors are the third-leading cause of death after heart disease and cancer, accounting for more than 400,000 deaths in the United States alone (Aljabari & Kadhim, 2021). The World Health Organization (WHO) estimated that 134 million adverse events resulting from hospital unsafe care in low- and middle-income countries caused approximately 2.6 million deaths annually in addition to the economic burden (WHO, 2021).

The Institute of Medicine (IOM) Committee on Quality of Health Care defined MEs as "the failure of a planned action to be performed as intended or the application of the incorrect plan to accomplish a desired goal" (Samundeeswari & Muthamilselvi, 2018). The typical causes and types of MEs differ from one healthcare setting to another. The common types of MEs are medication administration errors,

diagnosis errors, and surgical errors, in addition to errors that lead to falls and infections. The most often cited causes of MEs are inadequate staffing and workload and a lack of updated knowledge and training (Carver, et al., 2022).

Unfortunately, the harm of MEs not only inflicted patients but also the health care providers involved in errors. The patient is considered the first victim suffering harm, disability, or death, which can reduce public confidence and trust in health-care systems. The second victim is health professionals who are involved in serious events that result in a patient's death or significant harm, confronting long-lasting psychological harm through embedded emotions of shame, guilt, and self-criticism (WHO, 2021).

In this regard, the Professional Codes of Ethics, the National Quality Forum, the Joint Commission, and the IOM call for medical errors disclosure (MED) as a first step in error prevention and a strategy for providing information that can improve the quality

and safety of healthcare (Welsh, et al., 2021). Error disclosure is a process involving open discussions with patients and families about harm caused by healthcare incidents. The disclosure process has well-defined, orderly steps, including an apology or expression of regret, a factual explanation of what happened, a chance for the patient to share their experience, and a clarification of the steps being taken to manage the event and prevent recurrence (Australian Commission on Safety and Quality in Health Care, 2013; Canadian Patient Safety Institute, 2011).

The disclosure process not only targets patients and families but also involves regulatory agencies and institutional committees to prevent such errors in the future (Kaldjian, 2021 & Harrison, et al., 2019). Medical error disclosure maintains the healthcare team's respect, compassion, and dedication to providing high-quality care and ensuring patient safety (Swinfen, et al., 2023 & Ahsani-Estahbanati, et al., 2022).

Nurses have a crucial role in ensuring patient safety when providing direct care by monitoring patients conditions, detecting errors and near misses, and identifying and communicating changes to patients and health care providers to ensure high quality health care. However, recent studies reported that nurses had several perceived barriers to disclosing errors. The most common reported barriers to MED were confidence and knowledge, psychological, institutional, and financial barriers (Swinfen, et al., 2023). Confidence and knowledge barriers include decreased nurses' confidence in their ability to disclose an error, limited understanding of best practices or what constitutes errors, and communication inexperience. Psychological barriers involve fear of disciplinary action and concerns about losing patients' trust and colleagues' support. Institutional barriers include a lack of disclosure training, unsupportive institutional cultures, unclear guidelines, and administrative threats. In addition to fear of penalties for losing jobs and financial support (Mostafa, et al., 2022).

With the identification and quantification of barriers to MED, evidence-based interventions can be created and tested for their effectiveness in eliminating the barriers among those who provide patient care (Aljabari & Kadhim, 2021). In this context, several countries and organizations have created MED guidelines, which were subsequently distributed to different countries to support and guide health care. Disclosure guidelines are guidance intended to support and encourage healthcare organizations, regulations, and policies to improve the practices related to incident management (Australian Commission on Safety and Quality in Health Care,

2013; Canadian Patient Safety Institute, 2011). These guidelines should be incorporated into in-service education and continuous training for healthcare. Moreover, the hospital policy should build a disclosure culture in a supportive environment free from blame or punishment (Swinfen, et al., 2023).

Building a MED culture in a supportive environment free from blame or punishment is the responsibility of health care institutions. Disseminating MED culture between health care providers can improve their attitude and perception regarding MED, relieve feelings of guilt and fear of penalty, improve relationships between physicians and patients, and enhance the overall quality of care, which consistently decreases the rate of medical errors and its economic expenses (Ahsani-Estahbanati, et al., 2022 & Choi, et al., 2019).

Although recent evidence showed that focused training improves trainees' knowledge, skills, and attitudes towards disclosing MEs, nurses' education and training regarding MED is neglected in research and practice (Choi, et al., 2019; Asgarian, et al., & Mohammadbeigi, 2021; Carver, et al., 2022). Since a little is known about MED and in response to the call of the World Health Organization's "Global Patient Safety Action Plan 2021–2030: towards eliminating avoidable harm in health care" (WHO, 2021). Therefore, the current study is intended to be an action for the call of WHO by developing instructional guidelines and evaluating their effects on nurses' perceived barriers regarding medical error disclosure.

Significance of the study

Patient safety and ethical standards are crucial in healthcare settings to ensure optimal quality of care without harm or negative consequences. Medical errors pose a significant threat to patient safety. So, error detection is vital, and its disclosure and reporting are fundamental to prevention. However, the authors discovered from clinical practice and their own previous study on nurses entitled "Barriers to Reporting Medication Administration Errors as Perceived by Nurses Working at Mansoura University Hospital: A Cross-Sectional Study" that nurses who provided 24 h direct bedside care for patients and who are responsible for patient safety were reluctant to disclose MEs and had several conflicts to disclose and report them when they occurred (Elsherbiny, et al., 2020). Therefore, there is a pressing need for the development of educational guidelines and training programs for MED to change nurse perceptions and attitudes and promote a culture of disclosure in health care settings.

