Internal Medicine and Medical Investigation Journal
E-ISSN: 7750-2474
Homepage: www.imminv.com

ORIGINAL ARTICLE

Status of Error Reporting Cultures among Nurses

Running Title: Error Reporting Cultures

Sima Safarzadeh1, Abasat Mirzaei2,3*, Zeinab Abbasi4

[1] MSc of Health Services Management, Faculty of Health, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran

[2] Assistant Professor, Department of Health Care Management, Faculty of Health, Tehran Medical Science, Islamic Azad University, Tehran, Iran

[3] Assistant Professor, Health Economic Policy Research Center, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran

[4] PHD of Health Services Management, Department of Nursing and Midwifery, Tehran Medical Sciences, Islamic Azad University, Tehran, Iran

[*] **Corresponding Author:** Abasat Mirzaei, Email:amacademic@yahoo.com

ARTICLE INFO

Article history Received:
July 12, 2018
Accepted: Sept 21, 2018
Published: Oct 31, 2018
Volume: 4
Issue: 1

Key words:
Error Reporting Culture,Medical Error,Patient Safety, Survey to Solicit Information about the Culture of Reporting (SSICR)

ABSTRACT

Introduction: One of the goals of nursing is to provide safe patient care and medical errors are one of the most important threats in this field. Therefore, the purpose of this study is to assess the status of error reporting culture and determine its relationship with demographic characteristics. **Materials/Methods:** This descriptive,analytical and cross-sectional study was carried out among 239 nurses of amiralmomenin and bouali hospitals. First,face validity and then content validity were performed by 15 nursing experts and the questionnaire was distributed and collected. The normal distribution of data was confirmed by Kolmogorov-Smirnov test. The reliability and construct validity were performed with Cronbach's Alpha test and exploratory factor analysis by Principal Component Method (PCM). The status of reporting culture was determined by computing descriptive statistics and its relation with demographic variables with Pearson correlation test and logistic regression test with SPSS software version 16. **Results**: The content validity with content validity ratio (CVR) and content validity index (CVI) of 0.820 and 0.920 were confirmed. The reporting culture was favorable with a mean and standard deviation of 2.674 and 0.475.The reliability with Cronbach's alpha of 0.747 and the construct validity with a Kaiser-Meyer-Olkin (KMO) of 0.727 and Significance of the Bartlett test were confirmed and 3 subscales were extracted. The relationship between age and work experience with the reporting culture with a correlation of 0.009 and 0.013 with a significant < 0.05 were rejected But with the variable of gender(=female) with a chance of 2.536 and the significant of 0.006 was confirmed. **Conclusion**: Developing a safety culture in hospitals by implementing various health programs improves the reporting culture,but the mental climate is undesirable and requires major steps to reduce worries and negative outcomes after reporting.The presence of female nurses in comparison with men improves the error reporting culture. Perhaps the main reason is patriarchy in Iranian culture.

INTRODUCTION

Medical errors are one of the most challenging issues in the field of health and management of health services And Patient safety is a global issue that has embraced the health system of all countries(1). Medical errors in the United States cause deaths of between 210 and 440 thousand people a year and injure more than one million people(2). According to the World Health Organization, 15 % of health spending is spent on medical accidents And of the 10 patients in the hospital, 1 of them suffered an injury(3).Error reporting is the basis for preventing the occurrence of errors (4). Therefore, it is important to identify the reasons of the low level of reporting in reducing the incidence of medical errors (5). The low level of medical error reporting is a global concern for patient care safety. Nurses' perception of the error reporting barriers is a primary step towards increasing reporting rates(6).

In a study that was carried out in 10 kerman hospitals with 267 nurses, the most important perceived barriers from nurses' point of view in error reporting are important in terms of management, reporting, ethical, reporting and environmental processes(2) And there was an inverse relationship between work environment conditions and drug errors in hospitals affiliated to Tehran University of Medical Sciences And since the subject and focus of the work of nurses is

human, the improvement of physical, mental and psychological health of nurses in the workplace is one of the most important issues that promotes the quality of safe care(7). In a study in Pakistan, When nurses and other medical staff facilitate a positive organizational culture, their commitment to error reporting and error sharing will increase, thereby improving patient safety and reducing their mortality (1).
Reporting culture is an essential component of patient safety culture(4, 8) And According to The American Operative Nursing Guidance Statement, it has been identified as one of the five sub-cultures in the patient-centered safety culture(9) It is also defined as the primary stage in creating a safety culture (10).The healthcare organization's climate, in which employees tend to report errors، is in a climate of trust that is encouraged, fair and even rewarded for reporting errors(8). Therefore, the creation of a safety culture to improve patient safety and treatment outcomes is essential (11). Consequently, determining the status of error reporting culture among hospital nurses is essential in order to plan for improving the safety culture.

