Patient Safety & Quality Improvement Journal
http://psj.mums.ac.ir
PSQI

Frequency of Registered Medical Errors in a Hospital in Ardabil, Iran, Within 2017-18

Maryam Faraji-Fard[1],(MSc); Firouz Amani[2],(PhD); Somayeh Zeynizadeh Jeddi[3], (MD); Noushin Mobaraki[4], (MD);*Mahzad Yousefian[5], (MD)

1.MSc in Clinical Psychology, Alavi Hospital, Ardabil University of Medical Science, Ardabil, Iran.
2.Clinical Development of Research Center of Alavi Hospital, Alavi Hospital, Faculty of Medicine, Ardabil University of Medical Science, Ardabil, Iran.
3. Department of Radiology, Alavi Hospital, Faculty of Medicine, Ardabil University of Medical Science, Ardabil, Iran.
4. Department of Obstetrics and Gynecology, Alavi Hospital, Faculty of Medicine, Ardabil University of Medical Science, Ardabil, Iran.
5. Department of Anesthesiology, Alavi Hospital, Faculty of Medicine, Ardabil University of Medical Science, Ardabil, Iran.

ARTICLEINFO

Article type:
Original Article

***Article History*:**
Received: 3-Mar-2020
Accepted: 6-May-2020

Key words:
Ardabil, Hospital, Medical Errors, Nurse.

ABSTRACT

Introduction:
Patient safety is one of the main goals in a health system trying to reduce patient problems during hospitalization. These problems can be due to unintentional errors made by clinical staff the recognition and management of which are very important. The present study aimed to investigate the registered medical errors in Alavi hospital in Ardabil, Iran, during 2017-2018.

Materials and Methods:
In this cross-sectional study, all the wards were studied in Alavi hospital, and the data were collected by the evaluation of reported errors made by clinical staff and completion of the registered medical error forms. The collected data were analyzed through descriptive statistics.

Results:
During the study period, 1,050 registered errors were evaluated. Most errors (n=482; 45.9%) were detected in the women's surgery ward. According to the number of errors made by nurses in the hospital in comparison to those reported for other clinical groups, the nurses with 464 cases (44%) had the highest frequency of medical errors, and the caring errors (29%) were the most frequently committed type of errors.

Conclusion:
Based on the obtained results of the current study, it was shown that caring errors were the most frequently committed errors, and the highest frequency of medical errors occurred in the women's surgery ward. Therefore, providing educational training, emphasizing on doing hospital process, reducing the duration of work shifts, and increasing the number of personnel in hospitals, could be effective in decreasing errors and associated consequences.

Please cite this paper as:
Faraji-Fard M, Amani F, Zeinyzadeh S, Mobaraki N, Yousefian M. Frequency of Registered Medical Errors in a Hospital in Ardabil, Iran, Within 2017-18. Journal of Patient Safety and Quality Improvement. 2020; 8(2): 77-83.
Doi: 10.22038/psj.2020.46962.1264

****Corresponding Author:***
Department of Anesthesiology, Alavi Hospital, Faculty of Medicine, Ardabil University of Medical Science, Ardabil, Iran.
E-mail: dr_mahzad@yahoo.com

Introduction

It is a necessity for all individuals to refer to health centers for different reasons, such as receiving outpatient services and sometimes requiring hospitalization, throughout their lives. Anyone who visits a healthcare center expects to receive good quality services; however, in some cases, errors occur while providing healthcare which can sometimes lead to severe complications or mortalities. As a result, the identification of these errors and attempt to prevent them from reoccurring is one of the main goals of a health system. Patients in developing countries are more likely to be harmed in hospitals than in industrialized countries. Unsafe care and healthcare in addition to inflicting suffering on humans lead to heavy economic costs. According to the statistics, it has been shown that staffing errors affect 1 patient out of every 10 patients admitted to hospitals worldwide (1). For this reason, medical errors have currently become a major challenge in global health systems, especially in developing countries.

According to the published reports, medical errors are among the main causes of the increase in hospital complaints. A medical error is an act or decision that does not match the healthcare standards (2). The results of a review study estimated medical errors at 52 per 100 hospital admissions and 24 per 1,000 days (3). According to the estimates, 225,000 patients die annually in the hospitals of the United States due to medical errors (4).