Aim of the study

To evaluate the effect of instructional guidelines on nurses' perceived barriers regarding medical error disclosure.

Research hypothesis

H1: Implementing instructional guidelines would positively affect nurses' perceived barriers regarding medical errors disclosure.

Subjects and Method:**Study design:**

A quasi-experimental research design with a one-group pretest-posttest methodology without random allocation was used to evaluate the effects of instructional disclosure guidelines.

Setting of the study:

The study was carried out at inpatient departments and outpatient' clinics: medical, surgical, urology, neurology, orthopedics, and obstetrics and gynaecology affiliated to Mansoura Main University Hospital (MUH).

Sample:

One hundred eligible nurses were chosen using a purposive sampling technique from the previously mentioned setting according to the following criteria:

- **Nurses' inclusion criteria:** all registered nurses with different ages and educational levels of both sexes who provide direct patient care, have at least one year of work experience, and have agreed to participate in this study.
- **Nurses' exclusion criteria:** nurses who were not involved in patients' direct care (head nurses, nurse managers, and supervisors) and who were unable to complete the study.

Sample size calculation:

Sample size was calculated using the T-test sample size formula of the ClinCalc Statistical Software for power analysis calculation, considering the significance level (5%), the test power (80%), the small effect size (0.3), the effect type (Cohen's d), and the primary outcome variable in the study (Welsh, et al., 2018) with the mean and standard deviation (2.44±0.95). So, to the minimum acceptable sample size of 90, an additional 10% was added to accommodate for participants dropping out of the study, resulting in a final sample size of 100 nurses.

Tools for data collection:

The researchers used two tools for data collection, as follows:

Tool I: Nurses' demographic characteristics and professional data:

The researchers developed this tool after an extensive review of the literature to assess nurses' demographic characteristics and professional data, including age, sex, years of working experience, and exposure to

MEs (Mohamed, et al., 2022; Carver, et al., 2022; Najafpour et al., 2021; Choi, et al., 2019).

Tool II: Barriers to Error Disclosure Assessment (BEDA) Tool:

This tool was developed by Welsh and their colleagues (2018) and adapted by researchers to measure the nurses' perceived barriers regarding MED. This tool included 31 items, arranged in three parts as follows:

Part (1): Includes the first four (4) questions to collect data about the studied nurses' level of training regarding MED.

Part (2): It describes the barriers to MED. It consists of fifteen (15) items with three subscales: knowledge and confidence ability barriers (n = 5), institutional barriers (n = 5), and MED process barriers (n = 5).

Part (3): Consists of twelve (12) additional quantitative items of other barriers to disclosing MEs with two subscales: psychological barriers (n = 9) and financial concern barriers (n = 3).

Scoring system

Each item of the first part was coded one for (yes) and zero for (no). For the second part, participants' agreement with each item was rated on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Each item of the third part was rated on a 5-point Likert scale from 1 (not a barrier at all) to 5 (very much a barrier). Items 5, 6, 8, 9, 16, and 17 were reverse coded prior to data analysis.

For the second and third parts, subscale values are calculated by the standard mean; total item scores divided by the number of items in each sub-scale. According to the nurse, a score closer to five in each negative item and sub-scale indicates a greater effect in obstructing error disclosure.

Validity and reliability:

A panel of five professionals with expertise in the fields of Medical-Surgical Nursing, Women's health and Midwifery, Community Health Nursing from the Faculty of Nursing at Mansoura University, and Medical Biostatistics assessed the content validity of the proposed tools for their clarity, relevancy, comprehensiveness, simplicity, and applicability. The researchers translated the final English version of the BEDA tool into Arabic (participants' native language). The back-translation technique was created for the BEDA Tool.

The experts reviewed the Arabic version of the tool. They suggested simplifying some words to be understood and renaming other variables subscale to the process of MD barriers. Moreover, they suggested recruitment item 14 in the institutional barriers' subscale and item 19 in the process barriers subscale. All suggested modifications were done accordingly. Cronbach's alpha coefficient test was used to assess the internal consistency of the study tools; $r = 0.8$,

0.791, and 0.81 for tool II (parts 1, 2, and 3) respectively.

Pilot study:

A pilot study was carried out on ten percent of the studied nurses (n = 10), who were excluded from the study to evaluate the tools' clarity, feasibility, and applicability and to estimate the required time to fill out the study tools. The pilot trial demonstrated the viability, efficacy, and suitability of the study instruments.

Ethical Considerations:

- The researchers obtained ethical approval from the Faculty of Nursing, Mansoura University Research Ethics Committee on the study proposal (**IRP: Ref. No. P.0415**).
- Official written permission to conduct the study was obtained by the researchers from the dean of the Faculty of Nursing at Mansoura University and from responsible authorities at MUH.
- The informed consent of the nurses was obtained during the data collection at their working areas after clarifying and informing them about the nature and purposes of the research.
- The researchers emphasized to the nurses that participation in the study was voluntary, and they had the right to withdraw at any time during the research process without penalty, as well the anonymity and confidentiality responses were absolutely ascertained throughout the whole study. Respect was shown for morals, values, culture, and beliefs.

Study framework:

Data collection covered 5 months, from the end of February, 2023 until the end of July, 2023. Data was collected during morning and afternoon shifts according to the predetermined schedule of the studied nurses. The framework of this study was carried out in four phases, as follows:

Phase 1: Preliminary assessment phase:

The researchers distributed nurses' demographic and professional data questionnaires (Tool I) and BEDA tool (Tool II) to the studied nurses prior to the implementation of instructional guidelines to explore their demographic characteristics and professional data, experience of medical errors, level of training related to MED, etc. The studied nurses filled out the questionnaires within 20–25 minutes.

