

Patient Falls in a Multispecialty Tertiary Care Hospital in Kolkata: A Discussion on the Risk Factors and the Fall Reduction Strategies

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ABSTRACT

Background: Patient falls in hospital settings are one of the most common causes of accidental injuries. Epidemiologic studies show that falls occur at a rate of 3–5 per 1,000 occupied bed-days. Fall related injuries pose an under burden on the healthcare utilization. However, there is a scarcity of data on falls in hospital settings in India. With this objective the current study was undertaken. The study also aimed to see the effect of the interventions done starting from June 2018 aimed towards intensifying the implementation of the Fall Prevention Program already existing in the hospital

Materials and Methodology: An observational retrospective study was conducted in a 700 bed multispecialty tertiary care hospital in Kolkata. A total of 96 patient falls were reported during the period from January 2017 to November 2019 which was considered in the study. Data for this study was entered into a computer based spreadsheet for analysis using SPSS (version 21) (IBM Corp., NY, USA). The statistical tests applied included descriptive statistics and chi-square tests for testing the association if any. *P* value of <0.05 was considered statistically significant.

Results: We saw a sharp decline in the average fall rate from 0.18 per 1,000 occupied bed-days from January 2017 to May 2018 to 0.10 per 1,000 occupied bed-days from June 2018 to November 2019 which is a 44.44% decrease in the fall rate.

We did not find any association between sex and the fall rate in our study (*p* value 0.574). However, we found statistically significant associations between age and the fall rate with patients in the age group of <16 years or ≥ 65 years sustaining more fall than others (*p* value 0.046), mobility status of the patient at the time of sustaining fall with immobile patients sustaining more falls than mobile patients (*p* value 0.011) and presence or absence of attendant at the time of sustaining the fall with patients without attendants sustaining more falls than patients with attendants (*p* value 0.020).

Discussion: The findings were in consonance with many studies.

Conclusion: Patients may continue to fall and sustain injuries during their hospitalization despite a comprehensive fall prevention program in place. The role of a nursing staff trained in the hospital fall prevention strategies in preventing patient fall can in no way be demeaned. However, the importance of a collaborative multipronged approach and empowering patients and families to become partners in the fall reduction program in a hospital setting is also of paramount importance.

Keywords: Patient falls; Fall Prevention Program; Fall-related injuries

BACKGROUND

Patient falls in hospital settings are one of the most common causes of accidental injuries. Studies show that falls

occur at a rate of 3-5 per 1,000 occupied bed-days, and the Agency for Healthcare Research and Quality estimates that 700,000

to 1 million hospitalized patients fall each year. ^[1]

Studies in England and Wales have reported still higher rates for patient falls. The most recent audit data by the Royal College of Physicians show an average of 6.63 falls per 1,000 occupied bed days. ^[2]

30 percent to 35 percent falls result in some physical injury, fractures occur in 1-3% cases while approximately 11,000 falls are fatal. ^[3-6]

The National Database of Nursing Quality Indicators (NDNQI), March 2012 defines a patient fall paraphrased as below:

“A patient fall is an unplanned descent to the floor with or without injury to the patient. Include falls when a patient lands on a surface where you wouldn't expect to find a patient. All unassisted and assisted falls are to be included whether they result from physiological reasons (fainting) or environmental reasons (slippery floor). Also report patients that roll off a low bed onto a mat as a fall.”

The NDNQI definitions for injury are as follows:

“None—patient had no injuries (no signs or symptoms) resulting from the fall, if an x-ray, CT scan or other post fall evaluation results in a finding of no injury.

Minor—resulted in application of a dressing, ice, cleaning of a wound, limb elevation, topical medication, bruise or abrasion.

Moderate—resulted in suturing, application of steri-strips/skin glue, splinting or muscle/joint strain.

Major—resulted in surgery, casting, traction, required consultation for neurological (basilar skull fracture, small subdural hematoma) or internal injury (rib fracture, small liver laceration) or patients with coagulopathy who receive blood products as a result of the fall.