MATERIALS AND METHODS

The study population included 239 nurses working in the contract and official staff of Amiralmomenin and Bouali hospitals. The educational, therapeutic and research hospital of Bouali has 420 approved beds, 200 active beds, 70 faculty members and a community of 130 nurses in different positions of metron, supervisor, head nurse and nurse. And The educational, therapeutic and research hospital of Amiralmomenin with 220 beds, one of the oldest Islamic Azad University hospitals, was established in 1979 and is one of the most active hospitals in the south of Tehran with target population of 109 nurses. Therefore, due to the limited number of hospitals, all nurses working in Bouali and Amiralmomenin hospitals are considered as samples. And nurses' reluctance to participate in the study, incomplete completion of the questionnaire and nursing students are not included in the study.
The normal distribution of data was confirmed by Kolmogorov-Smirnov test and the reliability and construct validity were performed with Cronbach's Alpha test and exploratory factor analysis by principal component method and varimax orthogonal rotation. The status of reporting culture was determined by computing descriptive statistics as well as its relation with demographic variables with Pearson correlation tests, nonparametric chi-square (simple logistic regression) and multiple logistic regression with SPSS software version 16. The criterion for determining the desirability or non-desirability of the error reporting culture is based on the comparison of the mean numerical value of the Likert questions and the mean of the responses.

TOOLS

In this study, two questionnaires were used to collect data using the following descriptions: the first questionnaire entitled " Survey to Solicit Information about the Culture of Reporting "(SSICR) was used to evaluate the reported culture as a subculture of the patient safety culture (9), Which consists of 13 items of the Likert Options 4 (I totally disagree "1", disagree "2", agree "3", and I totally agree "4"), also 6 questions is inverse (1, 12, 13).
The second questionnaire, "demographic questionnaire for nurses", After Survey the demographic questionnaire of the article " Nurse perceptions of organizational culture and its association with the culture of error reporting: a case of public sector hospitals in Pakistan " (1) and demographic questions related to "Patient Safety Culture Questionnaire" (14) and the research paper " The relationship between medication errors and nurses' work environment "(7), it was prepared and native .

Validity & Reliability

Validity and Reliability of the Error Reporting Culture Tool include 4 parts of face validity, content validity, construct validity, and reliability. The face validity was accomplished using the translation and translation-back method of the questionnaire by 3 experts in cooperation with a Translation Institute. The questionnaire was first translated from English to Persian by a specialist consulted by healthcare colleagues. Then translated by another expert in collaboration with a Translation Institute from Persian to English. The final comparison of the original English text of the questionnaire with transcript was carried out by an overseas expert. The final review and necessary modifications were carried out in consultation with 3 experts and Finally, the Persian text was provided (Table1). The demographic questionnaire of nurses was also arranged in consultation with professors and nursing community experts.
For content validity and validation of data collection tools, CVR was calculated using three criteria: "necessary", "useful", "useful but unnecessary" and "unnecessary" based on lawshe index. The minimum CVR for 15 nursing staff is 0.49. The formula for CVR calculation is shown in Equation 1, where N is the total number of specialists participating and Ne is the number of specialists who have voted for the "necessary" criterion.

$$CVR = \frac{\left(Ne - \frac{N}{2}\right)}{\frac{N}{2}} \quad (1)$$

and the CVI was also calculated using the four criteria "fully relevant", "related but need to be reviewed", " Needed a serious review" and "unrelated" criteria using equation 1. Where Na and Nb are respectively the number of specialists who completed the "fully relevant" and "related but need review" criteria. The minimum CVI comparison index is 0.79(15).

$$CVI = \frac{(Na+Nb)}{N} \quad (2)$$

The forms of evaluation of the error-reporting culture questionnaire were designed with 13 questions and were distributed to 15 nursing specialists and collected after obtaining comments. Then the data was entered in Excel and the CVR and CVI values of the whole tool were calculated to be 0.820 and 0.92, respectively. Then CVR and CVI questions were analyzed, and 3 questions (Q6, Q8 and Q10) from 13 ques-

tionnaires were removed due to CVR<0.49 or CVI<0.79 (Table 1). It is noteworthy that after removing the questions (Q6, Q8 and Q10), the number of questions (Q7 to Q6) and (Q9 to Q7) and (Q11 to Q8) and (Q12 to Q9) and finally (Q13 to Q10) changes.