Phase (2): Planning phase/ development of the instructional guidelines:

The researchers considered the preliminary assessment data regarding nurses' demographic characteristics and professional data, and nurses' perceptions regarding MED barriers, in addition to recent literature in the development of the instructional guidelines in the form of a printed Arabic booklet (**Murphy, et al., 2021; Candidan**

Patient Safety Institute Disclosure Guidelines, 2011).

The educational medical errors disclosure booklet was a simplified handout aimed at improving and developing the studied nurses' knowledge and confidence abilities to disclose errors, decreasing psychological barriers, and encouraging nurses to apply the disclosure process to improve their perceptions towards MED barriers. The booklet content was written in a short list with a tone that encourages the studied nurses to adhere to the instructions. It started with a brief introduction about the importance of MED.

The researchers presented the booklet content into three modules; module (1) presented the definition of MEs, and MED and their purpose, guiding principles, and types of MED. Module (2) presented the frame of the MED process, which outlined the necessary steps (when, where, and how disclosure should take place; what should be disclosed and documented; and who are the disclosing teams?). While module (3) presented the MED process through a quick guide diagram that adapted from the communication and optimal resolution process (CANDOR), it included improvisational methods of communication, empathic communication skills, and how to apologize (**Battles, et al., 2017**). Instructional guidelines sessions were planned to include numbers of sessions, the estimated session time, the session's specific objectives, and the required materials.

The researchers addressed a variety of teaching materials and methods of presenting the instructional guidelines. The researchers applied multimodal teaching methods and materials for health information delivery to the studied nurses, such as interactive presentations, discussion, and brainstorming, colorful handouts, and printed booklets about MED.

Phase (3): Implementation of the instructional guidelines:

For each setting, the researchers applied the instructional guidelines for the studied nurses throughout three sessions for three days, about two hours per day. It was scheduled at a time that was not conflicted with their work. The researchers distributed the booklet at the first session, after the assessment phase, to attract their attention, motivate them, and enable them to review its content when needed. The researchers answered all questions asked by the studied nurses to make them clear on all aspects of the guidelines.

Phase (4): Evaluation of the effectiveness of the instructional guidelines:

At the end of the teaching sessions, the researchers evaluated the effectiveness of the instructional guidelines among the studied nurses using parts (2 and 3) of the BEDA tool.

Statistical/ Data analysis:

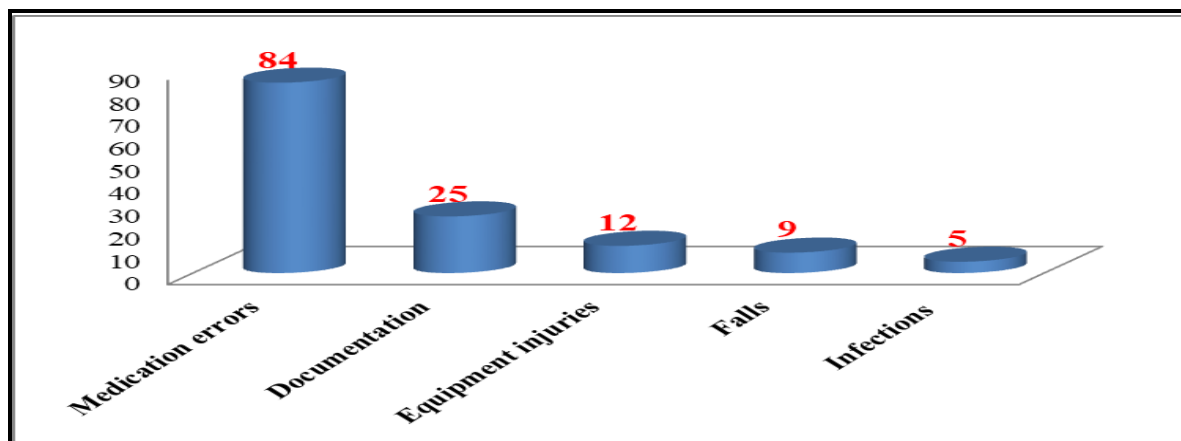
After the data were collected, they were sorted, coded, organized, categorized and transferred into especially designed formats to be appropriate for computer feeding. Statistical analyses were performed using the statistical software Stands for Statistical Package for the Social Sciences (SPSS) v23. Data were presented using descriptive statistics in the form

of frequencies and percentages. Arithmetic mean \pm standard deviation ($M \pm SD$) was used for continuous variables and percentages for categorical variables. T test was used for comparison between 2 paired within one group for quantitative variables. The results were considered not significant if $P > 0.05$ and significant if $P \leq 0.05$.

