

Prevalence of non-reporting of hospital medical errors in the Islamic Republic of Iran

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Abstract

Background: Medical errors frequently occur in health care facilities, jeopardizing patient safety and increasing associated costs.

Aims: This cross-sectional investigation examined the rates of and reasons for non-reporting of medical errors at Nema-zee Hospital, Shiraz, Islamic Republic of Iran.

Methods: Self-administered questionnaires were completed by 283 staff members, including physicians, nurses and medical students. One-way analysis of variance, Fisher's least significant difference post hoc, Spearman correlation coefficient and intraclass correlation tests were used for statistical analyses.

Results: Almost all (95.8%) participants had observed at least 1 medical error during the previous year, with over half (50.5%) observing 3–10 errors. The preferred method for reporting medical errors among physicians and medical students was verbal and informal (40.3% and 41.8% respectively), while nurses preferred written forms (45.7%). The results indicated significant differences between groups concerning individual and organizational barriers in general, and among all sub-categories ($P < 0.001$).

Conclusion: Concerns of legal entanglements and confidentiality issues were recognized as the main barriers to reporting medical errors.

Keywords: medical errors, non-reporting, patient safety, hospitals, health care workers

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Introduction

More than 16 years after the landmark report by the Institute of Medicine, serious concerns about patient safety continue to exist (1–3). Medical errors are estimated to be the third leading cause of death in the United States of America (4). There have been 4 major studies conducted since the Institute of Medicine study concerning deaths associated with medical errors. Together they cover over 37 million patient admissions with a 3.1% rate of adverse events and a 0.7% mortality rate (5–7).

Efficiency, security of care, care giver reactivity and patient contentment are safety parameters that are at the core of health care quality (3). The most crucial factor, however, is a comprehensive understanding of medical errors (8). Gathering meticulous evidence via transparent incident reporting, free sharing of data and the creation of a culture of learning from our mistakes are indispensable in the development of medical error reduction plans and improving patient safety (2,5,9). The backbone of the movement towards an enhanced culture of safety is a well-organized error reporting system (10).

A survey in 6 South Australian hospitals reported that even though 98.3% of respondents were aware of their facility's incident reporting systems, more than 40% had never filed a report (11). Another study reported 84.3% of 338 internal medicine physicians and residents believed that reporting medical errors improved quality. However, their rate for reporting minor errors was only 16.9% and for major errors 3.8% (12). Understanding the multiple factors that influence reporting errors among health care workers is crucial to supplying missing elements of an effective communication programme. Such barriers can damage the transparency of a safety climate and a culture of learning from errors (8,13,14).

A perfectionist belief is that only poor physicians make mistakes (2,13). Several studies indicate that there is a lack of knowledge concerning reportable incidences. Many physicians and nurses often do not consider near misses and medication omissions as being reportable (2). In one study, 25% of participants did not know how to retrieve their facility's incident reporting form (11).

At the institutional level, the safety climate often determines front-line provider attitudes (13). Loss of

malpractice insurance coverage, fear of punitive actions, time constraints, poorly designed reporting systems, negative feedback, lack of confidentiality and a power hierarchy within professional groups are factors that negatively affect error reporting (2,8,13,14). Other factors can be even more specific, such as fear of disciplinary action and threats to positive evaluations and promotion, especially among nurses (2,13,15).

In a study of 20 hospitals in the north of the Islamic Republic of Iran, 182 (0.06% of 317 966 admissions) medical errors were reported. The lack of a reliable reporting system, negative attitudes toward reporting among staff and managers and a punitive culture were mentioned as the potential causes (16). The rate of non-reporting was estimated at 78.9% within the nursing staff of a teaching hospital in Kermanshah (17). There were comparable results in 2 other independent surveys among nurses at Imam Khomeini Hospital in Tehran (18,19).

Barriers to medical error reporting were investigated among health care providers in the Islamic Republic of Iran in 2012. The study reported a high incidence of mishaps with lower rates of reporting (< 50%). The absence of an effective medical error reporting system, an insufficient supporting atmosphere among peers, lack of sufficient knowledge regarding the importance of error reporting and fear of malpractice litigation were listed as the most common impediments (20).

In the summer of 2014, a web-based error reporting system was launched at Nemazee Hospital in Shiraz. Reporting forms were revised and multiple training courses presented. Following these efforts, error reports increased by approximately 2000 cases per month. However, topical specialists felt that there was still room for improvement. Also, there was a strong need to compare the effectiveness of the Nemazee Hospital programme with others currently operating in the Islamic Republic of Iran. Therefore, the aims of this study were to determine the reasons behind non-reporting by hospital staff physicians, nurses and medical students and how well the facility error reporting is actually operating.

