Understanding the Barriers to Nurses Error Reporting and Disclosure: A Mixed Methods Study

Zhila Najafpour (✉ zhila.najafpour@gmail.com)

Ahvaz Jondishapour University of Medical Sciences <https://orcid.org/0000-0003-0258-8015>

Mohammad Arab

Tehran University of Medical Sciences

somayeh biparva

Ahvaz Jondishapour University of Medical Sciences

Mehdi Yaseri

Tehran University of Medical Sciences

Maryam Hatamizadeh

Tehran University of Medical Sciences

Zahra Goudarzi

Tehran University of Medical Sciences

Fatemeh Bahramnezhad

Tehran University of Medical Sciences

Kamran Shayanfard

Universite du Luxembourg

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Abstract

Background: Ensuring that nurses report errors and disclose related outcomes to patients is a movement toward creating a culture of transparency. Different factors might contribute to the tendency to under-report or to disclose. This study aim to investigate the barriers of the reporting and disclosing of medical errors via nurses' perceptions.

Methods: A mixed methods study were used to identify barriers of error reporting and disclosing. For the aim of this study, a total of 491 nurses participated in the quantitative phase and 22 nurses in the qualitative phase, Iran, 2018. The data for the quantitative phase was collected based on a questionnaire and were next analyzed by descriptive and analytical statistics. Through a scenario-based method, the qualitative data were gathered and analyzed based on content analysis approach.

Results: The results showed that the most important perceived barriers with the highest impacts coincided with educational(64%), motivational(64%), and managerial factors (62%) and the univariate analysis showed a significant correlation between error-reporting mechanisms, education, and consequences of reporting errors domains and independent variables($p < 0.05$). Based on SEM analysis, the most important perceived barriers were educational and motivational domains (ES:1.33, SE:0.16). Interview results were classified into three categories: error perception, error reporting, and error disclosure. In fact, 55% of the interviewed nurses identified the existence of at least one error in scenarios and 66% of participants stated that they had reported errors. Overall 83% of the participants recruited had negative attitude toward full disclosing the errors to patients.

Conclusions: Our results highlight the multifactorial aspects in error reporting and disclosing. Lack of knowledge about error and its reporting, inappropriate feedback and weakness in supportive actions represent the inhibitors of reporting and disclosing errors. Actually, a guideline should be formulated on error disclosure to increase transparency and improve communication with patients.

Background

Medical errors have been recognized as a serious problem in health system. Many patients are harmed or die due to medical errors during their stay at hospitals. Medical errors are defined as "an actual or a potential lapse in the care provided to a patient through the performance of a health service or a healthcare professional"[1]. Some studies report that 4-16.6 % of injuries to the patients have occurred following a medical error during their stay at hospital and resulting in almost 30 \$ billion financial losses while a significant percentage of this large charge can be prevented[2][6]. Therefore, it is essential to develop awareness about procedures to improve patient safety and prevent medical errors.

As the success of error reporting systems depends on the users' commitment, Institute of Medicine (IOM) puts substantial emphasis on creating mechanisms for error reporting to identify and amend the errors as a key to enhance safety [3, 4] . A considerable portion of medical errors is labeled as nurses' errors that occur when providing patients' care and annually cause thousands of deaths or harm to patients[5]. But nurses like other medical staff still remain reluctant to report any medical errors[6]. Underreporting of adverse events is estimated to range from 50%–96% annually[7]. Studies have pinpointed that caregivers are afraid of the negative consequences like disapproval or reprimands in the presence of patients [8-11]. Also, care givers have different approaches to disclose medical errors and most of them would be less inclined to disclose errors[12]. Although patients are not only willing to have the medical malpractices to be fully disclosed but also they seek to be informed about all harmful errors, not just errors that are obvious to them[13-17].

In Iran, there is no published formal statistics about the rate of medical errors and no national protocol for error disclosing. As some studies indicate, the rate of error reporting is very low in comparison with the reported ratios in developed countries[18]. However, the reported percentages about patient complaints reveal this fact that this rate would not be low[19] and it does not seem to be lower than the errors practiced in the health systems of the developed countries. Indeed, understanding of the factors that influence non-reporting error in health care system in Iran is a fundamental requirement for improving patient safety. Thus, this research aims to identify nurses' perceptions about barriers of non-reporting error as well as exploring the

concerns of nurses in the disclosure of medical errors. These data can be used for minimize or removing patient safety barriers in health care system.