Results:

Table (1): Percentage distribution of the demographic characteristics and professional data among the studied nurses (N=100)

Nurses' demographic and professional data	N	%
Age in years		
< 40	79	79
\geq 40	21	21
Mean \pmSD	34.4\pm8.13	
Sex		
Male	27	27
Female	73	73
Nursing degree		
Nursing diploma	39	39
Bachelor in nursing	55	55
Postgraduate nursing	6	6
Nursing experience in years		
1- < 5	27	27
\geq 5	73	73
Working area		
Surgical	18	18
Urology	18	18
Orthopedic	18	18
Medical	16	16
Neurology	16	16
Obstetrics and Gynecology	14	14
Medical errors exposure	100	100
Medical errors disclosure	45	45
Barriers to medical errors disclosure in the hospital	100	100



*Nurse is represented by more than one answer

Figure (1): Percentage of the types medical errors among the studied nurses (N=100)

Table (2): Percentage distribution of the studied nurses according to their experience of medical error disclosure and training needs (N=100)

Variables	N	%
Medical errors disclosure training needs among the studied nurses*		
Communication technique (i.e., how, and what to say, and when disclose a ME).	98	98
How to disclose a ME in an empathetic communication.	99	99
How to apologize for a ME.	100	100
Disclosure as an inter-professional team.	100	100
Nurses' experience with medical error disclosure*		
Ever personally disclosed a ME to a patient's family.	11	11
Ever disclosed a ME with healthcare professionals.	44	44

* ME: Medical Error

*Nurse is represented by more than one answer

Table (3): Mean difference in nurses' perceived knowledge and confidence barrier, and the process of medical errors disclosure barrier pre and post implementing instructional guidelines (N = 100)

Items	Pre	Post	Test of significance	P-value*
Knowledge and confidence barrier				
Able to reveal a ME with confidence (-)	2.12 (0.97)	3.61(0.98)	t= 15.374	0.000
Able to accurately reveal a ME (-)	2.03 (0.84)	3.30(1.20)	t= 13.811	0.000
Uncertain about how much should a ME be disclosed	4.72(0.51)	2.55(1.24)	t= 16.752	0.000
Uncertain when a ME should be disclosed	4.66 (0.55)	2.22(0.96)	t= 27.377	0.000
Unsure of my role in a MED conversation with the patient and/or family members	4.62 (0.58)	1.96(0.94)	t= 22.998	0.000
Subscale total mean (SD)	4.37(0.43)	2.36(0.67)	t= 33.973	0.000
Process of medical errors disclosure barrier				
Uncertain about how to disclose a ME	4.76 (0.47)	2.05(1.08)	t= 23.966	0.000
Nurse included in the ME process in the event being involved (-)	2.80 (1.36)	3.23(1.44)	t= 3.774	0.000
Regardless of involvement in the incident, the physician is ultimately accountable for reporting ME (-)	3.26 (1.45)	4.10(0.77)	t= 6.346	0.000
Afraid of being blamed for a ME if not present during the disclosure conversation	4.97(0.17)	4.20(1.47)	t= 5.192	0.000
Other non-physician healthcare providers should be included in the disclosure conversation if they contributed to the occurrence of the error (-)	1.26 (0.96)	4.65(0.50)	t=32.488	0.000
Subscale total mean (SD)	4.08(0.46)	2.45(0.5)	t= 27.682	0.000

t= Paired t-test

P Significance

Significant ($p \leq 0.05$)

(-) Reverse coded

Table (4): Mean difference in nurses' perceived institutional barriers regarding medical error disclosure pre and post implementing instructional guidelines (N = 100)

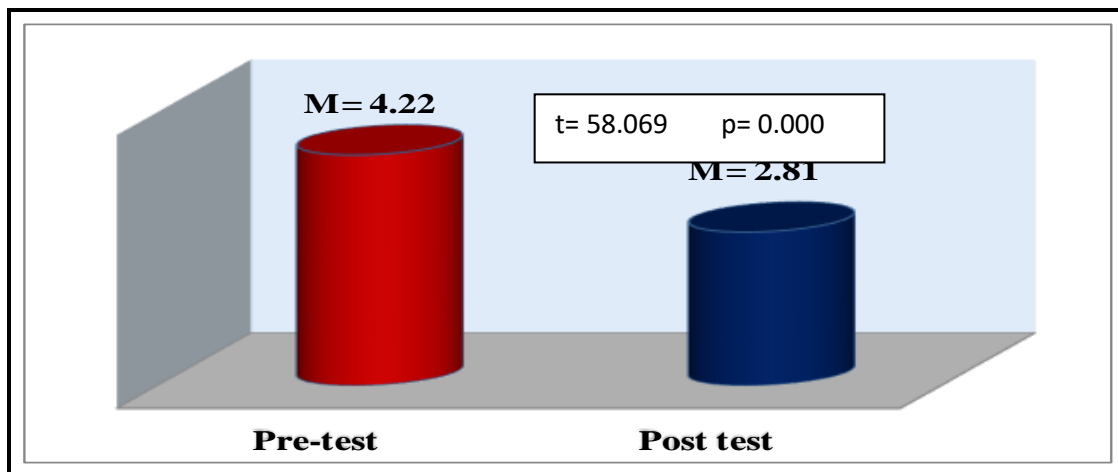
Items	Pre	Post
An atmosphere of transparency is supported in my institution to disclose a ME (-)	1.94(0.78)	1.94(0.78)
Disclosure a ME by health-care providers is supported by my institution	2.06(0.77)	2.06(0.77)
Types of MED are not declared by my institution	3.71(0.78)	3.71(0.78)
Process of MED are not declared by my institution	4.05(0.86)	4.05(0.86)
Peer support services are supported in my institution to deal with the emotional consequences of error	4.74(0.50)	4.74(0.50)
Subscale total mean (SD)	4.1(0.52)	4.1(0.52)

(-) Reverse coded.