Table 1. Error Reporting Culture Tools

Q	Question
1	Senior managers at my hospital communicate to me that patient safety is a high priority.
2	My department/unit acts on reported information related to medical errors (near miss, incident, sentinel event) to improve patient safety.
3	Individuals are supported for reporting medical errors.
4	My department/unit places blame on individuals when an error is reported.
5	I fear there will be negative consequences associated with reporting medical errors.
6	My workload interferes with my ability to practice patient safety.
7	I feel comfortable reporting medical errors made by co-workers.
8	The medication protocols in my hospital are too complex.
9	The process of reporting errors at my hospital is cumbersome.
10	I believe that a medical error is the result of a failure of a complex system
11	New technologies, such as electronic medical records or Pyxis, are creating a safer environment for patients in my hospital.
12	New technologies available in my hospital are fully utilized to help prevent medical errors
13	I work in an environment where I can openly communicate my opinions about patient care practices.

Reliability of the tool is evaluated by calculating the Cronbach's alpha coefficient. The formula for the Cronbach's alpha coefficient is shown in Equation 3. In this equation, K is the number of questions, σ_i^2 is the variance of each question, and σ^2 is the variance of all questions. Positive correlation between items, increasing sample size and increasing the number of questions (depending on the correlation) increases the Cronbach's alpha coefficient, and the increase in the variance of the mean scales will reduce it(16-18).

$$\alpha = \frac{K}{K-1}\left(1 - \frac{\sum_{i=1}^{k} \sigma_i^2}{\sigma^2}\right) \quad (3)$$

The questionnaire was distributed to 239 nurses from both hospitals and collected. Then, the data were entered into Excel software and the SPSS software was used to calculate Cronbach's alpha coefficient of 0.732. Cronbach's Alpha coefficient is considered to be greater than 0.7 for health and social science research(1). In addition, the Kolmogorov-Smirnov test was performed to assess the normal distribution of SSICR and demographic data. The results of the test with sig>0.05 led to the rejection of the test (Table 2) And The normal distribution of SSICR data and the "age" and "work history" variables of nurses were confirmed.

To perform exploratory factor analysis using the PCA meth-

Table 2. Results of the Kolmogorov-Smirnov test

	SSICR	Age	Work History
Kolmogorov-Smirnov Z	1.312	0.98	1.328
Sig	0.064	0.292	0.059

od and varimax orthogonal rotation, Kaiser-Meyer-Olkin statistical index with 0.727 (>0.7) And Bartlett's Test of sphericity with a value of 711.341 (sig=0.000<0.05) were calculated (Table 3). A factor analysis of 211 samples was approved with a KMO index of greater than 0.7 and a significant Bartlett test. The values of factor loadings of 10 questions of the SSICR tool were calculated according to Table4. The values of which range from 0.588 to 0.874 were obtained, only Q9 has a very low load factor of 0.106, that is, it has a very weak correlation (or lack of correlation) with other questions.

The values of factor loadings of 10 questions of the SSICR tool were calculated according to Table4. The values of which range from 0.588 to 0.874 were obtained, only Q9 has a very low load factor of 0.106, that is, it has a very weak correlation (or lack of correlation) with other questions. Also, three factors in the correlation matrix were extracted (Table5). The cumulative variance was calculated to explain the variance of data of 65.2%. As shown in the Scree plot (Figure1), the factor's Egienvalue is greater than one.