Methods

Design

This mixed study (quantitative – qualitative) was conducted in 2018, Tehran, Iran. Methodologically, the quantitative part was completed by administrating a questionnaire devised by researchers and the quantitative part was conducted based on the scenario.

Setting and population

This study was conducted in five hospitals affiliated to Tehran Universities of Medical Sciences. The sample population included all the nursing staff engaged in direct patient care who have at least 1-year clinical experience as a nurse (approximately 3350 nurses).

Sample size

For the aim of this research, the required sample size was 600 nurses that was determined based on a power of 90% (using 95 % as the confidence level for confidence interval estimates) and the margin of error equal to 0.05. To decide on the participants, all 16 hospitals were divided into three categories based on the number of beds, category one (< 200 beds), category two (200-500 beds) and category three (> 500 beds). Finally, five hospitals were randomly selected in proportion with hospital numbers in each category.

Questionnaire development

A questionnaire was developed based on the literature review to assess the reasons why medical errors are not reported. Face and content validity of the questionnaire was confirmed considering experts' opinion (three nurse experts, four health service management professors, one epidemiologist, and two hospital executive staff). We were requested from experts to respond the questionnaire for the assessment of the instrument regarding the clarity, concreteness, centrality and importance of each item using a 4-point rating scale. Next, we continued the rounds until 70 percent agreement was reached. Meanwhile, we edited questions' face validity based on the experts' opinion. To measure reliability, the questionnaire was distributed among 20 nurses two times after a two-week interval. In both times the questionnaire was correlated with an 81% confidence. The questionnaire was comprised of two parts. The first part included seven questions enquiring demographic information. The second part contained 34 questions in six domains, six questions about managerial factors, ten items to assess the consequences of reporting errors, six items asking about education, five items about motivation and seven items related to error-reporting mechanism. Each item was rated on a five-point Likert-type scale ranging from one (strongly agree) to five (strongly disagree); in this way, the process of coding and tabulation of questions was straightforward and left no room for rater subjectivity. Meanwhile, additional reasons for not reporting medical errors, preferred type of reporting system and level of tendency to disclosure errors to patient were inquired via open-ended questions.

Data collection procedures

One of the researchers visited five hospitals and explained the study purposes and data collection procedures to the nursing managers. After obtaining permission, the questionnaires were allocated to the five hospitals based on the proportions of their nurses. Questionnaires were distributed among nurse wards for the three eight-hour shifts per day (morning, afternoon, and night). Participants were requested to return the completed questionnaires after 1 week. In sum, 750 questionnaires (150 more than the number of required sample size) were distributed, and 491 were returned, resulting in a response rate of 81%.

Qualitative methods

This qualitative section which was designed as a scenario-based experiment was conducted as a complementary phase to the quantitative counterpart. We sought to understand nurses' attitudes toward medical errors, reporting error, and their preferences in the disclosure of error. The interviews were guided by a script with open-ended questions. Five error scenarios were developed prior to initiating this phase and all of the interviewees studied and answered the questions (see Appendix 1). The scenarios had been prepared based on literature review and were modified by two physicians, two nurses, one quality improvement staff, and a patient safety specialist. In addition, the scenarios were piloted by a physician and a nurse for the authenticity and relevance purposes. The scenarios differed in terms of error nature, participants, error consequence, policy procedure protocol, scope of actions, and team relationship.

We used a convenience sampling technique to identify interviewees within each hospital. Interviews were conducted in places where interviewees were comfortable for speaking about the medical errors; they were held in break room of nurse wards or in the quality improvement office). We conducted 22 semi-structured interviews with nurses who were working in five hospitals in Tehran (2 males and 20 females among whom 4 were head-nurses). Nurses with less than 1-year work experience were excluded. After describing the objectives and gaining consent, information was collected through the scenarios.