Methods

Study setting

We conducted a cross-sectional descriptive study from September–December 2015 in Nemazee Hospital, Shiraz, Islamic Republic of Iran. The facility is a general, specialty and subspecialty teaching hospital with 750 beds and is considered as the main referral centre in the south of the country.

Questionnaires

Data were collected from 283 participants (82% response rate), including physicians, nurses and medical students using a self-administered questionnaire. Samples were selected with a confidence level of 95%, standard deviation 2 (score of barriers against error reporting based on

a pilot study), precision of 0.25, population of 2000 and considering withdrawal proportion of 25%.

The study population was selected randomly from available personnel in all 32 wards in the hospital and during all shifts. Questionnaires were presented in written form and completed immediately during a break in the shift and took 10 minutes on average. The questionnaire used in this study was developed by a hospital study group. A group of topical experts then assessed the questionnaire for content validity. The questionnaire was piloted on 19 medical students and 17 nurses in the study group. Cronbach's alpha calculation was used to assess reliability. The resulting value was 0.819.

The first section of the questionnaire covered demographic characteristics, including sex, work experience and department. The second section contained questions about participant knowledge concerning medical errors, past in-service training, number of witnessed errors during the previous year, preferred method for reporting errors and response to medical errors committed, either by themselves or their peers.

Barriers to medical error reporting were assessed through 13 statements involving personal and organizational opinions and behaviours. Participants reported their level of agreement using a scale of 1–10. Unfamiliarity with medical errors or the reporting process, fear of punishment, cultural issues within a group, lack of confidentiality, a time-consuming reporting system, lack of proper feedback and fear of malpractice lawsuits were considered as organizational factors. There were 4 additional questions that addressed respondent knowledge about medical errors.

Statistical analyses

Analysis included descriptive analysis, 1-way analysis of variance, Fisher's least significant difference post hoc, intra-class correlation (ICC) test. SPSS, version 23, was used. *P*-value < 0.05 was considered significant.

Ethical considerations

The protocol of this study was approved by the Shiraz University of Medical Sciences research ethics committee (IR.SUMS.MED.REC.1394.S01). Participation was voluntary.

Results

Participants included 151 nurses (53.3%), 77 physicians (27.2%) and 55 medical students (19.4%). The largest group of participants [53 nurses (35.1%), 41 physicians (53.2%) and 23 medical students (41.8%)] worked in internal medicine units; 62 nurses (41.1%) and 31 physicians (40.2%) had less than 5 years of work experience. Witnessing at least 1 error during the previous year was reported by 271 (95.5%) respondents. More than half (143, 50.5%) had observed 3–10 medical errors in the previous year (Table 1).

Table 1 Distribution of observed medical errors among physicians, nurses and medical students (n = 283) during 2015 in Nemazee Hospital, Shiraz, Islamic Republic of Iran

Occupation	No. of times seen			
	Not seen (%)	1–2 (%)	3–10 (%)	> 10 (%)
Physician	1.3	23.4	54.5	20.8
Nurse	7.3	31.1	45.0	16.6
Medical student	0.0	20.0	60.0	20.0
Total	4.2	26.9	50.5	18.4

Physicians (n = 31, 40.3%) and medical students (n = 23, 41.8%) preferred to report errors via a telephone call or in person to a supervisor. However, nurses favoured using written forms to report an error (n = 69, 45.7%).

Among physicians, 32 (41.6%) stated that “they would report only themselves, believing reporting superiors would be considered offensive.” Among nurses, 54 (35.8%) believed that “It is mandatory to report all witnessed errors to a supervisor”. The largest group of medical students (n = 21, 38.2%) indicated that “It is mandatory to disclose if the committed error is significant (e.g. vitally important)”.

Knowing the person making an error would not influence the decision to report for 38 physicians (49.4%), 120 nurses (79.5%) and 31 medical students (56.4%). To measure agreement of actual information level and the self-perception of participants, we calculated group ICC indices: most correlations were weak. The degree of consistency among physicians (ICC = 0.06) was less than for nurses (ICC = 0.39) and medical students (ICC = 0.38).