Table 3. Results of reliability and exploratory factor analysis

Exploratory Factor Analysis	Cronbach's Alpha Coefficient	KMO	Bartlett's Test of S hericit			Factor Number	Cumulative Variance	Number of Questions
			Chi-Square	df	Sig			
Primary Results	0.732	0.727	711.341	45	0.000	3	65.222	10
After Q_9 Removal	0.747	0.727	706.340	36	0.000	3	71.961	9

Table 4. Factor loading of SSICR

Question	Q_1	Q_2	Q_3	Q_4	Q_5	Q_6	Q_7	Q_8	Q_9	Q_{10}
Factor Loading Values	0.705	0.737	0.683	0.637	0.676	0.647	0.874	0.872	0.106	0.588

By examining the correlation matrix values shown in Table 5, the least correlation of questions is related to Q9, with a factor load of 0.106 (Table 4) and correlation coefficients of 0.07, 0.049 and 0.314, respectively, without correlation with the first and second factors and weak correlation respectively 0.314 is the third factor that led to its removal. Then, the total Cronbach alpha coefficients (Table 3) and the three factors were calculated separately (Table 6). And questions about each factor were extracted. Then the appropriate title was assigned to each factor and the subset questions were as follows: 1-"Management Support from Patient Safety & Staff", 2-"Mental Climate of Error Reporting" And 3-"Application of New Technologies", which implies the use of new technologies to facilitate error reporting and increased safety. Also, the total Cronbach's Alpha coefficient was 0.747 and the Cronbach's alpha coefficient was 0.841, 0.733 and 0.889, respectively. By recalculating factor analysis, the cumulative variance of the three factors improved from 65.22% to 71.96%.

Table 5. Correlation matrix with varimax rotation

Question	Factor		
	1	2	3
Q_1	0.835	0.064	0.063
Q_2	0.858	0.040	0.009
Q_3	0.823	0.055	0.053
Q_4	0.054	0.790	0.101
Q_5	0.108	0.810	0.086
Q_6	0.021	0.797	0.108
Q_7	0.184	0.106	0.910
Q_8	0.155	0.104	0.915
Q_9	0.070-	0.049	0.314
Q_{10}	0.763	0.066	0.032

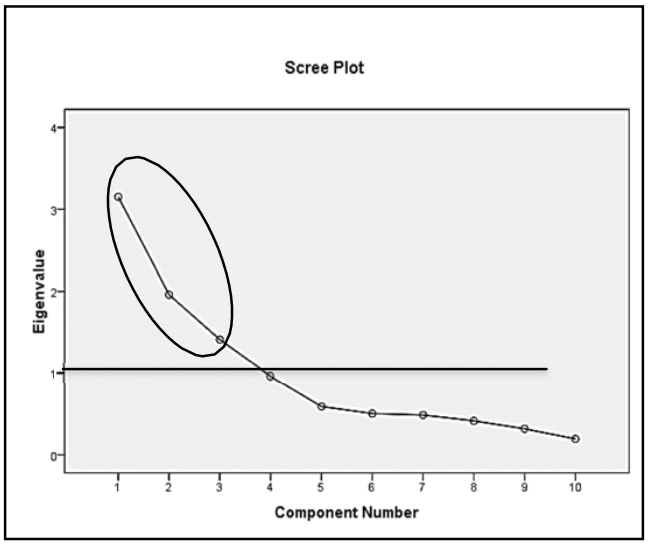

Figure 1. Scree Plot of SSICR

Table 6. Results of the subscales of error reporting culture

After Q_9 Removal	Cronbach's Alpha Coefficient	Number of Questions	Questions
Management Support from Patient Safet & Staff	0.841	4	Q_1,Q_2,Q_3,Q_{10}
Mental Climate of Error Re ortin	0 733	3	Q_4,Q_5,Q_6
A lication of New Technolo ies	0 889	2	Q_7 & Q_8

RESULTS

By examining the data, it was found that the responses of some of the demographic variables to a variety of causes, such as hospital policies, were limited to one answer, such as the "employment status" variable "all-time", the "shift" variable to "circulate," " The variable "working hours" is

"44 hours per week" and the variable "certificate" is "bachelor" for about 99% of nurses. Therefore, these variables were omitted from the analysis due to the neutrality of the analysis. Also, some of the demographic variables such as "marital status" and "job title" were encoded because of the low frequency of responses to the nominal variable.

The marital status variable, the options "never married" and "single (death, divorce & etc.)" were coded as single And In the variable "job title", the "supervisor" and "head nurse" options were coded to "managerial" and the "nurse" option to "non-managerial" And Also the quantitative variables "age" and "work history" were coded for analysis as a nominal variable in "low age" and "upper age" status, as well as "low history" and "high history" relative to their average. The frequency of the statistical population was 211, which is shown by gender in Table 7.