One of the researchers who was expert in qualitative interview techniques conducted all the interviews (FB). Interviews were conducted until they led to data saturation. Each interview lasted on average 40 minutes. Before initiating the interview, the interviewers asked if they had the permission to record the conversation. During the interview, no definition of error was provided to the participants. First, participants studied the scenarios and then the interviewer asked the questions. Interviews were recorded and transcribed verbatim. The transcribed interviews were returned to the interviewees for further checking.

Data analysis

To answer the research questions, the collected data were analyzed both quantitatively and qualitatively. For the quantitative analysis, descriptive statistics as well as inferential statistics were used. As the number of questions in each questionnaire domain varied, we standardized the scores of all domains. Structural Equation Modeling (SEM) was used to examine the relationship between different domains related to error reporting barriers to compare the effect of each domain on the overall score. The significance level is assumed 0.05 in all analyzes. All analyses were carried out by SPSS version 20 and AMOS software programs.

For the qualitative phase, content analysis was used to determine the themes, categories and sub-categories of the factors associated with reporting and disclosing errors. Two of the authors independently carried out the overall readings and then discussed about their perceptions. In the next step, meaningful units related to the aim of the study were identified and marked. Finally, these units were separately condensed by the authors and were then discussed for final agreement [12, 17, 18]. In case of disagreement, the transcriptions were read and analyzed again, after all, the derived themes were complemented by the participants' remarks.

Ethical consideration:

This study has been confirmed by the Ethics Committee of the Tehran University of Medical Sciences. Written consent was obtained from all participants and confidentiality was assured and maintained for all participants.

Results

Quantitative phase

Demographic characteristics

In this study, 491 questionnaires were analyzed. The compiled demographic information revealed that the average age of participants was 33; 88% of the research subjects turned to be female while 60% of them had 10 years of experience and

worked with rotating shift schedules; the majority of the participants were married and had an undergraduate degree (See Table 1).

Barriers of reporting error

Concerning the participants' perceptions, education factors (64 %), motivational factors (64 %), managerial factors (64%), error consequences (62%), and error reporting mechanism (48%) had respectively the most important role in non-reporting error. Statistical results approved that there is a significant correlation between error-reporting mechanisms, education, and consequences of reporting errors domains and independent variables such as age, sex, and work experience, respectively (See Table 2). The relationship between various domains' non-reporting error examined by the SEM analysis is shown in Figure 1, after calculation of coefficient regression (C.R.), structural model revealed that all paths were of absolute value less than z-score (1.96) which indicates that there is no significant difference between them. In sum, the most important perceived barriers with the highest impacts were educational and motivational domains (See Table 3).

Qualitative phase

Twenty-two nurses were recruited to the study. All of the participants held a Bachelor of Science in Nursing. Their average age and work experience were 36 and 10 years, respectively. They were interviewed according to the designed scenario and responded to the questions revolving around the five scenarios. They expressed various points about error, reporting and disclosure error in each scenario. We provided a brief description of the emergent themes related to error reporting or disclosing in Table 4.

Error perception

The nurses' perceptions of the error were directed toward the type and consequences of error for the patient. In fact, 55% of nurses identified the errors in scenarios (see Table 5). They defined errors as "deviation from the standards, policy procedure, and protocols and from a physician's order ". In Scenario 3, the nurses interpreted errors as "deviation from the implementation of safety standards in blood transfusions such as lack of patient identification and control of vital signs in the first 15 minutes of blood transfusion". Nurses mentioned protocols such as safe patient transportation, patient assessment, emergency trolley checking and so on. Distortion from protocol in each scenario was also identified as an error by nurses. However, professional and communication skills were ignored in scenarios by most of the participants. A participant who respond "communication is a part of patient care, I think communication among personnel is not very good, we keep silent after understanding a professional error". Another said, "If I understand a problem or harm created by a physician for patient, I will likely prefer not to confront with the doctor; I will just be silent as saving their reputation is very important among others (physicians, managers, nurses, patients). It is clear all the time professional reputation and others' reactions are very important" (Participant 4). It seems there is an ambiguity in error definition; in scenarios one and two, more than half of nurses did not detect the errors and marked the scenario as error-free. One of the nurses stated, "In the first year that I started my project I did not commit any error" (Participant 7). Participants identified negative outcomes in most of the scenarios but they did not consider them to have the potential for real harm, therefore, according to the viewpoint, there is no need for reporting an error. When care-giver act out side of their task did not consider as an error by some of nurses.