Table (5): Mean difference in nurses' perceived psychological and financial barriers regarding medical error disclosure pre and post implementing instructional guidelines (N = 100)

Items	Pre	Post	Test of significance	P-value*
Psychological barriers				
Fear of disciplinary action	4.22(0.83)	2.51(0.87)	t=19.700	0.000
Fear of losing patient trust	4.69(0.61)	2.25(0.97)	t=26.389	0.000
Fear of losing colleague support	4.12(0.92)	2.27(0.92)	t=21.581	0.000
Fear of personal failure	4.35(0.78)	2.03(0.88)	t=26.878	0.000
Fear of losing self-esteem	4.41(0.85)	2.80(0.94)	t=20.717	0.000
Fear of damaged reputation	4.44(0.71)	2.93(0.99)	t=18.088	0.000
Fear of judgment from colleague	4.20(0.88)	2.74(1.07)	t=22.731	0.000
Fear of shame	4.38(0.83)	2.56(0.88)	t=24.931	0.000
Fear that peers will question my competence	4.26(1.05)	2.71(0.99)	t=19.789	0.000
Subscale total mean (SD) scores	4.34(0.62)	2.53(0.53)	t= 44.800	0.000
Financial concern barriers				
Fear of litigation	4.31(0.80)	2.30(0.92)	t= 24.435	0.000
Fear of losing malpractice insurance coverage	4.22(0.91)	2.71(0.97)	t=20.639	0.000
Fear of increased insurance premiums	4.09(1.07)	2.93(1.08)	t=15.229	0.000
Subscale total mean (SD) scores	4.20(0.72)	2.64(0.62)	t= 37.553	0.000

t= Paired t-test P Significance Significant (p≤ 0.05)



t= Paired t-test P Significance (p≤ 0. Significant 05)

Figure (2): Total mean score of the nurses' perceived barriers regarding medical error disclosure pre and post implementing instructional guidelines.

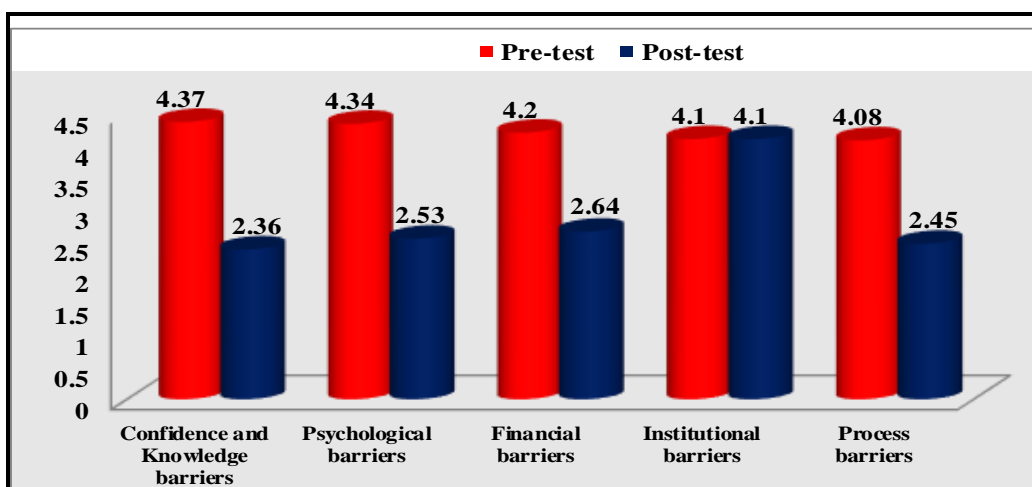


Figure (3): Total mean scores of the perceived barriers subscales regarding medical error disclosure among the studied nurses pre and post implementing instructional guidelines (N=100)

Table (1): Reveals that 79% of the studied nurses were younger than 40 years, with a mean age of 34.4 ± 8.13 . Nearly three-quarters of them (73%) were female and had working experience for five years or more; 55% of them had a bachelor's nursing degree. Additionally, all the studied nurses (100%) were exposed to MEs and had barriers to disclosing them, while only 45% previously disclosed MEs.

Figure (1): Clarifies that, majority of the studied nurses (84%) confirmed that medication administration errors were the most common type of medical errors, followed by documentation errors, equipment injuries, falls, and infection errors (25%, 12%, 9%, and 5%) respectively.

Table (2): Shows that all studied nurses (100%) did not receive any level of training regarding MED, and they praised their need for training on how to apologize regarding errors and disclosing as an inter-professional team. In addition, most of the studied nurses (98% & 99%) needed training concerning disclosure communication technique and how to disclose a medical error in empathetic communication, respectively. Moreover, the results showed that, only 11% of the studied nurses disclosed MEs with a patient or patient's family, while 44% of them disclosed MEs with healthcare professionals.

Table (3): Illustrates that the total mean score of nurses' perceived barriers concerning knowledge and confidence abilities to disclose MEs decreased from 4.37 ± 0.43 pre-implementing the instructional guidelines to 2.36 ± 0.67 post the instructional guidelines, and these differences are observed to be statistically significant ($t = 33.973$ & $p = 0.000$). Moreover, the process of MED was considered a perceived barrier as reported by the studied nurse pre-implementing instructional guidelines with a total subscale mean score 4.08 ± 0.46 , which was significantly differ ($t = 27.682$ & $p = 0.000$) and improved post-implementing with a total mean score 2.45 ± 0.5 .

Table (4): Illustrates that the institutional barrier for MED is the only subscale that did not differ significantly among the studied nurses pre- and post-implementing instructional guidelines with total mean score of 4.1 ± 0.52 .