Table 7. Frequency of Statistical Society

Demographic variable		Nurse		Total(%)
Name	Classification	Female(%)	Male(%)	
Hospital	Amiralmomenin	71(34)	25(12)	96(46)
	Bouali	92(44)	23(10)	115(54)
employment	Official	122(58)	34(16)	156(74)
	Contractual	41(19)	14(7)	55(26)
marital status	Not married	16(8)	5(2.5)	21(10.5)
	Married	110(52)	33(15.5)	143(67.5)
	Single	1(.5)	1(.5)	2(1)
	Missing	36(17)	9(4)	45(21)
Job	Supervisor	6(3)	0(0)	6(3)
	Head nurse	11(5)	1(.5)	12(5.5)
	Nurse	146(69.2)	47(22.3)	193(91.5)
degree of education	Bachelor	162(76.7)	46(21.8)	208(98.5)
	master's degree	1(.5)	2(1)	3(1.5)
Age	<Average (36 years)	72(34)	20(9)	92(43)
	> Average	52(25)	22(11)	74(36)
	Missing	39(18)	6(3)	45(21)
Work history	<Average (12 years)	64(30.3)	24(11.4)	88(41.7)
	> Average	59(28)	17(8)	76(36)
	Missing	40(19)	7(3.3)	47(22.3)
Total(%)		163(77)	48(23)	211(100)

Table 8. Pearson Correlation Coefficients of Reporting Culture and its Subscales

Factor	Correlation Coefficients	SSICR	Factor 1	Factor 2	Factor
1	Management Support from Patient Safety & Staff Sig	0 699 0.000	1		
2	Mental Climate of Error Reporting Sig	0.710 0.000	0.148 0.032	1	
3	New technologies application Sig	0.635 0 000	0.223 0 001	0.242 0 000	1

The Pearson correlation coefficients of the subscales were calculated than the error reporting culture (Table 8). And The 2nd factor with the highest correlation of 0.710 and 3rd factor with the lowest correlation of 0.635 was determined. Also, the correlation between the three factors was very weak (in other words, without correlation) and below 0.3, indicating that the factors are independent of each other. The variables "marital status", age and "work history" are not answered in some 211 samples, in other words, they have missing data (Table 7).

Table 9. Error Reporting Culture Status and its Subscales

Variable	Mean	Standard Deviation	Max	Min	Status
Management Support from Patient Safety & Staff	2.938	0.571	4.000	1.000	favorable
Mental Climate of Error Reporting	2.259	0.767	4.000	1.000	Undesirable
New technologies application	2.767	0.826	4.000	1.000	favorable
Error Reporting Culture	2.674	0.475	4.000	1.222	favorable

Table 10. Pearson correlation coefficients of age and work history variables

Correlation Coefficient	Age	Work history
SSICR	0.009	0.013
sig	0.907	0.870
N	166	164

Also, Pearson correlation coefficients of demographic variables, age, and work history were calculated as 0.009 and 0.013 with a significant level of sig>0.05 respectively (Table 10) and their lack of relevance to the reporting culture was also proved. Then, Chi-square Pearson's test was performed to examine the relationship between the non-demographic and employment demographics and gender, as well as the encoded variables "job title" and "marital status" with the error-reporting culture without considering the effects of variables on each other. In the following, with multiple logistic regression tests, the effects of variables in a more realistic environment were predicted. The non-parametric test of chi-square Pearson was performed for the two coded "age status" and "work history" variables. The values of chi-square and significant levels were calculated 0.096 with sig=0.757 and 0.433 with sig=0.510 And The relationship between the two coded variables with the error-reporting culture was also rejected.

Due to the prevention of multicolinearity and the increase in the error of the logistic regression model, the simultaneous entry of age variables and "work history" due to a high correlation of 0.9 (0.939 and sig=0.000) was refused. Finally, due to the fact that in some samples, "missing data" and had a significant effect on reducing the number of logistic regression samples, both variables were discarded. At first, employment variables and gender, as well as coded variables "job title" and "marital status" were entered into the model. The results of the Omnibus test were calculated to be 7.221 (sig=0.125), with no significance test (sig>0.05), the fit was not acceptable because it did not explain the input of the variables and did not improve our prediction.