These errors can be due to inappropriate communication, physician prescribing errors, and failure to record patient medical information (5). The results of another study carried out on medical errors revealed that the causes of medical errors included a lack of in-service training and experience, exhaustion, stress, overwork, and lack of communication among healthcare professionals (6). Some studies have identified weaknesses in knowledge and skills as the most important causes of medical errors among all factors (7). The prevalence of new diseases and increase in the frequency of referrals to medical centers have also led to an increase in the frequency of medical errors. Among physicians and surgeons, general practitioners (16.8%) and nurses (9.8%) had the highest number of complaints of medical error (1). Another study reported that one-quarter of nurses make medical errors each year harming the patient, and 60% of them reported that they have committed at least one medical error not harming the patient (8).Medical errors are divided into two categories substructure and process which substructure errors including errors involving manpower and equipment errors. Therefore, in the identification of the types of errors, the factors leading to making errors and individuals causing errors are very important in the prevention of error reoccurring. Human errors include treatment errors, recording errors, medication errors, and diagnostic errors each of which leads to serious damage to patients and healthcare system in case of occurrence (9).The occurrence of medical errors in Iran have no clear statistics; however, according to the published data, for every 100 to 150 patients admitted to hospitals, one patient dies due to medical errors (10). The results of a study carried out in a hospital in Iran showed that the number of recorded errors in the pediatric ward accounted for 6.3% of all medical files (11). Given the importance of medical errors leading to the imposition of costly and financial costs on patients and healthcare system, it is required to perform further studies to reduce the number of medical errors by the identification of the type and nature of medical errors (12).The purpose of this study was to identify reported medical errors in Alavi hospital in Ardabil, Iran. Accordingly, appropriate planning and interventions by hospital managers and authorities can reduce the imposed financial burden of this issue to increase patient satisfaction and trust in public health centers.

Materials and Methods

Design and Participation

This cross-sectional study was carried out at Alavi hospital in Ardabil during 2017-2018. This hospital had labor, delivery, and recovery room, women's surgery ward, neonatal intensive care unit, intensive care unit, magnetic resonance imaging ward, and neurology ward. In this study, all the hospital units (i.e., 11 clinical units and 3 laboratory,

pharmacy, and imaging units) were evaluated. Medical errors in this study were defined as all the errors made by all hospital staff in all wards while providing services to patients.

Research Instruments

In order to collect medical errors, an error report form was used available to all personnel that can report on a case-by-case basis, including classified items about the type of error, error shifts, error incidence, and occupation of staff. All reported errors (i.e., registration, care, medication, and diagnostic) were investigated since the beginning of 2017 to the end of the 2018.

Statistical Analysis

The collected data were analyzed by atistical methods in SPSS software (version 19).

Results

The results of this study showed that a total of 1,050 errors were reported in the studied period at Alavi hospital 279 (26.59%) and 771 (73.41%) of which were related to 2017 and 2018, respectively. The most frequently reported errors were committed in the gynecology unit in 2018 with 376 cases (48.79%) which was higher than that (37.99%) reported for 2017 (Table 1).

Table 1: Frequency of reported errors during study years based on wards

Year Ward	2017		2018		Total	
	n	%	n	%	n	%
Emergency	22	7.88	12	1.56	34	3.23
Delivery 1	34	12.19	112	14.52	146	13.91
Labor, delivery, and recovery room	16	5.73	18	2.33	34	3.24
Women's surgery ward	106	38	376	48.84	482	45.91
Neonatal intensive care unit	9	3.23	30	3.89	39	3.71
Women's neurology	55	19.71	76	9.86	131	12.48
Men's neurology	26	9.32	34	4.41	60	5.71
Intensive care unit	0	0	4	0.52	4	0.38
Delivery 2	6	2.15	34	4.41	40	3.81
Laboratory	0	0	7	0.91	7	0.67
Radiology	0	0	18	2.33	18	1.71
Operation room	5	1.79	50	6.49	55	5.24
Total	279	100	771	100	1050	100

The nurses were the most common occupational category of hospital error-makers (n=464; 44.19%). The frequency (44.12%) of nurses' errors in 2017 was similar to that (44.21%) reported for 2018 (Table 2).