Table (5): Displays that the total mean scores of nurses' perceived psychological barriers regarding MED subscale significantly decreased from 4.34 ± 0.62 pre-implementing instructional guidelines to 2.53 ± 0.53 post-implementing instructional guidelines. There was a statistically significant difference between pre- and post-implementation of instructional guidelines ($t = 44.800$, $p = 0.000$). Moreover, the total mean scores of nurses perceived financial barriers regarding MED significantly decreased from 4.20 ± 0.72 pre-implementing

instructional guidelines to 2.64 ± 0.62 post-implementing instructional guidelines. There was a statistically significant difference between pre- and post-implementation of instructional guidelines ($t = 37.553$, $p = 0.000$).

Figure (2): Shows that there was a statistically significant difference in the total mean score of nurses' perceived barriers regarding medical error disclosure pre- and post-implementing instructional guidelines ($t = 58.069$, $p = 0.000$). The total mean score of the perceived barriers among the studied nurses decreased to 2.81 ± 0.33 post-implementing instructional guidelines compared to 4.22 ± 0.36 pre-implementing instructional guidelines.

Figure (3): Indicates that pre implementing instructional guidelines the most common perceived barriers to disclosing MEs among the studied nurses was the knowledge and confidence barriers with mean (4.37 ± 0.43) followed by psychological, financial, institutional and process barriers (4.34 ± 0.62 ; 4.20 ± 0.72 ; 4.1 ± 0.52 and 4.08 ± 0.46) respectively.

Discussion:

Although health care providers believe that MEs should be disclosed to patients and their families, they often hesitate and are uncomfortable doing so (Gallagher, et al., 2023). Guidelines for error disclosure have not yet been established in Egypt until now, and a lack of in-service training and empowered educational programs regarding MED negatively affect nurses' willingness to disclose MEs. Since all previously conducted studies in Egypt were descriptive studies, the current study aimed to evaluate the effect of instructional guidelines on nurses' perceived barriers regarding MED.

The current findings revealed that all the studied nurses have been exposed to MEs, and medication administration errors were the most common type of MEs they exposed. This finding could be attributed to the fact that any human work is exposed to error, especially if there are frequently performed procedures with a multistep nature, such as medication administration. This result is supported by Alzoubi, et al., (2023) & Bam, et al., (2021). This similarity can be justified as medication administration and its related issues are among the high-priority responsibilities of nurses. In addition, fatigue, stress, night shifts, increased workload, workflow interruptions, and the nurse staffing ratio are significant predictors of medication errors.

Moreover, the current study found that more than half of the studied nurses have not disclosed MEs, and all of them did not receive any level of MED training. The current study findings may be attributed to the absence of a transparent MED environment and

ignorance about its process in health care settings. The present study finding is in agreement with several studies conducted by **Hamed & Konstantinidis (2022)**; **Khammarnia, et al., (2021)**; **Ahmed, et al., (2019)**, who stated that inadequate education and training and miscommunication by healthcare workers have led to many adverse effects of negligence of MED. Accordingly, the previous studies done by **Ranaei, et al., (2020)** reported that there is an urge for educational interventions to improve MED.

Going with this context, the current results revealed that the nurses' knowledge and confidence in their abilities to disclose medical errors were the most significant barriers to disclosing MEs before implementing instructional guidelines. This study finding may be attributed to a lack of previous training, educational insufficiency, limited professional development, and limited professional interactions. While following post-instructional guidelines, nurses' perceptions regarding their knowledge and confidence abilities to disclose MEs were positively improved.

The present study finding is supported by a study conducted by **Irani, et al., (2023)**, who revealed that nurses hesitated to provide full MED and needed continuous education and support. In the same direction, the study conducted by **Kim, Myung, et al., (2017)** reported that educational programs and workshops improved health care providers knowledge regarding MED. Another supporting study conducted by **Zhao et al. (2018)** showed that the presence of any form of educational instruction had a key impact on improving competency and confidence in the ability to disclose a ME.

In the current study, the MED process was reported by the studied nurses as a perceived barrier to disclosing MEs, which can be attributed to decreased nurses' awareness and knowledge regarding the steps of error disclosure and fear of the vague disclosure process. After implementing instructional guidelines, the nurses perceived barriers regarding the MED process were significantly improved compared to pre-instructional guidelines. The current instructional guidelines present the frame of the MED process, which outlines the necessary steps through a quick guide diagram that empowers nurses' knowledge and motivates them to participate in the disclosure process. The present study finding is supported by **Ock Choi, et al., (2020)** & **Lipitz-Snyderman et al. (2017)**, who concluded that the detailed instructions help to conduct the full MED process and support trainees to be involved in ME disclosure.

Concerning the institutional barriers to MED, the current study found that institutional barriers such as lack of supporting atmosphere, transparency, types

and processes of MED that are not previously declared and peer support services that are not created in the institution to deal with the emotional consequences of error also posed serious barriers to error disclosure among the studied nurses' pre-instructional guidelines. The current findings lie in agreement with **Hamed & Konstantinidis (2022)**, who revealed that institutional barriers to disclosing MEs, including unsupportive institutional cultures and unclear guidelines for action when encountering an error, were considered barriers for MED.

After implementing the instructional guidelines, the study results found that the institutional barrier for MED is the only barrier that did not differ significantly among the studied nurses pre- and post-implementing instructional guidelines. In fact, this finding can be traced back to: first, the target group for the study was the nurses, not the institution; second, this barrier to be improved needs collaboration in a team work group composed of administrative authorities and all health care providers in an environment that provides education and support for error detection and encourages MED in an atmosphere free from fear and punishment. This point of view supported by **Ock, et al., (2018)**. Who emphasized that promoting a culture of transparency in the institutions show promise for improving MED. According to the current study findings, psychological and financial concerns were significant barriers that inhibited MED. Fear of losing patient trust and fear of litigation were the main perceived psychological and financial barriers among the studied nurses pre instructional guidelines, these findings was supported by **Rashed & Hamdan (2019)** study who found that, concerns about litigation and mistrust were the important issues that prevented nurses and doctors to disclose MEs. Although patients' right to know if they were exposed to MEs, the nurses tended to conceal errors and disclosures to avoid losing patient trust (**Najafpour et al., 2021**). But truth-telling is vital to the fidelity involved in the nurse-patient relationship, and MED is likely to help re-establish or strengthen trust in this relationship.