The questionnaire also assessed the impact that hospital-provided medical error training courses had on

study participants; 55 physicians (71.4%) and 24 medical students (43.6%) reported having no or inadequate training on errors (n = 59, 76.6%) and error reporting (n = 39, 70.9%). Conversely, most nurses reported that they had received adequate training on error identification (n = 89, 58.9%) and error reporting (n = 98, 64.9%).

The second part of the questionnaire contained 13 statements regarding possible obstacles to error reporting. The analysis of variance test indicated significant differences between groups concerning individual barriers in general and among all sub-categories, with nurses having the highest mean score for all categories (Table 2). The least significant difference post-hoc analysis showed statistically significant differences between nurses and physicians (P < 0.001) and nurses and medical students (P < 0.001). Similarly, significant differences existed among the 3 study groups concerning organizational barriers in general and among all sub-categories (again, nurses had the highest mean score in each category) (Table 3).

Barriers most often mentioned by physicians were “Worrying about the revelation of a colleague’s identity”,

Table 2 Score distribution for individual barriers to error reporting among physicians, nurses and medical students (n = 283) in Nemazee Hospital, Shiraz, Islamic Republic of Iran, 2015

Barrier	Mean (range 0–5)	SD	P-value
Individual (overall)			
Physicians	1.8	0.4	< 0.001
Nurses	3.6	1.7	
Medical students	1.9	0.3	
Unfamiliarity with medical error/reporting process			
Physicians	1.7	0.5	< 0.001
Nurses	3.1	1.9	
Medical students	1.8	0.5	
Fear of punishment			
Physicians	2.1	0.7	< 0.001
Nurses	4.6	3.0	
Medical students	2.3	0.6	
Cultural issues			
Physicians	1.6	0.5	< 0.001
Nurses	3.2	1.9	
Medical students	1.5	0.4	

P-value is estimated based on 1-way analysis of variance test.
SD = standard deviation.

Table 3 Score distribution of organizational barriers against error reporting among physicians, nurses and medical students (n = 283) in Nemazee Hospital, Shiraz, Islamic Republic of Iran, 2015

Barrier	Mean	SD	P- value
Organizational (overall)			
Physicians	2.1	0.5	< 0.001
Nurses	4.4	2.2	
Medical students	2.1	0.4	
No confidentiality			
Physicians	2.0	0.7	< 0.001
Nurses	4.1	3.1	
Medical students	2.0	0.7	
Time consuming reporting system			
Physicians	2.0	0.8	< 0.001
Nurses	4.3	3.1	
Medical students	1.9	0.8	
Lack of proper feedback			
Physicians	2.2	0.8	< 0.001
Nurses	4.5	2.2	
Medical students	2.2	0.7	
Fear of malpractice lawsuit			
Physicians	2.2	0.8	< 0.001
Nurses	4.7	3.4	
Medical students	2.2	0.7	

P-value is estimated based on 1-way analysis of variance test.

SD = standard deviation.

“Fear of a malpractice lawsuit” and “An inefficient error reporting system”. The top issue for nurses and medical students was “Worry about being criticized by peers or supervisors” (Table 4).

Discussion

Medical errors remain a serious health concern worldwide and require special attention by health care administrators and policy-makers (5,10). Health care providers are often reluctant to report patient safety problems, which could jeopardize proper medical error reporting (13). This study was designed to assess the main impediments against error reporting among physicians, nurses and medical students in Nemazee Hospital.

We found that almost 96% of respondents had observed an error at least once during the previous year. This agrees with an American study in which 94% of physicians and 88.7% of other health care workers witnessed one or more medical errors in their department (12). The majority (98%) of anaesthetists who participated in a similar study conducted in Switzerland disclosed being involved with a medical error (7).

As in other studies, we found that nurses were more inclined to report medical errors than were physicians and students. Physicians perceived more barriers against proper reporting (21,22). One study indicated that only 42% of physicians routinely reported medical errors (23). Conversely, the findings of a Saudi Arabian study

suggested physicians were more likely to report major medical errors than other health care workers (9). Our findings are comparable to surveys in that demographic characteristics, especially work experience and assigned wards among nurses, did not influence medical error reporting (13).

The informal reporting style of physicians has been noted in other studies (9,14). Nurses favoured more formal reporting schemes for all types of errors. All 3 of our groups indicated their rate of reporting was the same if the error was theirs or that of a colleague. However, Alsafi et al. indicated that almost one-third of physicians would not report a peer to preserve their relationship (9).

