ORIGINAL ARTICLE

Analysis of patient falls among hospitalised patients in Makkah region

Mohammed Abdulwahab Flimban,[1] Dalal Fouad Abduljabar,[2] Khalid Obaid Dhafar,[3] Basma Abdulhameed Deiab,[4] Zohair Jamil Gazzaz,[5] Abasra Usman Bansuan,[6] Abeer Ahmad Balbed,[7] Ahmad Mohammed Al-Shaikhi,[8] Sultan Saad Al-Motari,[9] Muhammad Imran Suliman[10]

Abstract

Objective: To assess the frequency and its correlation of patient fall with preventing or precipitating factors among inpatients.

Methods: The observational study was conducted in Makkah Region, Saudi Arabia from October 15 2012 to November 4, 2013. Data was collected using a questionnaire from 16 hospitals in four districts of Makkah province. The material was sampled through systematic randomisation from inpatient files and data was collected for those who had fallen inside the hospital. The questionnaire, validated through a pilot study run under the Directorate of Quality and Patient Safety in Makkah, was used to see whether the hospitals had adopted and applied international standards for assessment of adult and paediatric patients for falls as well as effectiveness of these applications.

Results: Of 4,799 beds, occupancy rates ranged from 1680(35%) to 4,799(100%). Out of 291 falls in all, 144(49.48%) were in Jeddah. Besides, 116(40%) of the falls occurred in the last quarter of the Islamic calendar. Statistically significant difference was found in fall episodes in different months (p=0.007). Statistical analysis indicated that the factors that significantly raised the number of patient falls were increase in hospital beds and their occupancy rate (Spearman's correlation: 0.621 and 0.579 respectively).

Conclusion: The frequency of falls varied from hospital to hospital and factors like higher number of bed capacity and occupancy rate increased the falls.

Keywords: Patient falls, Hospitals, Injury, Patient safety, Falls. (JPMA 66: 994; 2016)

Introduction

Patient falls inside hospitals vary from 1.4 to 17.9/1000 depending on the characteristics of patients and health provision services.[1] The resultant injuries may reach 30%, with major consequences like fractures, bleeding or death ranging from 4% to 6%.[2] These events indirectly increase health care cost in the form of longer hospital stay, indirectly causing a huge burden on the surgical as well as other health providing facilities.[3] Moreover, patients may succumb to physical as well as emotional trauma, and hospitals may have to face legal issues.[4]

In this study 'fall' is defined as 'a patient falling, coming in contact with the ground or another surface, suddenly and without expectation.' It excludes falling as a result of violence or deliberately falling. This is in agreement with the definitions adopted in various international studies.[5] Falls in hospital may be due to causes like dizziness, limb weakness, visual impairment and hypotension or other internal bodily factors. There may be external factors which contribute to the patients falling, such as wet floors or cables on the ground, patient's bed height, inadequate light in the room and absence of supporting handles on the walls of the corridors and restroom.[6]

Despite the continued efforts to bring quality in patient safety inside hospitals, falls continue to be a major problem, exceeding 90% of the reported accidents during a patient's hospital stay.[7]

According to the World Health Organisation (WHO), the second leading cause of death or injury is falls, either accidental or unintentional. It has been estimated that 424,000 people die each year all over the world because of falls and 80% of these incidents occur in low- or middle-

[1]General Director: Quality and Patient Safety Department. General Directorate of Makkah Region Health Affairs, [2]Patient Safety Supervisor, Quality and Patient Safety Administration in General Directorate of Makkah Region Health Affairs, [3]Consultant General Surgeon Al-Noor Specialist Hospital Makkah Al-Mukkaramah, [4]Nursing Department Makkah Region General Directorate of Healthcare Affair Makkah Region-Nursing Department, [5]Assistant Professor of Medicine /Consultant Medicine (Diabetes) Rabigh Medical College King Abdulaziz University, Jeddah, [6]Nursing Department, King Abdul Aziz Specialist Hospital / Taif, Directorate of Healthcare Affair Taif, [7]General Directorate of Healthcare Affair Makkah Region-Quality and Patient Safety Department, [8]Nursing Department Al-Qunfotha Hospital Directorate of Healthcare Affair Al-Qunfotha, [9]King Fahd General Hospital, Jeddah, [10]Clinical Skills, Department of Medicine, Faculty of Medicine at Rabigh, King Abdul Aziz University, Kingdom of Saudi Arabia.