Table 2: Occupational status of staff regarding committing error

Year Occupational status		2017		2018		Total
	n	%	n	%	n	%
Physician	38	13.62	32	4.23	70	6.73
Nurse	123	44.12	341	44.21	464	44.19
Midwife	49	17.62	271	35.12	320	30.49
Other staff	69	24.72	127	16.54	196	18.72
Total	279	100	771	100	1050	100

The highest rate of errors was reported in the morning shift with 337 cases (43.71%) in 2017 and 107 cases (38.41%) in 2018 which was significantly higher in 2017, compared to that in 2018.

The aforementioned highest rate of error can be related to the presence of ward head for the supervision of staff performance, higher number of patients in the morning shift, and use of an incentive system for active people in error reporting all of which could be very effective in medical error reporting
(Table 3).

Table 3: Frequency of reported errors based on working shifts during study years

Year Working shift	2017		2018		Total	
	n	%	n	%	n	%
Morning	107	38.35	337	43.71	444	42.3
Evening	67	24.01	202	26.19	269	25.6
Night	105	37.63	232	30.1	337	32.1
Total	279	100	771	100	1050	100

Most of the errors in this study were related to the type of caring errors with 309 cases (29.41%) similar in both 2017 and 2018 (Table 4).

Table 4: Frequency of reported errors based on type of errors during study years

Year / Type of errors	2017		2018		Total	
	n	%	n	%	n	%
Diagnostic	24	8.61	20	2.62	44	4.19
Medication	27	9.68	140	18.19	167	15.89
Caring	81	29.04	228	19.62	309	29.41
Method of recording in patient file	44	15.78	22	28.49	266	25.31
Others	103	44.1	161	21.19	264	25.12
Total	279	100	771	100	1050	100

Table 5: Frequency of causes of reported errors during study years

Year / Cause of errors	2017		2018		Total	
	n	%	n	%	n	%
Improper dose of medication	11	40.71	46	32.89	57	34.12
Wrong drug	6	22.21	43	30.71	49	29.31
Wrong prescription	4	14.79	8	5.81	12	7.18
Other	6	22.21	43	30.69	49	29.34
Total	27	100	140	100	167	100

The most common cause of drug errors in both 2017 and 2018 was the inappropriate dose of medication in 57 cases (34.12%; Table 5).

The most common cause of caring errors during 2017-2018 with 26.29% was the failure to execute or delay the performance of physician orders (Table 6).

Table 6: Frequency of causes of reported caring errors during study years

Year Cause of caring errors	2017		2018		Total	
	n	%	n	%	n	%
Failure to comply with or delay physician's order	23	28.39	60	26.29	83	26.61
Negligence in patient intravenous line	11	13.62	37	16.19	48	15.49
Lack of proper patient identification	6	7.41	20	8.79	26	8.39
Other	41	50.62	111	48.71	152	49.16
Total	81	100	228	100	309	100

In the comparison of medication and caring errors based on the medical ward, 75 cases (44.89%) of medication errors and 116 (37.49%) cases of caring errors were reported in the gynecology unit (Table 7).

Table 7: Frequency of reported medication and caring errors during study years based on ward

Year / Ward	2017		2018		Total		Total	
	Medication	Caring	Medication	Caring	Caring	%	Medication	%
Emergency	2	0	2	0	4	2.42	0	0
Delivery 1	7	11	28	36	35	20.11	47	15.19
Labor, delivery, and recovery room	1	7	6	35	7	4.19	42	13.59
Women's surgery ward	7	31	68	85	75	44.89	116	37.49
Neonatal intensive care unit	0	6	0	6	0	0	12	3.59
Women's neurology	4	7	14	22	18	10.91	29	0.32
Men's neurology	2	6	9	14	11	6.59	20	6.49
Intensive care unit	0	0	0	1	0	0	1	0.32
Delivery 2	2	9	8	25	10	5.12	34	11.21
Operation room	2	4	5	4	7	4.19	8	2.58
Total	27	81	140	228	167	100	309	100

Discussion

The obtained results of this study showed that about 1,050 medical errors were reported within 2 years. Medical errors can cause harm to patients and hospitals (13-14). Some errors can cause severe injuries to patients or even mortalities. Since any error is a sign of weakness in hospital performance, increasing the frequency of medical errors is a danger to a health system. In a study carried out by Bagherian et al., it was demonstrated that the prevalence of new diseases and increase in the number of referrals to medical centers are two important factors in increasing the rate of medical errors (3). In another study conducted by Salami et al., it was observed that 30.2% of the errors occurred during the night shift, which is inconsistent with the results of the present study (15).