In our study, the ranking of barriers was different between the groups. Fear of legal complaints, reproach, punishment, lack of positive feedback, concern for endangering a colleague's occupational status or revelation of his/her identity were often reported. In contrast, items such as “Errors are unavoidable in medical practice” and “There was nothing serious to report” received the lowest scores. However, a study from Australia reported conflicting results (24).

Fear of legal consequences was among the top reasons for non-reporting by physicians, nurses and medical students. Legal repercussions have been recognized as one of the most pervasive obstacles to open communication (25,26). A study of 733 nurses in Urmia, Islamic Republic of Iran, indicated that reproach and penalties were the most cited obstacles to proper reporting (26). A survey among

Table 4 Barriers against error reporting among physicians, nurses and medical students (n = 283) in Nemazee Hospital, Shiraz, Islamic Republic of Iran, 2015

Items	Physicians	Nurses	Medical students	P-value
	Mean (SD)	Mean (SD)	Mean (SD)	
Not familiar with reportable issues	1.77 (0.74)	2.99 (2.67)	1.85 (0.7)	< 0.001
Not familiar with error reporting ways	1.96 (0.79)	2.69 (2.64)	2.15 (0.8)	0.023
Worry about my identity revelation	1.95 (0.84)	3.70 (3.15)	1.82 (0.7)	< 0.001
Worry about revelation of colleague's identity	2.50 (0.81)	4.47 (3.42)	2.18 (0.61)	< 0.001
It is a time-consuming process	2.00 (0.78)	4.34 (3.14)	1.93 (0.77)	< 0.001
Fear of malpractice lawsuit	2.18 (0.84)	4.69 (3.36)	2.16 (0.69)	< 0.001
Fear of penalty or job loss	2.13 (0.80)	4.43 (3.16)	2.27 (0.71)	< 0.001
Worry about being criticized by peers or supervisor	2.03 (0.78)	4.73 (3.32)	2.33 (0.67)	< 0.001
There was nothing serious to report	1.42 (0.59)	3.58 (3.06)	1.44 (0.57)	< 0.001
Error reporting is not efficient	2.16 (0.80)	4.52 (3.25)	2.22 (0.74)	< 0.001
Come on! Who wants to do such things?	1.70 (0.73)	3.08 (2.74)	1.64 (0.7)	< 0.001
Error reporting is not a usual concern	1.81 (0.74)	3.62 (2.77)	1.62 (0.68)	< 0.001
Error is unavoidable in medical practice	1.40 (0.61)	2.86 (2.61)	1.22 (0.50)	< 0.001

SD = standard deviation.

nurses from hospitals affiliated with Tehran and Shiraz universities of medical sciences listed fear of legal action, job threats and a negative culture of blame as major impediments (27). However, some studies, including one from the Netherlands, indicated that fear of legal complaints was not a significant concern for internists and residents reporting medical errors (8,28).

Research carried out in the United States of America revealed that when anonymous reporting was established, nurses reported both minor and major medical errors at higher rates (29). In a Saudi Arabian study, 60% of physicians noted that reporting would be easier when there was a heightened level of confidentiality (9). Fear of being identified was not a major concern in our study, however, it was listed as one of the most discouraging factors concerning medical error reporting.

Time consumption was not a top-ranked factor against proper medical error in our study nor in another from the Islamic Republic of Iran (26). More than 50% of Australian physicians and 40% of nurses felt their cumbersome reporting system was an important barrier (30). A Swiss cross-sectional survey involving anaesthetists reported not only sluggish reporting systems, but also inadequate feedback and lack of information negatively affected error reporting (8). Polisen et al. determined that more than half of the physicians and nurses surveyed believed their reporting system was incompetent and that they failed to receive plausible and timely feedback (30). Our study showed comparable results, which indicated that ineffectiveness of the error reporting system was among the top 3 causes of non-reporting by physicians, nurses and medical students.

The World Health Organization published a guideline for medical students in 2009 which included 11 topics on patient safety (31). A number of studies indicate that most medical students receive little information about medical errors or reporting techniques (32,33), and staff physicians

and nurses do not receive adequate information (8). Throckmorton et al. showed nurses could not identify errors in 40% of cases (29), although no practical scenario was provided for the accurate assessment of medical error recognition and understanding in this study, and there was evidence that 73.5% of nurses and almost half of physicians and medical students had an inadequate background on the topic.