Correspondence: Mohammed Abdulwahab Flimban.
Email: register@HealthcareExpertise.org

income countries.[8] Most of the time, patients aged above 65 years are the victims.[9] Due to unexplained reasons, females appear to have greater risk of falling after excluding physical and social cofounders.[10] Every year 37.3 million cases of falls acquire a degree of severity that need medical attention.[11]

In addition to the international prevailing factors, local customs and religious practices like ablutions before prayers were taken into account to predict increase in falls. Social and religious gatherings, especially the Hajj, may influence the rate of falls.[12]

The current study was planned to obtain information regarding the magnitude of fall occurrences as well as assessment of the quality performance directly related to prevent such episodes in health institutions of the region.

Materials and Methods

The observational study was conducted at 16 hospitals in four districts of the Makkah region, Saudi Arabia, from October 15, 2012 to November 4, 2013. The material was selected by stratified random sampling technique from the inpatient files.

This study was initially approved by the Director-General of Health, Makkah Region, and approval was obtained later from the regional ethics committee as well.

Data was gathered using a questionnaire, designed by a team of experts within the Directorate of Quality and Patient Safety in Makkah. A pilot study was conducted to check the validity of the survey form and the final questionnaire was designed according to the initial guidelines.

After completed questionnaires were pooled, 195 of them were selected instead of the desired number of 240, mainly due to non-application of policies and procedures for the fall of patients in three hospitals. The questionnaire was aimed at encompassing various issues such as bed occupancy rate, distribution of nursing staff in the inpatient department, outpatient department (OPD) and intensive care unit (ICU). Data was also collected to see whether the hospitals had adopted and applied international standards for assessment of adult and paediatric patients for falls as well as effectiveness of these applications.

The falling of a patient's body to the ground or another surface without expectation was included. Incidents of deliberate falls or those resulting from violence were excluded. Patients admitted to a psychiatric unit were also excluded.

MS Excel and SPSS 21 were used for data analyses. Quantitative data was analysed through one-sample Kolmogorov-Smirnov test. P-value of 0.909 suggested that data followed normal distribution and for further inferential analysis, parametric tests were applicable.

Analysis of Variance (ANOVA) test was performed on descriptive measures. Kruskal Wallis test was used to compare the count variables among hospitals. Spearman's correlation was computed to measure correlated effect between variables. P-value of less than 0.05 was considered significant.

Results

Of 4,799 beds in all, occupancy rates ranged from

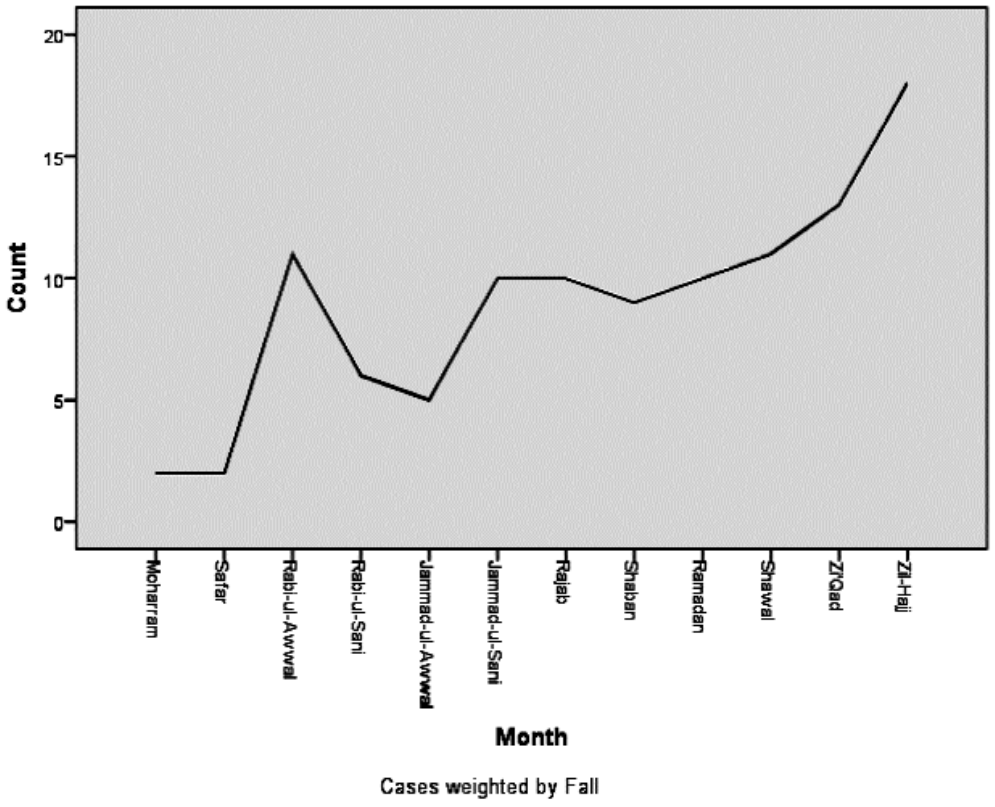

Figure: Trend in Patients Fall for 12 months.