Mohsenzadeh et al. stated that medical errors in hospitals have become a challenging subject that needs to be seriously investigated (11). The increase in the rate of medical errors reported in 2018, compared to that in 2017 at the center, is due to the increasing the patient safety culture among staff which indicated reporting error without fear of blame and punishment and also by consideration of encouragement for active individuals from head of hospital side has also been effective in reporting errors by personnel. On the other hand, the increase in the frequency of medical errors is also due to the increase in the rate of referrals to medical centers (1).

Due to the consequences of medical errors, they should be prevented for any reason. In large hospitals, due to the high number of patients entering the hospital, insufficient staff and great volume of medical staff activities increase the likelihood of errors (12). In this center, the highest number (45.91%) of errors occurred in the women's surgical ward which can be due to the high participation of staff in the process of error reporting. Most of the errors recorded in the studied hospital were caring errors and errors in the method of recording in patient files which could be related to the hospital management system and non-use of guidelines in the registry system of medical errors facilitating the occurrence of medical errors. To support this finding, Sorens declared that management and systemic errors are the most frequently committed errors in hospitals (16).

Most of the errors in the present study were caring errors indicating weaknesses in staff performance and non-compliance with hospital guidelines. In a study carried out by Setoudehzadeh et al., it was demonstrated that most of the errors recorded at Shiraz women's gynecologic ward were systemic (17). In another study carried out by Farvardin et al. in a hospital in the southern part of Iran, it was reported that 43% of structural errors were systematic (18). However, in a study performed by Mohsenzadeh et al., it was shown that most errors in the hospital are of the medicinal type (11). Therefore, it can be concluded that in each hospital, especial errors occur depending on the condition and type of the hospital, specialty and nature of the medical staff, and human resources (12).

In a study conducted by Malekzadeh et al., it was shown that most of the errors occurred in clinical settings, which was similar to the results of the present study (19). This study also shows that according to the occupational class, nurses with 44.2% are the most common causes of errors in the hospital during the studied years. Since nurses are more exposed to occupational injuries, such as stress, fatigue, long shifts, excessive workload, and decreased motivation, than other treatment groups, the quality of their activities decreases more (20). Therefore, nurses are more likely to have errors or malfunctions in their activities than other groups.

In a study carried out by Salmani et al., it was demonstrated that nurses with 44.4% had the highest rate of hospital errors, which is similar to the results of the present study (15). Darabi in his study showed that 40.1% of hospital errors are due to nursing errors, and other errors are related to physicians and other medical staff (21). Since the workload of the hospital in the morning shift is higher than those reported for the evening and night shifts, the number of errors in the morning shift is higher than other shifts. In a study conducted by Darabi et al., it was reported that most medical errors (41%) occurred in the evening shift, which was inconsistent

with the results of the aforementioned study. In addition, nurses' fatigue in the evening shift was also the most common cause of making medical errors (21).

Mohsenzadeh et al. reported that most errors occur on the weekends and night shifts (11). The reason for these differences is the type of studied hospitals. Given this finding, treatment staff in the morning shift needs to be more attentive and sensitive to their duties and activities (12). In another study carried out by Bagheri et al., it was shown that nurses were among the groups with the highest frequency of errors and highest frequency of non-injectable medication error type (38.6%) which was somewhat consistent with the frequency of drug errors recorded in the present study (22).

Conclusion

The obtained results of the current study showed that among the recorded errors in Alavi hospital during 2016-2017, the women's surgical ward had the highest frequency of errors, and most errors were related to the caring type. The occurrence of a medical error is recognized as a weakness in hospital performance leading to a decrease in patient safety. As a result, it is essential to reduce the frequency of medical errors in hospitals by the modification of the guidelines, encouragement of an error reporting system, and determination of error background. In addition, the occurrence of medical errors can be prevented in future by decreasing the number of shifts and working hours of nurses and establishing committees to control and monitor the activities of nurses.

Acknowledgments

The present study was financially supported by the Clinical Research Development Center of Alavi hospital and Ardabil University of Medical Sciences. The authors would like to extend their gratitude to all the staff of the hospital who participated in the data collection.