Death—the patient died as a result of injuries sustained from the fall (not from physiologic events causing the fall).”

Fall-related injuries result in prolonged hospital stays for treatment, surgery, and sometimes even death and pose an under burden on the healthcare utilization. Added to these is the psychological trauma in patients who have sustained a fall leading to decreased mobility and increased future fall risk. Evidence supports the fact that risk for falls increases with age, and fall rates are highest in the geriatric patients. ^[7]

Yet majority of falls are not true accidents and are not an inevitable consequence of ageing; they are the result of an interplay of multiple intrinsic (related to the patient) and extrinsic (environmental influences) risk factors potentiated by riskiness of a person's behaviors. Encouragement of mobility is an essential feature of recovery from illness in hospital. However, this poses an obvious dilemma for clinical staffs. The unfamiliar hospital settings together with the patient's clinical condition sometimes aggravated by associated psychological factors due to hospital stay serve to amplify the risk of falls for hospitalized patients more so elderly patients. ^[8]

Well established fall risk factors inherent to hospitalized patients are previous history of fall, gait instability and lower limb weakness, urinary incontinence, frequency and/or need for toileting, agitation, confusion, or impaired judgment, Medications, especially sedative hypnotics and other medications which cause dizziness, unsteadiness, postural hypotension, and urinary urgency thereby increasing fall risk. ^[9]

Death or serious injury from a fall in a patient under treatment in a hospital setting is a never event for which the Centers for Medicare and Medicaid Services do not reimburse the hospitals for the additional costs associated with patient falls. ^[10]

Preventing falls in hospitalized patients through a three-step process including fall risk screening/assessment; tailored/personalized care planning and

consistent preventive interventions like universal precautions and tailored interventions to address patient-specific areas of risk are recommended evidenced based fall prevention strategies. [11]

The use of an integrative care management system in which the design of the facility is taken into account, proper communication between the different healthcare professionals is maximized, patients and next of kin are engaged in framing a tailor made patient specific fall prevention program and a systematic review of best practices and mistakes are evaluated at regular intervals to quantify the risk of certain triggering events for falls and review the actions taken to mitigate this risk are important aspects of preventing falls in a hospital. [12]

Monitoring the fall rates is the most relevant measure of how well a Fall Prevention Program is working in a hospital setting. The data can be successfully used in initiating a quality improvement effort and monitoring progress to sustain improvements. Falls per 1,000 occupied bed days is a standard measure for patient falls in hospital settings. [13]

Community based cross sectional studies to understand the epidemiology of falls and its consequences have been done across the globe and in Indian settings. [14-17]

However, there is a scarcity of data on Falls in Hospital settings in India which warrants the need for similar studies. With this objective the current study was undertaken.

The purpose of the study was to identify the factors associated with patient fall and to see the impact of intensifying interventions like tailored/personalized fall prevention strategies through engagement of patients and families as a part of collaborative communication in reduction of patient falls.

Hospital policy and Fall Prevention Program

The hospital has a robust Fall Prevention Policy in place. Processes aimed

towards patient fall prevention are in place at every stage from the point of entry to the hospital to discharge.

The hospital relies on the standard three step fall prevention program with engagement patients and families to reduce the risk of falls is as follows:

1. Fall risk screening/assessment
2. Tailored/personalized care planning
3. Consistent preventive interventions like Universal precautions and Tailored interventions to address patient-specific areas of risk

The patients with physical disability are assisted by the security and housekeeping staff at the emergency reception, main hospital lobby reception and day care lobby reception. The staffs provide patient trolleys or wheel chairs as appropriate.

A short Falls Risk Screening for Outpatient Department (OPD) is done at all OPD Clinics. A detailed fall risk assessment (Comprehensive Apollo Physiological Score-CAPS) is done for patients visiting the Orthopedics, Neurosciences and Physiotherapy department considering their inherent increased risk of fall and also for all Outpatient Dialysis and Day Care Chemotherapy patients, before and after the procedure. Radiotherapy patients have a daily assessment through the detailed fall risk assessment (Comprehensive Apollo Physiological Score-CAPS).