Significant limitations of this study included voluntary participation, self-reporting of information and possible recall bias. Some participants might not have recalled their errors very well. This could result in underestimation of the actual rate of reported medical errors. Also, correlation measurements between causes of non-reporting and job titles of nurses, including supervisory, was not possible due to the limited number of supervisors and head nurses among our participants. Possible future studies could involve greater numbers of participants and other types of health care workers. Applying our questionnaire in other hospitals could also be worthwhile. It would be valuable if hospitals of various sizes were involved.

Conclusions

Concerns about legal entanglements, reporting methodology and confidentiality issues were recognized as the main barriers to reporting medical errors in Nemazee Hospital. Nurses did report errors at higher rates and they were found to prefer more formal, extensive, written reporting forms and the inclusion of all types of errors. Physicians and medical students preferred the opposite. Furthermore, the lack of knowledge on identifying and reporting medical errors among physicians and medical students requires attention by hospital administrators. It appears that a formal reintroduction of the reporting system with accompanying in-service training is needed.

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Prévalence de la non-notification des erreurs médicales en milieu hospitalier en République islamique d'Iran

Résumé

Contexte : Les erreurs médicales sont fréquentes dans les établissements de soins, ce qui a pour effet de mettre en péril la sécurité des patients et d'augmenter les coûts associés.

Objectifs : La présente étude transversale avait pour objectif d'examiner les taux et les raisons de la non-notification des erreurs médicales à l'hôpital de Nemazee, à Chiraz en République islamique d'Iran.

Méthodes : Des questionnaires auto-administrés ont été remplis par 283 membres du personnel, parmi lesquels des médecins, des membres du personnel infirmier et des étudiants en médecine. Une analyse de variance à sens unique, le test post hoc de la différence la moins significative de Fisher, le coefficient de corrélation de Spearman et les tests de corrélation intraclasse ont été utilisés pour les analyses statistiques.

Résultats : La quasi-totalité des participants (95,8 %) avait observé au moins une erreur médicale au cours de l'année précédente, plus de la moitié (50,5 %) ayant relevé entre 3 et 10 erreurs. Pour signaler les erreurs médicales, les médecins et les étudiants en médecine privilégiaient la méthode verbale et informelle (40,3 % et 41,8 % respectivement), tandis que le personnel infirmier préférait les formulaires écrits (45,7 %). Les résultats indiquent des différences significatives entre les groupes concernant les obstacles individuels et organisationnels en général, et entre toutes les sous-catégories ($p < 0,001$).

Conclusion : L'étude a montré que la complexité juridique et les problèmes de confidentialité constituaient les principaux obstacles à la notification des erreurs médicales.

معدل انتشار عدم الإبلاغ عن الأخطاء الطبية في المستشفيات في جمهورية إيران الإسلامية

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الخلاصة

الخلفية: كثيراً ما تقع الأخطاء الطبية في مرافق الرعاية الصحية، مما يعرض سلامة المرضى للخطر، ويزيد من التكاليف المرتبطة بذلك.

الأهداف: هدف هذا الاستقصاء المقطعي إلى بحث معدلات عدم الإبلاغ عن الأخطاء الطبية في مستشفى نمازي في مدينة شيراز بجمهورية إيران الإسلامية، وأسباب ذلك.

طرق البحث: استكمل 283 موظفاً الاستبيانات ذاتياً، من بينهم أطباء وممرضات أو ممرضون وطلاب في الكليات الطبية. واستخدم التحليل أحادي الاتجاه للفروق، واختبار فيشر البعدي لأقل فرق معنوي، واختبار معامل سبيرمان للترابط، واختبار معامل الترابط داخل الفئة، لأغراض التحليلات الإحصائية.

النتائج: لاحظ جميع المشاركين تقريباً (95.8%) خطأً طبيًا واحدًا على الأقل خلال العام السابق، ولاحظ أكثر من نصفهم (50.5%) حدوث 3-10 أخطاء. وكانت الطريقة المفضلة لدى الأطباء وطلاب الكليات الطبية للإبلاغ عن الأخطاء الطبية هي الطريقة الشفوية وغير الرسمية (40.3% و41.8% على التوالي)، في حين فضل الممرضون والممرضات النماذج المكتوبة (45.7%). وأشارت النتائج إلى وجود اختلافات كبيرة بين المجموعات فيما يتعلق بالحواجز الفردية والتنظيمية بصفة عامة، وبين جميع الفئات الفرعية ($P < 0.001$).

الاستنتاجات: ثبت أن الشواغل المتعلقة بالتشابكات القانونية وقضايا السرية هي العقبات الرئيسية التي تعترض الإبلاغ عن الأخطاء الطبية.

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