It is worth mentioning that post-implementation of instructional guidelines, psychological and financial barriers to MED improved, with a statistically significant difference between pre- and post-implementation of guidelines. This finding proved that raising nurses' awareness through continuous education and a supportive environment can relieve nurses fears regarding MED, change nurses' perceptions regarding MEs, and make them perceive that the primary rule is detecting errors through disclosure and reporting to prevent future recurrence. This findings is in the same line with the results of

Kim, et al., (2017) who stresses that, education on conceptions and components of MED and training about communicating with patients can improve the overall nurses' perception including psychological and financial concerns regarding MED.

Conclusion:

The current study findings concluded that all studied nurses were exposed to MEs and had perceived barriers to disclosing errors. Moreover, confidence, knowledge, psychological, financial, and institutional barriers were the most perceived barriers for MED among the studied nurses' pre-instructional guidelines. Post-implementing instructional guidelines, there was a significant improvement in all perceived barriers subscales of MED except for the institutional barriers' subscale.

Recommendations:

- Instructional guidelines for medical error disclosure should be integrated into the curricula of nursing schools and educational nursing institutions.
- Raising nurses' awareness regarding medical error disclosure through in-service training programs and education in different health care settings
- Building a no-shame, no-blame culture and establishing non-punitive policies in the institution is a very important strategy to provide a safe environment and encourage medical error disclosure and reporting.
- Future research should target institutions and all health care providers when developing educational guidelines and programs for medical error disclosure.

Acknowledgments:

The researchers would like to express their sincere gratitude and appreciation to all authorities in the hospital and the nurses for their support, voluntary participation, and cooperation in conducting the study.

References:

- **Ahmed, Z., Saada, M., Jones, A., & Al-Hamid, A. (2019):** Medical errors: Healthcare professionals' perspective at a tertiary hospital in Kuwait. *Public Library of Science. PLoS ONE*, Vol. 14, No (5). doi: 10.1371/journal.pone.0217023.
- **Ahsani-Estahbanati, E., Sergeevich Gordeev, V., & Doshmangir, L. (2022):** Interventions to reduce the incidence of medical errors and its financial burden in health care systems: A systematic review of systematic reviews. *Frontiers in Medicine*, Vol. (9). doi: 10.3389/fmed..875426.
- **Aljabari, S., & Kadhim, Z. (2021):** Common barriers to reporting medical errors. *The Scientific*

World Journal, Volume 2021. doi: 10.1155/2021/6494889

- **Al-Omari, A., Al Mutair, A., Shamsan, A., & Al Mutairi, A. (2019):** Predicting burnout factors among healthcare providers at private hospitals in Saudi Arabia and United Arab Emirates: A cross-sectional study. *Applied Sciences*, Vol.(10), No (1). doi:10.3390/app10010157.
- **Alzoubi, M., Al-Mahasneh, A., Al-Mugheed, K., Al Barmawi, M., Alsenany, S., & Farghaly Abdelaliem, S. (2023):** Medication administration error perceptions among critical care nurses: a cross-sectional, descriptive study. *Journal of Multidisciplinary Healthcare*, Pp.1503-1512. doi: 10.2147/JMDH.S411840.
- **Bam, V., Safowaa, A., Lomotey, A., & Nkansah, A. (2021):** Nursing students' perception of medical errors: A cross-sectional study in a university. *Nursing Open*, Vol.(8), No (6), Pp. 3152-3160. doi: 10.1002/nop2.1028.
- **Battles, J., Azam, I., Grady, M., & Reback, K. (Eds.). (2017):** *Advances in Patient Safety and Medical Liability*. Agency for Healthcare Research and Quality. https://www.ahrq.gov/sites/default/files/publications/files/advances-complete_0.pdf.
- **Canadian Patient Safety Institute. (2011):** Canadian disclosure guidelines. Being open with patients and families.
- **Carver, N., Gupta, V., & Hipskind, J. (2022):** Medical errors. In *StatPearls* [Internet]. National Library of Medicine. StatPearls Publishing. <https://www.ncbi.nlm.nih.gov/books/NBK430763/>
- **Choi, E., Pyo, J., Ock, M., & Lee, S. (2019):** Nurses' perceptions regarding disclosure of patient safety incidents in Korea: a qualitative study. *Asian Nursing Research*, Vol (13), No (3), Pp: 200-208. doi: 10.1016/j.anr.2019.05.002.
- **Gallagher, T., Hemmelgarn, C., & Benjamin, E. (2023):** Disclosing medical errors: prioritizing the needs of patients and families. *BMJ Quality & Safety*, Vol.(32), No. (10). doi: 10.1136/bmjqs-2022-015880.
- **Hamed, M., & Konstantinidis, S. (2022):** Barriers to incident reporting among nurses: a qualitative systematic review. *Western journal of nursing research*, Vol. (44), No. (5), Pp.506-523. doi: 10.1177/0193945921999449.
- **Harrison, R., Walton, M., Smith-Merry, J., Manias, E., & Iedema, R. (2019):** Open disclosure of adverse events: exploring the implications of service and policy structures on practice. *Risk management and healthcare policy*, Vol. (12), Pp: 5-12. doi: 10.2147/RMHP.S180359.
- **Irani, P., Dehghan, M., & Mehdipour, R. (2023):** Iranian nurses' attitudes towards the disclosure of