In the following, due to the failure to prove the relationship

between the variable "marital status" and the error-reporting culture in the nonparametric chi-square test (Table 11) and also "missing data" in some samples, which led to a decrease in the volume of the test samples, the variable " Marital Status "was removed from the model. Then, by re-calculating the Omnibus test, chi-square was 7.712 (sig=0.052), which did not fit the model, although the level of significance was lower than the previous one. Finally, after examination the employment variables and the "job title" in the model, with the removal of the variable "job title" and re-calculation of the Omnibus test, the chi-square was 7.681 (sig=0.021<0.05) and the fit of the model was acceptable and entering the variables into the model improved the prediction of the model.
Also, Cox and Snell coefficient equaled 0.036 and Nagelkerke coefficients equaled 0.049, indicating the range of variations (percentages) in this distance. The Homsmer & Lemeshow test with chi-square equal to 0.008 (sig=0.996>0.05) indicates that the expected values (prediction) are accord with the observations. Finally, the prediction accuracy before entering the variables in the "zero block" was 64.9, which was improved after entering the variables in "one block" to 65.9. The values of the odds of the model are shown in Table 11 that the values of the gender variable with the odds of 2.536 (sig=0.006<0.05) with confidence intervals (CI:1.313 to 4.901) and the relatively high value of the wald statistic of 7.672 merely indicates a positive relationship Gender variable with reporting culture variable.

Table 11. Chi-square nonparametric test results and multiple logistic regression

Variable	Chi-Square Test			Multiple Logistic Regression			
	Chi-Square	df	Sig	Odds	Sig	0.95%Ci*	Wald
Employment (1)	0.009	1	0.924	0.933	0.836	0.482-1.804	0.043
Sex (1)	7.897	1	0.005	2.536	0.006	1.313-4.901	7.672
Job Title (1)	0.026	1	0.872	Sig of Omnibus Test >0.05			
Marital Status (1)	1.833	1	0.176				
Age Status	0.096	1	0.757	-			
Work History Status	0.433	1	0.5	-			

*Confidence Interval

Of course, the examinations showed that by removing the employment variable instead of the "job title" and eliminating both variables simultaneously, there was no change in the final results and the significance (sig <0.05) of the Omnibus test (with values sig=0.022 & sig=0.006) and the fitting of the model was also confirmed in these two modes. The odds ratios of the gender variable with very little difference compared to the final status of 2.536 were 2.552 and 2.529, respectively, with the same sig=0.006 And Also, the values of wald statistics were 7.642 and 7.640, respectively, with very little difference compared to the final condition of 7.672. The values of the Cox & Snell and Nagelkerke coefficients were similar in both cases.

DISCUSSION

After performing the face validity of the tool with 13 questions, they were translated from English into Persian and then by the content validity of the tool, 3 other questions were deleted due to 0.79> CVI or 0.49> CVR. Finally, by performing construct validity and reliability of the tool, 1 other query was deleted due to poor correlation and low factor loading of 0.106 And three subsamples with 9 questions were determined for error reporting culture tools.
Then, by computing descriptive statistics, the medical error reporting culture was evaluated in two subscales "Management Support from Patient Safety & Staff" and " New Technologies Application " with an average of 2.938 and 2.767 desirable And in the subscale of "Mental Climate of Error Reporting" with the highest correlation of 0.710 and an average of 2.259 was also undesirable. Finally, the culture of error reporting in hospitals was favorable with an average of 2.674 and a standard deviation of 0.475 And the positive relationship between error reporting culture and demographic variable of gender when female nurses were compared to male nurses with a chance level of 2.536, a significant level of 0.006 and a confidence interval of 4.901 to 1.313, and the lack of correlation of error reporting culture with other demographic characteristics was confirmed.
The advantage of this study is to provide a tool with appropriate subscales for measuring the error reporting culture. According to the search of Persian articles about the error reporting culture, this article may be considered as one of the first studies or perhaps the first study to Provides an appropriate tool for measuring the error reporting culture in Persian. Very few studies have been conducted on the error reporting culture, and most studies are in the field of error reporting or safety culture and have not been directly addressed to the culture of error reporting.
In a study (2016) conducted at governmental hospitals in Pakistan with the participation of 309 nurses on nurse perceptions of organizational culture and its association with the culture of error reporting, respondents ranked the error reporting culture unfavorably And the reasons are as follows qualitatively, The lack of comprehensive medical regulations in the country to protect patients or physicians and nurses, The existence of a blame culture with punitive measures that prevents the sharing of errors And the unwillingness to report errors in female nurses due to fear of violence, punishment and patriarchy in the workplace. In this study, the error reporting culture was generally ranked, but in the current study, there are 3 subsamples and sections(1). An Iranian study (2016) on nursing error reporting barriers was conducted at the intensive care unit in Kurdistan province with the participation of 16 employed nurses. the findings showed that, Supporting nurses and their security and discovering the cause of an error is essential and managers should be encouraged by nurses with personal, professional