Identification of inpatients at risk of fall is done by the Physician (Based on medical condition), Nursing (Based on Nursing Admission Assessment and the CAPS – Falls Risk Assessment) and Multi-disciplinary Team (Based on Multi-disciplinary Assessment).

All patients are assessed for fall within 24 hours of admission using the CAPS – Fall Risk Assessment Tool. The reassessment for fall risk is done on each nursing shift thereafter. Fall risk assessment and scoring is done in recovery area following surgery and endoscopy procedures and noted in postoperative or procedure care plan.

Patients are classified as Low Fall risk if the score is from 0-50; Moderate Fall Risk if the score is from 51-100 and High Fall Risk if the score is 101-150. Targeted fall prevention strategies need to be devised through engagement of the patient and next of kin based on the Fall Risk Score.

This policy is keeping in consonance the need for fall risk screening at every patient admission and with each status change.

Nursing staff institutes falls risk strategies as per the risk status of the patients. This is documented in the nursing care plan.

The assessment includes the following parameter –

- i) Patient details, including Age (less than 16 or more than 65 years); Language or hearing barrier; Family Support; International Patients
- ii) Medication, including High risk drugs (Alcohol / anaesthetic / laxative / diuretic / Sedative & Anxiolytics / Antiepileptic / Antihypertensive); No. of drugs more than eight; and blood transfusion
- iii) Equipment , including Ventilator, Syringe / Infusion pump
- iv) Airway, including Tracheostomy / Endotracheal tube, Nasal cannula / Face Mask, or none
- v) Clinical, including High Risk Disease (Critical Care, Cardiac, Neurological or Oncology patients) and High Risk Surgery (Transplant, Onco surgery, Cardiac, Joint replacement and Neuro surgery)
- vi) History of fall in last 6 months
- vii) Secondary diagnosis
- viii) Ambulatory aid
- ix) IV / Helpock
- x) Gait / transferring
- xi) Mental Status

A “Safety First” sign board (Orange Board) is placed on the foot end of the bed (except for Children and ICU patients, as all these are vulnerable patients and Fall

Prevention strategies are applicable to them at all times).

Recommended universal precautions as per policy are as follows

1. Side rails to be raised for all patients. Patient and family to be informed and educated on need to raise side rails.
2. Safety First signage to be appropriately placed as applicable
3. Call Bells to be kept within patient’s reach
4. Toilet and Nutritional needs of the patient to be met
5. Transfer assistance to be provided with appropriate tagging to ensure proper communication of vulnerable patient.
6. Restraints to be applied whenever clinically indicated.
7. Environmental Control to be provided including
 - i) Floors to be kept dry in ward and toilet
 - ii) Patient to be educated not to walk holding the food trolley or other objects containing wheels
 - iii) Grab bars to be located properly in toilets and bathroom and
 - iv) Staff to ensure assistance during patient movement or walking.

Recommended Interventions following Patient Fall are as follows:

All patients to be assessed appropriately following fall as below

- a. Assessment for injuries (e.g. abrasion, contusion, laceration, fracture, head injury) and determine Level of Injury (No injury, Mild Injury, Moderate Injury, Major Injury).
- b. Obtaining and recording sitting / standing vital signs.
- c. Assessing for change in range of motion.
- d. Alerting Physician
- e. Documenting the circumstances in medical record
- f. Completing the incident report
- g. Assessing the intrinsic and extrinsic factors

- h. Notification of all team members of patient fall

Nursing Supervisors / Assistant Nursing Superintendent to conduct audits to check for compliance with falls prevention program.

Monitoring is done through the incident reporting of falls and calculation of the fall rate as Falls per 1,000 occupied bed days on a monthly basis. A detailed analysis is done by the Quality Assurance department against each Incident Report for a patient fall raised which includes the patient demographics, reasons for fall, time of fall, area where fall occurred and the level of injury.