Participants emphasized on recruiting less-experienced medical staff particularly in high risk wards such as intensive care and emergency wards, high number of patients to nurse, and keeping patients with critical situation in general wards without standard nurse-to-patient ratios as main reason of not reporting error . One of the participants expressed, "you are expected to work flawlessly in a very busy environment as we are enforced to take care of intubated patients in general wards instead of ICU". Another nurse stated, "in some of my working shifts, I have to take care of around 15 patients, I don't simply have time to give patients their medicines, let alone to report the errors. You know, error reporting goes for standard nurse-patient ratios. In such a messy situation, it's very probable for me to do serial errors." (Participant 13). Generally, while most of the participants were under time pressure, only a few referred to lack of time as a barrier. Error-reporting mechanism was not stated as a factor in not reporting. One of the nurses believed, "I think it's the system duty to teach a nurse who is newly introduced into the

workplace with less experience. You know adequate monitoring should also be implemented in place. I think weak nursing performance is a sign of weaknesses of nursing education especially in Continuing Education Centers at hospitals”(Participant 1).

Reporting error system (formal vs informal)

Paper-based reporting system was used in studied hospital. The results showed that 66 percent of participants would report the error in scenarios but not exactly through formal reporting system because they believed they received no feedback when they formally disclosed a mistake (especially an error without harm); this would reinforce the perception that reporting is not important. In other words, nurses prefer to report the errors to their head nurse rather than to hospital incident reporting system. In addition, the nurses strongly believed that there was no need to report erroneous incidents without harm. Another participant said, “The head-nurse may prefer not to disclose the errors off the ward” (Participant 2). Error reporting is influenced by participants’ perception and the possible consequences; for instance, if a scenario illustrated an error that did not lead to a harm in patients, the nurses believed that they choose not to report the error. The majority of participants agreed on concerns of inappropriate reaction and lack of support by the hospital authorities especially the nursing manager. One other participant maintained “I believe that the system doesn’t look for roots of error, but wants to find a nurse to blame.” A nurse stated, “Once I participated in a meeting of morbidity committee for an inadvertent error, I can remember that I was treated so badly that I felt insulted as a human being (Participant 6). In scenario 1, a participant commented that he would not report the scenario, “Because nothing has happened”. It seems that error-reporting often varies depending on how much nurses trust others within the team. A nurse said, “Once I reported an error, the nursing manager decreased my evaluation score and my payment. I’ve come to the conclusion that there is no need to report an error which wouldn’t cause a harm to a patient” (Participant 4). The majority of respondents agreed on “nurses’ insufficient familiarization with error documentation”, “fear of the legal liability”, and “concern for financial losses are not the reason for non-reporting error. But nurses would face some workplace penalties such as changing their ward and increase in payroll deductions which can postpone the procedures of being a head-nurse, supervisor or nursing manager.

Disclosure of medical errors to patients

While describing the affairs in scenarios, nearly half of the participants did not provide disclosure while 37% disclosed partially (see table 5). There are a common disagreement (83%) toward full disclosing (explain what happened and how) the medical errors to patients especially when there is no serious harm caused to the patient. Although the majority of respondents agreed that this is a patient’s right to know about any errors occurred at hospital, they tended to conceal errors to prevent any possible consequences after disclosures. Some reasons were listed as missing patient trust, reactions from patients or their family, damage to professional reputation and the possibility that a patient might sue or reprimand the nurse. Some participants agreed with partial disclosure (just to describe what had happened without specific details); they believed that providing details could disrupt the relationships between the medical professionals and the public, but partial disclosure might result in improved communication in a positive way. One of the participants said, “I committed a medication and I told the patient about it; I assured him that it had no side effect and was not risky. However, I was so desperate by the reaction of the patient and his family who asked the head-nurse to change the faulty nurse so that I had to leave my workplace that day, I felt so bad for a while” (Participant 13). In sum, respondents were not likely to provide full details of errors.