References

1. Bagherian Mahmoodabadi H, Setareh M, Nejadnick M, Niknamian M, Ayoobian A. The Frequency and Reasons of Medical Errors in Cases Ref erred to Isfahan Legal Medicine Center. Health Information Management 2012; 9(1): 109.

2. Banja J. Medical Errors: A primer. Case Manager 2005; 16(3):57-9.

3. Lewis P, Dornan T, Taylor D, Tully MP, Wass V, Ashcroft DM. Prevalence, incidence and nature of prescribing errors in hospital inpatients: a systematic review. Drug Safe 2009; 32 (5): 379-89.

4. Starfield B. Doctors Are The Third Leading Cause of Death in the US. Journal of the American Medical Association 2000; 284(4):483-5.

5. Rodd holder A. Medical Errors. Hematology 2003; 2(1): 503.

6. Tully M P. The Causes of and Factors Associatedwith Prescribing Errors in Hospital Inpatients: ASystematic Review. Drug Safe 2009; 32 (10): 819-36.

7. Waldman JD, Smith HL. Strategic Planning to Reduce MedicalErrors: Part I—Diagnosis. J Med Pract Manage 2012; 27(4):230-6.

8. Maurer, M J. Nurses' Perceptions of and Experienceswith Medication Errors. The dissertation of PhD.TheUniversity of Toledo:2010.

9. Heydar pour P. Family of tent of clinical governance.Tehran,Tandis Published 2011;40-5.

10. Soltani K. Medical Organization. Published in Jam-eJam newspaper, number of news: 100852372860, Date of Publication: 2011.

11. Mohsenzade A, Rezapour, S, Birjandi, M. Theprevalence of medical errors in children admitted toMadani hospital in the six months.Yafte 2009; 11(4): 31-38. (Persian)

12. khammarnia M, ravangard R, ghanbari jahromi M, moradi A. Survey of Medical Errors in Shiraz Public Hospitals: 2013. Journal of Hospital 2014; 13 (3):17-24. (Persian)

13. Doshmangir, Sari A. Rate, nature, consequencesand likely cause of adverse event and medical error. Journalof hospital 2008; 3: 45-8. (Persian)

14. Sari AB, Shedon TA, Crancknell A, Trunbull A, Dobson Y, Grant C, et al . Extent, nature and consequences of adverse events: resultsof a retrospective case note review in a large NHS hospital. Qual Saf Health Care 2007; 16:434-439.

15. Salmani N, Fallah-tafti B. Frequency, Type and causes of Medication Errors in Pediatric Wards of Hospitals in Yazd, the Central of Iran. Int J Pediatr 2016; 4(9):3475-347.

16. Soerensen AL, Lisby M, Nielsen LP, Poulsen BK. The medication process in a psychiatric hospital: areerrors a potential threat to patient safety? Risk Manag Health Policy 2013; 6: 23–31.

17. Sotodezade F, Gharkhalo Kh, Sotodezade S, Azami S. Study nursing and medical errors in Gynecology wardsin Shiraz hospital and ways to reduce them in 2012, the first congress of student clinical governance and continuous quality improvement: 2012.

18. Farvardin M, Derakhshan S, Behzadi F. Epidemiological study of hospital medical errors in Ganaveh hospital in 2011, the first congress of Clinical Audit and Quality Conference: 2013.
19. Malekzadeh R, Araghian-Mojarrad F, Amirkhanlu A, Sarafraz S, Abedini E. Incidence of Medical Errors in Voluntary Reporting System in Hospitals of Mazandaran University of Medical Sciences in 2014. Manage Strat Health Syst 2016; 1(1) :61-9.
20. Saremi M, Fallah M. Subjective fatigue andmedical errors among nurses in an educational hospital. Iran Occupational Health Journal 2013; 10 (4):1-8.
21. Darabi, F. The frequency of Nursing and Midwiferyerrors in the cases referred to the Medical Council inKermanshah. Journal of Kermanshah 2009; 13 (3): 261-6.
22. Bagheri-Nesami M, Esmaeili R, Tajari M. Frequency of Non-Injectable Medication Administration Errors in Nurses of Cardiac Critical Care Units in Mazandaran Province in 2014. J RafsanjanUniv Med Sci 2016; 15(2): 151-64. (Persian)