- patient safety incidents: a qualitative study. Research Square, doi: 10.21203/rs.3.rs-2501935/v1.
- **Kaldjian, L. C. (2021):** Communication about medical errors. Patient education and counseling, Vol.(104), No.(5), Pp: 989-993. doi: 10.1016/j.pec.2020.11.035.
 - **Khammarnia, M., Setoodehzadeh, F., Ansari Moghaddam, A., Rezaei, K., & Peyvand, M. (2021):** Medical Errors and their effective Factors in Iranian Physicians: A Systematic Review. Razi Journal of Medical Sciences, Vol.(28), No. (10), Pp:58-73.
 - **Kim, C., Myung, S., Eo., & Chang, Y. (2017):** Improving disclosure of medical error through educational program as a first step toward patient safety. BMC medical education, Vol. (17), No.(1), Pp:1-6. doi: 10.1186/s12909-017-0880-9.
 - **Lipitz-Snyderman A, Kale M, Robbins L, Pfister D, Fortier E, & Pocus V, (2017):** Peers without fears? Barriers to effective communication among primary care physicians and oncologists about diagnostic delays in cancer. BMJ Qual Saf., Vol.(26), No.(11), Pp: 892–8. doi: 10.1136/bmjqs-2016-00618.
 - **Mohamed, S., Hendy, A., Ezzat Mahmoud, O., & Mohamed & Mohamed, S. (2022):** Matterng perception, work engagement and its relation to burnout amongst nurses during coronavirus outbreak. Nursing Open, Vol. (9), No. (1), Pp: 377-384. doi: 10.1002/nop2.1075.
 - **Mostafa, Z., Al-Morsy, A., El-Bana, E., Alareed, H., & El-Shabrawy, E. (2022):** Barriers to Safety Event Reporting for Nurses at Beni-Suef University Hospital, Beni-Suef, Egypt. Egyptian Journal of Medical Research, Vol.(3), No. (1), Pp:-359. doi: 10.21608/ejmr.2022.223233.
 - **Murphy R, Goucher S, Sullivan C, Moloney-Johns A, Derbidge C, & Henricksen J (2021):** How to Disclose Medical errors and Unanticipated Outcomes. Health University of UTAH.
 - **Najafpour, Z., Arab, M., Haghghi, S., Shayanfard, K., Yaseri, M., Hatamizadeh, M., & Bahramnezhad, F. (2021):** Nurses' Decisions in Error Reporting and Disclosing Based on Error Scenarios: A Mixed-method Study. Health Scope, Vol.(10), No. (3). doi: 10.5812/jhealthscope.114868.
 - **Ock, M., Choi, E., Jo, M., & Lee, S. (2020):** General public's attitudes toward disclosure of patient safety incidents in Korea: results of disclosure of patient safety incidents survey I. Journal of patient safety, Vol.(16), No.(1), Pp.84. doi: 10.1097/PTS.0000000000000428.
 - **Ock, M., Choi, E., Jo, M., & Lee, S. (2018):** Evaluating the expected effects of disclosure of patient safety incidents using hypothetical cases in Korea. PLoS One, 13(6), e0199017.
 - **Ranaei, A., Gorji, H., Aryankhesal, A., & Langarizadeh, M. (2020):** Investigation of medical error-reporting system and reporting status in Iran in 2019. Journal of Education and Health Promotion, Vol.(9). doi: 10.4103/jehp.jehp_73_20.
 - **Samundeeswari, A., & Muthamilselvi, G. (2018):** Nurses knowledge on prevention of medication errors. Journal of Medical Science and Clinical Research, Vol.(6), No.(3), Pp: 274-296. doi: 10.18535/jmscr/v6i3.45.
 - **Swinfen, D., Labuschagne, M., & Joubert, G. (2023):** Disclosing medical errors: how do we prepare our students? BMC Medical Education, Vol.(23), No.(1), Pp:191. Doi: 10.1186/s12909-023-04125-3.
 - **Welsh, D., Zephyr, D., Andrea L., Douglas. E., Joseph. L., & Jones. M. (2018):** Development of the Barriers to errors Disclosure Assessment (BEDA) Tool. J patient Saf. available in PMC 2018, J Patient Saf. Author manuscript; available in PMC 2018 December 30.
 - **Welsh, D., Zephyr, D., Pfeifle, A., Carr, D., Fink III, J. , & Jones, M. (2021):** Development of the Barriers to Error Disclosure Assessment (BEDA) Tool. Journal of patient safety, Vol,(17), No.(5). Pp: 363-374 .doi: 10.1097/PTS.0000000000000331.
 - **World Health Organization. (2021):** Global patient safety action plan 2021-2030: towards eliminating avoidable harm in health care. World Health Organization.
 - **Zhao Y, Cao Y, CheL, Fu Q, Song S, Zhao B, (2018):** Ethical dilemma of identity disclosure faced by medical students in clinical clerkships: a nationwide multicenter study in China. PLoS One, Vol.(13), No.(7). doi: 10.1371/journal.pone.0200335.

This is an open access article under
[Creative Commons by Attribution Non-Commercial \(CC BY-NC 3.0\)](https://creativecommons.org/licenses/by-nc/3.0/)
 (<https://creativecommons.org/licenses/by-nc/3.0/>)