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Abstract

Background: Medical errors frequently occur in healthcare 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 Nemazee 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 (ANOVA), Fisher’s Least Significant Difference (LSD) post hoc, Spearman Correlation Coefficient and Intra Class Correlation (ICC) tests were used for statistical analyses.

Results: Almost all (95.8%) of participants had observed at least one medical error during the previous year. Over half (50.5%) had observed three to ten medical errors in the last year. 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 main barriers to reporting medical errors.

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


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Introduction

More than 16 years after the landmark report by the Institute of Medicine (IOM), 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 four major studies conducted since the IOM study concerning deaths associated with medical errors. Together they include 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, caregiver reactivity and patient contentment are safety parameters that are at the core of healthcare 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 toward an enhanced culture of safety is a well-organized error reporting system (10).

A survey in six 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 increased quality. However, their rate for reporting minor errors was only 16.9% and 3.8% for the major errors (12). Understanding the multiple factors that influence reporting errors among healthcare 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 article, 25% of participants did not know how to retrieve their facility’s incident reporting form (11).

On the institutional level, the safety climate often determines frontline 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. A lack of a reliable reporting system, negative attitude toward reporting amid staff and managers and 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 two other independent surveys among nurses at Imam Khomeini Hospital, Tehran (19,20).

Barriers to medical error reporting were investigated among healthcare 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, insufficient supporting atmosphere among peers, lack of sufficient knowledge concerning the importance of error reporting and fear of malpractice litigation were listed as the most common impediments (10).

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. 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**

We conducted a cross-sectional descriptive study during 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 center in the south of the country.

**Questionnaires**

Data were collected from 283 participants 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 different hospital units during all working shifts. Questionnaires were presented in written form and completed immediately. 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 using 19 medical students and 17 nurses. A Cronbach’s alpha calculation was used to assess reliability. The resulting alpha value was 0.819.

The first section of the questionnaire covered demographic inquiries including sex, work experience and appointed department. The second section contained questions about participant knowledge concerning medical errors, past in-service training, number of witnessed errors during the last 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 one to ten. 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 four additional questions that addressed respondent knowledge about medical errors.

**Statistical analyses**

Analysis included descriptive analysis, one-way analysis of variance (ANOVA), Fisher’s Least Significant Difference (LSD) post hoc, Intra Class Correlation (ICC) test. SPSS (SPSS Inc., Chicago, IL, USA) software Version 23 was used. P values < 0.05 were 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%). Most participants (53 of nurses (35.1%), 41 of physicians (53.2%) and 23 of medical students (41.8%)) worked in internal medicine units. 62 of nurses (41.1%) and 31 of physicians (40.2%) had less than five years of work experience. Witnessing at least one error during the prior year was reported by 271 (95.5%) of respondents. More than half ( n=143, 50.5%) had observed 3 to 10 medical errors in the last year (Figure 1).
Physicians (n=31, 40.3%) and medical students (n=23, 41.8%) preferred to report errors by a telephone call or in person to a supervisor. However, nurses favoured using written forms to report an error (n=69, 45.7%).

Most physicians (n=32, 41.6%) stated that “I would report only themselves believing reporting superiors would be considered offensive.” Nurses (n=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 of physicians (49.4%), 120 of nurses (79.5) and 31 of medical students (56.4%). To measure agreement of actual information level and the self-perception of participants, we calculated group Intra Class Correlation (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 of hospital-provided medical error training courses had on study participants. Most physicians (n=55, 71.4%) and medical students (n=24, 43.6%) reported having no or inadequate training concerning errors or error reporting (n=59, 76.6%, 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 results of ANOVA test indicated significant differences between groups concerning individual barriers in general and among all sub-categories (Table 1). The LSD post-hoc analyses showed 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 (Table 2).

Barriers most often mentioned by physicians were “Worrying about the revelation of a colleague’s identity,” “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 3).
Discussion

Medical errors remain a serious health concern worldwide and require special attention by healthcare administrators and policy-makers (5,10). Healthcare providers often are 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 of Nemazee Hospital.

Results indicate that almost 96% of respondents 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 healthcare 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).

Like other studies, we found that nurses were more inclined to report medical errors than were physicians and students. Physicians were more reluctant to report errors than nurses and perceived more barriers against proper reporting (21,22). One study indicated that only 42% of physicians routinely reported medical errors (23). Conversely, there is information that suggests physicians are more likely to report major medical errors than other healthcare workers (9). Results of this study are like other surveys in that demographic characteristics reported, 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 study 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. Another study had reported opposite 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 (27). A survey among 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 were reported as major impediments (28). Other 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 performed in the United States revealed that when anonymous reporting was established, nurses reported both minor and major medical errors at higher rates (30). Sixty percent of physicians in a Saudi Arabian study mentioned 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 and another from the Islamic Republic of Iran (29). 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). Polisena et al. determined that more than half of physicians and nurses surveyed believed their reporting system was incompetent and that they failed to receive plausible and timely feedback (30). Our study had comparable results which indicated 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 an instructional guideline for medical students in 2009 which included 11 topics on patient safety (31). Multiple studies indicate that most medical students receive little information about medical errors or reporting techniques (31,32), and staff physicians and nurses also do not receive adequate information (8). Throckmorton et al. showed nurses could not identify errors in 40% of cases (33), 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.

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

**Conclusions**

Concerns about legal entanglements, reporting methodology and confidentiality issues were recognized as 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, lack of knowledge concerning identifying and reporting medical errors among physicians and medical students requires attention by hospital administers. A formal “reintroduction” of the reporting system with accompanying in-service training appears needed.

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**References**


18. Cheraghi MA, Nikbakhat Nasabadi AR, Mohammad Nejad E, Salari A, Ehsani Kouhi


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