and legal support to effectively report on them, to discover the underlying causes and measures to prevent errors. Although this qualitative study and sample size is much lower than the present study, its results confirm the results of this study(19).

A study (2018) on the low level of medication error reporting and smartphone usage has been conducted for 2 months among 334 physicians and pharmacists in Malaysian public health centers. Doctors and pharmacists were aware of the medication error reporting system and were willing to report when faced with an error. But due to the busy and hectic work environment, only less than half of respondents have used this system. In this study, the use of smartphones as new technologies has confirmed the results of present study(20). According to the results of the comparison of the present study with other studies that are reliable sources, it seems that the validity and reliability of the measurement tool of the present study have been carefully considered. It can also be used as an appropriate tool for evaluating the error reporting culture. Finally, Regarding the lack of complete registration of the identity of individuals in some of the questionnaires, it is possible to explain the cultural and customary reasons of the Iranian society for the issues of divorce, unmarried and the sensitivity of individuals to declaring their age, as well as fears and concerns of individuals about the possibility of identifying their characteristics.

CONCLUSION

Despite the development and improvement of the hospital safety culture, which has been implemented in various health programs in recent years, the error reporting culture has improved as part of a safety culture. However, the mental climate that governs the reporting of errors by nurses is undesirable and requires essential steps to reduce fear, concern and negative consequences after reporting of errors, especially in nurses And the presence of female nurses in comparison with male nurses improves the error reporting culture. Perhaps one of the main reasons is the existence of patriarchy in the culture of the family and the Iranian community, but this needs to be further explored.

ACNOWLEDGMENTS

This article has been extracted from a part of the master's dissertation with the code 13610706952006 on Health Services Management written by Mrs Sima Safarzadeh in Faculty of Health of Tehran Medical Sciences of Islamic Azad University.

AUTHOR CONTRIBUTION

All authors contributed to this project and article equally. All authors read and approved the final manuscript.

CONFLICT OF INTEREST

The authors have no conflicts of interests to declare.

ETHICAL STANDARDS

The published research is compliant with the guidelines for human studies regulations.

REFERENCES

1. Jafree SR, Zakar R, Zakar MZ, Fischer F. Nurse perceptions of organizational culture and its association with the culture of error reporting: a case of public sector hospitals in Pakistan. BMC Health Services Research. 2016;16(1):13. Epub 2016/01/06. doi: 10.1186/s12913-015-1252-y. PubMed PMID: 26728071; PubMed Central PMCID: PMC4700678.

2. Zaboli R, Abbaszade A, Shahabinejad M. Assessing the barriers of error reporting from perspective of nurses in Kerman hospitals. Medical Ethics Journal. 2016;10(34):23. Epub 2016-01-01.

3. World Health Organization. 10 facts on patient safety 2018 [updated 2018 March]. Available from: http://www.who.int/features/factfiles/patient_safety/en/.

4. Hughes RG. Advances in Patient Safety Nurses at the "Sharp End" of Patient Care. In: Hughes RG, editor. Patient Safety and Quality: An Evidence-Based Handbook for Nurses. Rockville (MD): Agency for Healthcare Research and Quality (US); 2008. p. 30.

5. Alsafi E, Baharoon S, Ahmed A, Al-Jahdali HH, Al Zahrani S, Al Sayyari A. Physicians' knowledge and practice towards medical error reporting: a cross-sectional hospital-based study in Saudi Arabia. Eastern Mediterranean Health Journal(EMHJ). 2015;21(9):655-64. Epub 2015/10/10. PubMed PMID: 26450862.