Discussion

Based on our findings, the main barriers of non-reporting errors were educational, motivational, and managerial factors and majority of participants preferred informal reporting than formal. Nurses hesitated to provide errors specifications to patients as a full disclosure.

The primary reason for not reporting errors in this study was weaknesses in nursing training programs. Nurses have to be trained about the definition and types of errors and near miss incidents, error management and how to report errors. Harrison stated provision of training is essential to overcome the reported barriers faced by nurses. Literature has consistently

highlighted the role of education, communication, and team working in the promotion of error reporting [20, 21]. Therefore, it seems that appropriate training about errors, error-reporting methods [22] and patient safety requirements[23] is necessary to encourage error reporting.

Based on our results, a huge number of nurses maintained that they preferred to report informally (verbally to the head-nurse) when errors occurred within the ward. Moreover, error reporting was contingent upon the severity of the consequences to the patients; they would not rather report near miss cases or errors without consequences even informally. This reflects that they fear intimidation, retribution or punitive measures [24-26]. However, our results showed that there remained ambiguities about errors definition and nurses hesitated to report errors especially to healthcare formal systems. They stated unreported errors might be due to several factors such as inadequate understanding of what constitutes an error or protocols, unpleasant behaviors, previous inappropriate and disproportionate reactions of the managers. In addition, nurses perceived that they were blamed or criticized more for committing an error compared to physicians. However, in one study published by Mayo Clinic, it was reported that the nurses tend to report the error to physicians[11] Such disparity could be due to the cultural differences and the more formal relationship between nurses and physicians in Iran.

It is essential to create a positive climate as a motivator factor to encourage nurses to report. Legal protection for reporters needs to be reinforced. The shortage of nurses and failure to allocate nursing services to patients concerning patients' conditions inadvertently lead to negligence and defects in such duties[27]. These actions are considered as managerial factors. Our results indicated that the managers' inappropriate reactions, especially nursing manager, in response to the reported error, their focus on human factors versus systemic approach, and the subsequent reprimand were among the barriers hindering error reporting. These findings are consistent with research results which allude to the reasons for not reporting errors including lack of positive feedback as well as the concern that managers might develop a negative attitude toward the nurses[28][29]. Garbutt et al stated that error reporting system may cause under-reporting incidents due to lack of feedback, time constraints, fear of shame, blame, litigation or professional censure[30]. Our study, however, showed that the aforementioned factors were not the main barriers of not reporting errors among the participants. All nurses, not only newly employed ones, need to improve their knowledge, attitude, and skills about maintaining patient safety with providing clear definitions of near misses, errors and their types because most of the nurses were informed about how to report error but they did not prefer to report. The presence of a simple and user-friendly incident-reporting system and unexaggerated managerial feedback without negative consequences with emphasis on system thinking can positively affect the process and manner of error reporting and patient safety culture in health care system.

Research has documented that disclosure of adverse events and discussion of details with patients is uncommon. Espin and Fein reported that people firmly believe in error disclosure to patients[31, 32]. O'Connor's review reveals that healthcare professionals support the disclosure of errors that lead to adverse events but there is a gap between ideal disclosure practice and reality[33]. It seems that to reach effective disclosure practices, a coaching role at healthcare system is needed to instruct professional ethics, communication skills and disclosure guidelines to eliminate the punitive measures after voluntary reporting and improve the level of patient safety culture[34, 35].

Limitation

Concerning the fact that the study was carried out in five hospitals, caution is needed to generalize the results.

Conclusion

Barriers of error reporting in hospitals are multifactorial; lack of knowledge about error and reporting mechanisms, inappropriate feedback and adverse reactions are generally believed as the most important inhibitors of error reporting. Such incidents occur generally due to some educational, motivational and managerial factors. Moreover, nurses still believe that error reporting may bring about subsequent harms. The combination of these factors hinder error reporting and call for interventions in the areas of education, sociocultural values as well as managerial support to create a positive attitude, motivation and incentives to disclose an error. The obtained results urges on educational planning and system thinking which

focuses on encouraging error reporting with the purpose of improving patient safety culture among healthcare providers especially nurses.