Table: Districts-wise Comparison Descriptive / Inferential.

		Holy City	Jeddah	Taif	Qunfuza
	No. of Hospitals	5	7	3	1
Number of Patients Falls in Four Districts	Mean	11	21	23	24
	Std. Deviation	10	19	5	.
	F-stat		0.699		
	p-vale		0.57		
Number of Beds in Four Districts	Mean	303	330	275	150
	Std. Deviation	115	332	199	.
	F-stat		0.154		
	p-vale		0.925		
Occupancy Rate	Mean	72	74	84	70
	Std. Deviation	11	27	16	.
	F-stat		0.205		
	p-vale		0.891		
Staff Ratio in Intensive Care	Mean	1	1	1	0
	Std. Deviation	0	1	0	.
	F-stat		3		
	p-vale		0.073		
Staff Ratio in Emergency	Mean	0	0	1	0
	Std. Deviation	1	0	1	.
	F-stat		0.425		
	p-vale		0.739		

1680(35%) to 4,799(100%).

Of the 291 falls reported, 144(49.48%) were in Jeddah; and 116(40%) had occurred in the last quarter of the Islamic calendar.

District-wise comparison was made with respect to five important factors and the result was insignificant in each case (p>0.05) (Table).

Documentation of falls had significantly increased with higher occupancy rate (r=0.707), hospital-wide policy and procedures (r=719) and higher rate of patients assessment on admission (r=0.756). It was found that hospitals with higher bed capacities and occupancy rates had significantly higher numbers of falls in one year (Spearman's Correlation: 0.621 and 0.579 respectively).

Factors like distribution of nursing staff in the ICU had slightly significant impact on falls (p=0.073) whereas such observation in other situations, like emergency, could not be found statistically significant (p=0.739). Significant statistical difference was found among the falls in different Islamic months (p= 0.007). In the first two months, the falls were significantly less (p<0.05)(Figure).

Discussion

Frequency of adverse events has become more important in terms of quality related to health care facilities. Documentation of adverse events assists in evaluation of the effectiveness of health services and promotes use of indicators to prevent such events. The main purpose of the study was to observe the frequency of fall rates in different hospitals. Published literature has different definitions for falls and fall-related injuries. A patient found resting on the floor unintentionally, comes under the category of fall. While defining such events the researchers have included all those patients who were found to be on the floor and were unable to stand by themselves. Similarly, some others have included all those events as falls where patients slipped out of their chairs.[13] Likewise, others

have included events where falls were secondary to cerebrovascular accidents, fits or deranged conscious levels. These definitions have got extension to the extent when patient was found to be at the level lower to his original position.[14,15]

The difference in the number of falls among cities can mainly be attributed to the higher bed capacity as well as increased bed occupancy in the hospitals, the exceptions being Taif and Qunfuza districts where falls events were out of proportion, compared to the number of beds and occupancy rates. Six different studies, reviewing fall frequency in different European countries and New Zealand, found fall percentages ranging from 28% to 42%. Researchers found a frequency of 6-31% falls per year in China, 20% in Japan, and 24% in Havana.[16]

In our study hospitals adhering to policies and procedures to prevent falls rates were showing higher fall rates as compared to those where such policies or procedures were either not followed or not updated. These differences may be because of the variance in the reporting mechanism and accuracy in reporting the incidents. It is of particular importance that healthcare staff should report adverse incidents for better understanding of mistakes and to probe into the causative elements.[17] However, running multi-step interventions to prevent falls in the hospital have come to fruition in several studies.[18]

The frequency of falls among different hospitals can vary according to patient demographics and specialties in the hospital. Theoretically, assessing the risk factors for falls can predict the likely outcome in high-risk group patients, like older age and females.[8,9] Following such parameters helps to identify the patients who are at high risk and the circumstances that lead to falls. Although validation of risk assessment tools with high sensitivity and specificity has been challenged in a variety of clinical settings, putting attention to common reversible risk factors can predict and help in prevention of fall.[19] In order to enhance the generalisability, these fall risk assessment tools should be meticulously evaluated in diverse clinical situations.[20] Although implementation of fall prevention programmes may not be able to prevent or reduce the chance of falling in patients, it can reduce the chance of injury and severity of injury.

Our research is the first of its kind in the Makkah Region. The only other study we could find was carried out at only one hospital where the study had focussed on the elderly with polypharmacy, sedentary lifestyle or physical constraints.[21] The recommendations generated from our study will help to implement adequate fall prevention strategies at a regional level.