Monitoring also includes routine audit of fall risk interventions during patient safety rounds.

Problem statement and interventions

A robust fall prevention policy does not ensure care team participation in all elements to reduce fall occurrence. ^[18]

It was observed that most nurses routinely completed the fall risk assessment. However, there were gaps in implementation of the universal fall prevention plan for all patients let alone building personalized care planning and engaging patients and families as a part of the three-step fall prevention process. Thus, the need for intensifying the training of nurses on the Fall Prevention Program and the need for a practice change for many nurses was felt.

Supporting nurses in this practice change was done with active involvement of the Quality Assurance Department and the Nursing Department and support from the Hospital Leadership and Director of Nursing.

The following interventions were done starting from June 2018:

- i.) We selected a team of thirty nursing in-charges from across the hospital and three Nursing Superintendents as “Fall Prevention champions” dedicated for the three hospital

buildings namely Main Building, Day care block and Oncology block.

- ii.) Regular training sessions were provided to the team on the existing policies and about the evidence behind patient engagement and the need for tailored intervention strategies.

- iii.) The culture of cross audits by the thirty core team members was introduced to find out implementation gaps across units and strengthen the program.

- iv.) Training sessions were also intensified at induction and also regular in-service nursing training sessions which were followed by evaluation sessions with a cut off pass mark of 50 percent.

- v.) Intensifying the Multi-disciplinary Team Round approach with an aim to identify the understanding and further training needs of the patients and next of kin in preventing patient falls.

- vi.) A WhatsApp group was created to facilitate communication and peer to peer feedback.

- vii.) The Facility Round Checklist was redesigned to incorporate points to facilitate tailored interventions to address patient-specific areas of risk.

MATERIALS AND METHODOLOGY

An observational retrospective study was conducted in a 700 bed multispecialty tertiary care hospital in Kolkata. A total of 96 patient falls were reported during the period from January 2017 to November 2019 which were considered in the study.

Once a patient fall occurs, it is reported by raising an Incident Report which comes to the Quality Assurance Department within 48 hours of the incident routed through the office of the Director of Nursing. The Quality Assurance staffs do a detailed event analysis through the Patient Fall Assessment Form with a main focus on the mechanism of fall, its consequences and ascertain whether the laid down hospital protocol was followed post fall. A detailed root cause analysis is done by the Quality Assurance department. The variables for the study namely patient demographics like age,

sex, mobility status, time of fall, area of fall, mechanism of fall, type of injury post fall were collected from the Incident Report Form and the Patient Fall Assessment Form.

Data for this study was entered into a computer based spreadsheet for analysis using SPSS (version 21) (IBM Corp., NY, USA). The statistical tests applied included descriptive statistics and chi-square tests for testing the association in any. *P value* <0.05 was considered statistically significant.

RESULTS

Fall rates are reported as total falls per 1,000 occupied patient bed-days. To calculate fall rates, the numerator (total number of falls for the reporting period) is multiplied by 1,000 and divided by the denominator (number of patient days). Fall and injury rates prior to and after intensifying the fall prevention strategies and incorporation of the patient centric tailored fall prevention strategies through engagement of patient and next of kin with an aim for collaborative communication were measured with a mean score.

We saw a sharp decline in the average fall rate from 0.18 per 1,000 occupied patient bed-days from January 2017 to May 2018 to 0.10 per 1,000 occupied patient bed-days from June 2018 to November 2019 which is a 44.44% decrease in the fall rate. The fall rate from January 2017 to November 2019 has been depicted in Figure 1.

Males constituted 53.12% (51 cases) of the falls while females constituted 46.88% (45 cases) of the falls. A chi-square test was performed to examine the association with sex and the fall rate. There was no statistically significant association between the two variables X^2 (1, N=96)=0.000, *p value*=0.574.