List Of Abbreviation

IOM: Institute of Medicine

SEM: Structural Equation Modeling

Declarations

Ethics approval and consent to participate

This study approved by ethics committee affiliated to Tehran University of Medical Sciences. Written informed consent was obtained from participants included in the study.

Availability of data and materials

The datasets generated and/or analyzed during the current study are not publicly available due to ethics approval but are available from the corresponding author on reasonable request.

Consent for publication

Not applicable

Competing of Interest

The authors declare that they have no conflicting interests.

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Authors' contributions

ZN,KM: participated in data gathering (interview) and interpretation of the data and drafted the manuscript.

FB: participated in data gathering (interview) and interpretation of the data and helped to revise the initial draft.

ZG: participated in data gathering and interpretation of the data and helped to revise the initial draft.

MY: data analysis and helped to revise the initial draft.

MA: design and interpretation of the data and drafted the manuscript.

MH: Developed questionnaire and participated in data gathering.

SB: Editing the article and translating it to English

All authors read and approved the final manuscript.

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Tables

Table 1: Raw variable reporting error		
variable		N (percent)
Age	Median (range)	31 (21 to 57)
	mean± SD	33.4 ± 7.9
Age category	≤ 30	221 (45.0%)
	31 - 40	178 (36.3%)
	41- 50	74 (15.1%)
	51+	18 (3.7%)
gender	female	434 (88.4%)
Education degree	bachelor's	462 (94.1%)
	masters	29 (5.9%)
Nursing Shift	fix	175 (35.6%)
	In flow	316 (64.4%)
Marital status	married	218 (44.4%)
Work experience	0-5	171 (34.8%)
	6 -10	163 (33.2%)
	15 -11	80 (16.3%)
	16_20	54 (11.0%)
	21_25	23 (4.7%)
Hospital	Baharlo	99 (20.2%)
	Rozbeh	50 (10.2%)
	Shariati	150 (30.5%)
	Valiasr	90 (18.3%)
	Ziyaiyan	102 (20.8%)
Ward types	emergency	65 (13.2%)
	intensive care unit	75 (15.3%)
	medical	227 (46.2%)
	surgery	124 (25.3%)

Table 2: Effective factors for not reporting error (univariate analysis)																
variable		Managerial factor			Error consequence			Educational factor			Motivational factor			Mechanism of reporting error		
		mean	SD	P*	mean	SD	P	mean	SD	P	mean	SD	P	mean	SD	P
Age	≤ 30	54.7	22.6	0.8	52.9	22.8	0.54	57.8	18.6	0.62	56.1	22.8	0.23	47.9	13.4	0.05
	31 - 40	55.3	22.9		52.6	21.9		57.3	19.8		56.8	23.2		43.8	12.1	
	41- 50	57.4	19.2		56.7	21		54.8	18.5		56.7	19.3		49.7	12.1	
	51+	55.1	22.5		60.7	19.2		58.3	19.5		65.8	14.5		46.1	8.5	
sex	Female	55.9	22.3	0.13	54.1	22.3	0.28	56.4	19.4	0.01	56.3	22.6	0.128	46.3	12.8	0.83
	Male	51.2	21		50	20.5		63.2	14.7		60.6	18.7		46.5	12.2	
education degree	Bachelor	54.9	22.3	0.1	53.4	22.2	0.69	57.5	19	0.12	56.9	22.2	0.53	46.4	12.6	0.62
	Master	62.1	19.2		56.8	20.4		51.9	18.6		55.5	22.5		44.8	14	
nursing shift	Fix	56.5	21	0.62	55.5	20.6	0.41	56.1	20.4	0.36	57.6	22.4	0.87	45.1	11.6	0.41
	Turnover	54.7	22.8		52.6	22.9		57.8	18.3		56.3	22.2		46.9	13.3	
ward types	Emergency	55.1	25.5	0.3	56.9	24.5	0.96	56.8	23.6	0.09	56	31.2	0.2	46.5	13	0.26
	Intensive care unit	50.5	18.9		50.5	18.9		56.1	18.9		54.1	19.2		48.6	11.9	
	Medical	57.2	22.9		54.4	22.4		55.7	18.1		55.9	20.6		45.5	12.8	
	Surgery	54.9	20.6		52.3	22		60.7	18		60.3	21		46.3	12.8	
marital status	Married	56.8	21.5	0.19	54.4	20.9	0.96	55.8	18.3	0.25	56.2	20.8	0.43	46.3	12.7	0.62
	Single	53.5	22.9		52.6	23.5		58.9	19.8		57.5	24		46.3	12.8	
work experience	0-5	54.6	22.5	0.58	51.2	22.6	0.02	58	18.6	0.25	55.7	23.3	0.71	46.7	12.4	0.88
	6 - 10	53.7	23.5		53.2	22.8		57.9	19.9		57.9	24.1		45.2	13.8	
	11-15	56.2	21.1		53.5	21.8		56.8	17.9		57.1	19.6		46	11.3	
	16_20	58.1	18.7		61.7	19.7		55.4	19.8		55.3	19.6		45.1	13.4	
	21_25	62.1	20.5		55.9	16.2		51.6	18.1		59.1	14.4		47.3	9.9	