6. Hwang JI, Ahn J. Teamwork and clinical error reporting among nurses in Korean hospitals. Asian nursing research. 2015;9(1):14-20. Epub 2015/04/02. doi: 10.1016/j.anr.2014.09.002. PubMed PMID: 25829205.

7. Soodabeh J, Mahboobeh S, Abbas H, Sara R, Hamid HJM-SNJ. The relationship between medication errors and nurses' work environment. Medical-Surgical Nursing Journal. 2016;4(4):27-34.

8. Gu X, Itoh K, editors. Estimating reporting culture and its link to safety performance by applying hemodialysis error taxonomy. Industrial Engineering and Engineering Management (IEEM), 2013 IEEE International Conference on; 2013; Bangkok, Thailand: IEEE; 2014.

9. Feng X, Bobay K, Weiss M. Patient safety culture in nursing: a dimensional concept analysis. Journal of advanced nursing. 2008;63(3):310-9. Epub 2008/08/16. doi: 10.1111/j.1365-2648.2008.04728.x. PubMed PMID: 18702778.

10. Kagan I, Barnoy S. Organizational safety culture and medical error reporting by Israeli nurses. Journal of nursing scholarship : an official publication of Sigma Theta Tau International Honor Society of Nursing. 2013;45(3):273-80. Epub 2013/04/12. doi: 10.1111/jnu.12026. PubMed PMID: 23574516.

11. Abiri O. Differences in Nurses' Perceptions of Safety Culture, Nurse-Physician Collaboration, and Level of Job Satisfaction Related to the Type of Obstetrical Physician Service Delivery Model Utilized. Boca Raton, Fla.: Florida Atlantic University; 2017.

12. American Hospital Association(AHA) HRET, and the Institute for Safe Medication Practices (ISMP). The Pathways for Medication Safety:Leading a Strategic Planning Effort 2002 [11/20/2002]. Available from: https://www.ismp.org/sites/default/files/attachments/2017-11/PathwaySection1-Leadership.pdf.

13. The Australian Commission on Safety and Quality in Health Care. MEASUREMENT FOR IMPROVEMENT TOOLKIT-Final Draft Melbourne: Clinical Epidemology & Health Service Evaluation Unit Melbourne Health; 2005 [updated January 23, 2012; cited 2005 30 September]. Available from: https://www.safetyandquality.gov.au/former-publications/measurement-for-improvement-toolkit-final-draft-pdf-2057-kb/.

14. Moghri J, Arab M, Saari AA, Nateqi E, Forooshani AR, Ghiasvand H, et al. The Psychometric Properties of the Farsi Version of "Hospital Survey on Patient Safety Culture" In Iran's Hospitals. Iranian journal of public health. 2012;41(4):80-6. Epub 2012/11/01. PubMed PMID: 23113168; PubMed Central PMCID: PMC3481614.

15. Lawshe C. A quantitative approach to content validity. Personnel Psychology. 1975;28:563–75.

16. Bland JM, Altman DG. Cronbach's alpha. BMJ (Clinical research ed). 1997;314(7080):572. Epub 1997/02/22. PubMed PMID: 9055718; PubMed Central PMCID: PMC2126061.

17. Cronbach LJ. Coefficient alpha and the internal structure of tests. psychometrika. 1951;16(3):297-334.

18. Tavakol M, Dennick R. Making sense of Cronbach's alpha. International journal of medical education. 2011;2:53-5. Epub 2011/06/27. doi: 10.5116/ijme.4dfb.8dfd. PubMed PMID: 28029643; PubMed Central PMCID: PMC4205511.

19. Peyrovi H, Nikbakht Nasrabadi A, Valiee S. Exploration of the barriers of reporting nursing errors in intensive care units: A qualitative study. Journal of the Intensive Care Society. 2016;17(3):215-21. Epub 2016/08/01. doi: 10.1177/1751143716638370. PubMed PMID: 28979494; PubMed Central PMCID: PMC5606520.

20. George D, Hss AS, Hassali A. Medication Error Reporting: Underreporting and Acceptability of Smartphone Application for Reporting among Health Care Professionals in Perak, Malaysia. Cureus. 2018;10(6):e2746. Epub 2018/08/09. doi: 10.7759/cureus.2746. PubMed PMID: 30087822; PubMed Central PMCID: PMC6075636.