Of the fall cases, 34.38% (33 cases) were in the vulnerable age group (<16 years or ≥ 65 years) as per the hospital policy while the remaining 65.62% were in the age group from 16 to 64 years. The average age of the Fall cases was 56.41 years (Standard deviation ±20.18) and Range of 2 years to

88 years. Patients in the vulnerable age group of <16 years or ≥ 65 years sustained more falls than patients in the age group of 16 to 64 years and this difference was statistically significant, X^2 (1, N=96)=5.981, *p value* =0.046.

93.75% (90 patients) of the patients were mobile while 6.25% (6 patients) of the patients were immobile at the time of sustaining the fall. A Chi-square test done between the mobility status of the patient at the time of fall and the fall rate revealed patients who were immobile at the time of sustaining the fall were more prone to fall than mobile patients and this was statistically significant χ^2 (1, N=96)=9.137, *p value*=0.011.

78.12% (75 cases) of the falls occurred in presence of the attendant while 21.88% (21 cases) occurred in the absence of an attendant where the patient did not use the call bell to alert the nursing staff while moving out of the bed in an attempt to go to the toilet or leave the bed. Patients without attendants sustained more falls than patients who had attendants with them and this difference was statistically significant, X^2 (1, N=96)=8.981, *p value*=0.020.

As per Figure 2, post fall, 43.75% (42 cases) had no injuries, 46.87% (45 cases) had minor injuries like localized pain and swelling while 9.38% (9 cases) had moderate to major injuries ranging from cuts mainly on the forehead and lips requiring suturing, fracture, head injury and hematoma. Total 3.12% (3 cases) had fracture. All the patients sustaining injuries were treated and discharged home. The injuries post fall resulted in an additional 4.36 days of stay on an average (±2.21 Standard deviation).

As per Figure 3, 56.25% (54 cases) sustained a fall while going to the toilet, in the toilet after passing stool or urine or having completed bathing or returning to the bed from the toilet; 37.50% (36 cases) sustained a fall at the bedside while trying to come of the bed, while passing urine in the urine pot at the bedside, while sitting with legs dangling or while sitting on chairs

bedside the bed as advised by the physician; while 6.25% (6 cases) sustained a fall in the OPD or escalator or while walking along the

corridor as advised by the physician in presence of the attendant.