However, the study had several limitations. It exposed only the falls incidents over one year in different hospitals, taking into consideration their falls reporting protocol. The impact of the study would have been more if the fall indicators and patients' demographics were included. Moreover, the reporting of variables was in aggregate form where many variables were either irrelevant or less reported, leading to missing data for some crucial spheres. Similarly, the number of days a patient remained in hospital was not addressed explicitly to compute the standard falls rate i.e., falls/1000 patient-days. A detailed review of risk factors for fall as well as focus on contributing factors or triggering factors for the falls must be probed to generate recommendations for prevention strategies.

However, overall this study still conveyed valuable data on the subject. We plan a follow-up study in which we would include several factors relating to falls and the overall outcomes in relation to detailed patients' demographics.

Conclusion

The frequency of falls varied among different hospitals and increased with the number of bed capacity and occupancy rate, and during the Hajj season.

References

1. Schwendimann R, Bühler H, De Geest S, Milisen K. Falls and consequent injuries in hospitalised patients: effects of an interdisciplinary falls prevention program. BMC Health Serv Res. 2006; 6:69.
2. Morse JM, Prowse MD, Morrow N, Federspeil G. A retrospective analysis of patient falls. Can J Public Health. 1985; 76:116-8.
3. Tinetti ME, Williams CS. The effect of falls and fall injuries on functioning in community-dwelling older persons. J Gerontol A Biol Sci Med Sci. 1998; 53:M112-9.
4. Heinze C, Dassen T. Sturzhäufigkeit in deutschenKliniken. Gesundheitswesen 2002; 64:598-601.
5. Hauer K, Lamb SE, Jorstad EC, Todd C, Becker C; PROFANE-Group. Systematic review of definitions and methods of measuring falls in randomised controlled fall prevention trials. Age Ageing. 2006; 35:5-10.
6. Sehested P, Severin-Nielsen T. Falls by hospitalised elderly patients: causes, prevention. Geriatrics. 1977; 32:101-8.
7. Goodwin MB, Westbrook JI. An analysis of patient accidents in hospital. Aust Clin Rev. 1993; 13:141-9.
8. World Health Organisation. Falls: fact sheet number 344. Geneva: WHO, 2010.
9. Kallin K, Jensen J, Olsson LL, Nyberg L, Gustafson Y. Why the elderly fall in residential care facilities, and suggested remedies. J Fam Pract. 2004; 53:41-52.
10. Campbell AJ, Spears GF, Borrie MJ. Examination by logistic regression modelling of the variables which increase the relative risk of elderly women falling compared to elderly men.

J Clin Epidemiol. 1990; 43:1415-20.
11. Pauls JL. Safety standards, requirements, and litigation in relation to building use and safety, especially safety from falls involving stairs. Safety sci 1991; 14: 125-54.
12. Yoshida S. A global report on falls prevention: epidemiology of falls. World Health Organisation, 2007.
13. Hilliard DJ, Frederick L, Tierney-Gumaer R, Simpson MJ. Exploring the Relationship between Cultural Values, Beliefs, and Practices and Patient Falls: A Middle Eastern Study. J Healthc Qual. 1999; 21:42-8.
14. Morris EV, Isaacs B. The prevention of falls in a geriatric hospital. Age Ageing. 1980; 9:181-5.
15. Kellogg International Work Group, Gibson MJ, Andres RO, Isaacs B,Radebaugh T, Worm-Petersen J. The prevention of falls in later life: areport of the Kellogg International Work Group on the Prevention ofFalls by the Elderly.Dan Med Bull. 1987;34:1-24.
16. Florida Hospital Association Patient Safety Steering Committee. Building the foundations for patient safety. November 2001.[Online] 2001[cited 2005 August 31]. Available from: URL: http://www.fha.org/acrobat/patientsafety2.pdf.
17. Evans SM, Berry JG, Smith BJ, Esterman A, Selim P, O'Shaughnessy J, et al. Attitudes and barriers to incident reporting: a collaborative hospital study. QualSaf Health Care. 2006; 15:39-43.
18. Haines TP, Bennell KL, Osborne RH, Hill KD. Effectiveness of targeted falls prevention programme in subacute hospital setting: randomised controlled trial. BMJ. 2004; 328:676.
19. Oliver D, Daly F, Martin FC, McMurdo ME. Risk factors and risk assessment tools for falls in hospital in-patients: a systematic review. Age Ageing. 2004; 33:122-30.
20. Myers H. Hospital fall risk assessment tools: a critique of the literature. Int J Nurs Pract. 2003; 9:223-35.
21. Al Saif A, Waly E, Alsenany S. The Prediction of Falls Among older people in Saudi Arabia. J Am Sci. 2012; 8.