Table 3 : Correlations between domains score				
Domains	Estimate	S.E	C.R.	p-value
Managerial	1			
Error consequence	1.052	0.143	7.36	***
Educational	1.333	0.169	7.87	***
Motivational	1.310	0.176	7.44	***
Reporting error mechanism	0.876	0.134	-6.53	***

**Correlation is significant at the 0.01 level (2-tailed).

Table 4 - 1: Error and error reporting barriers based on the scenarios

Theme	Reasons for not reporting medical errors
Error perception (Types, causes, and consequences of error)	<ul style="list-style-type: none"> Ambiguity and weakness in error definitions (undefined a near miss as an error, ignore communication failure) Deviation from standards and a physician's order Severity of error and unimportant errors with no injury (less severe errors less likely to be reported or undefined a near miss as an error) Nurses unawareness of guidelines, standard and error management (especially prevalent in new staff) Untrained staff (error identification, error type, lack of legal information)
Reporting error (formally vs informally)	<ul style="list-style-type: none"> Ineffective reporting system: time-consuming, absence of feedback and communication about error, without any significant change Hesitation in reporting to formal system (preference to report error with no harm or less to head-nurse instead of someone out of ward) Believing in reporting error to be held by head nurse Increases workload (reporting needs free time, forgetting to make a report occurs when the ward is busy) Improper reaction of the nurse manager, lack of supportive colleagues (head-nurse) Punitive responses to error (Future negative effects on annual evaluation, promotions, occupational position or changing their ward) Concern about financial loss, legal consequences and losing job

Table 4 - 2: nurses' preference for error Disclosure based on the scenarios

Theme	Reasons for disclosure
No disclosure	<ul style="list-style-type: none"> patient distrust toward caregivers improper reaction of patients or families Error would be without injury Being worried about legal follow up Causing patient anxiety unawareness about whose responsibility it is and how it should be reported (Not my responsibility) patient request for discharge without physician decision and stop therapeutic process Unsupportive cultures (especially managers) Lack of transparency with clear instruction and guideline Ruined professional reputation
partial disclosure	<ul style="list-style-type: none"> Building trust to caregivers improving communication No more details needed Punishment and Legal problems
Full disclosure	<ul style="list-style-type: none"> patient right If serious injury occur to patients Obvious error occurrence (disclose an error if it is apparent) Having a malpractice insurance

Table 5 : Nurses' Preference in Error Perception, Error Reporting And Disclosing Based on the Scenarios (Percentage)						
	Perception from error	error reporting		Tend to disclosure		
		Formal	informal	full	partial	No disclosure
Scenario 1	45	20	40	0	0	100
Scenario 2	18	10	22	0	0	100
Scenario 3	95	27	40	19	81	0
Scenario 4	80	30	56	13	59	28
Scenario 5	40	40	46	50	45	0
Total (AVE)	55.6	25.4	40.8	16.4	37	45.6

Figures

Figure 1

Relationships between studied domains compared with the effect of each domain on the overall score

Supplementary Files

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