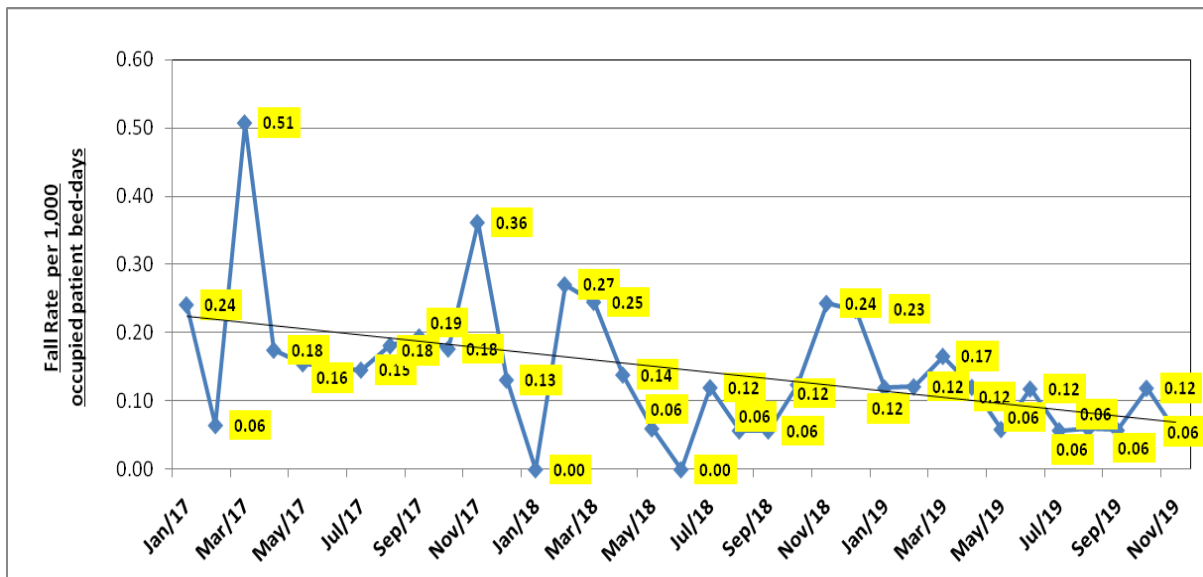


Figure 1: Fall rate per 1,000 occupied bed-days from January 2017 to November 2019

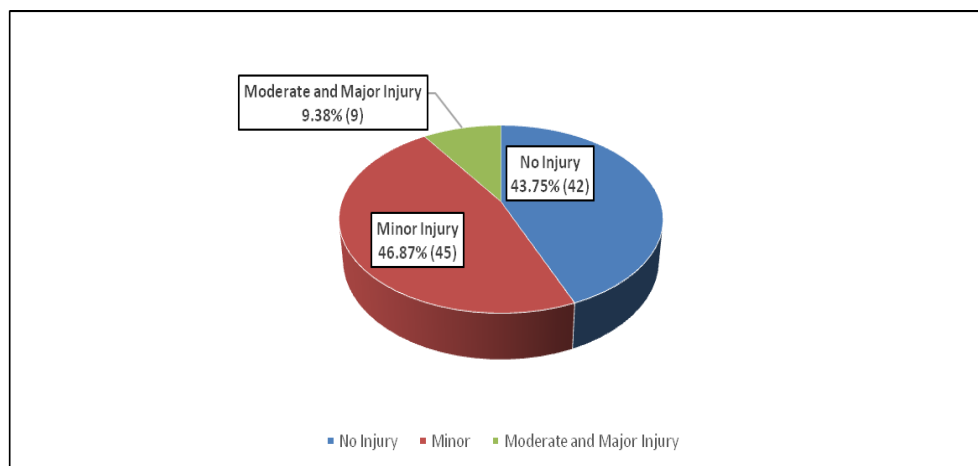


Figure 2: Injury Type of Patients post Falls (n=96)

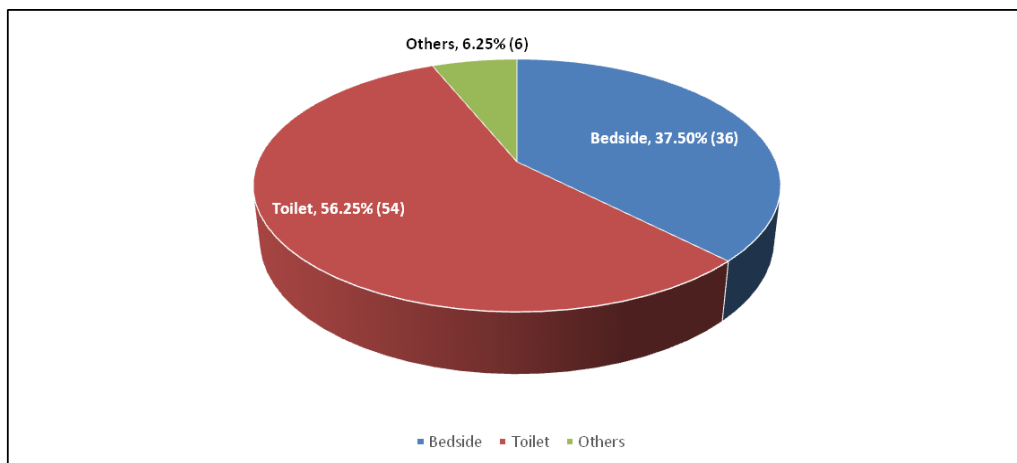


Figure 3: Location of Patients Falls (n=96)

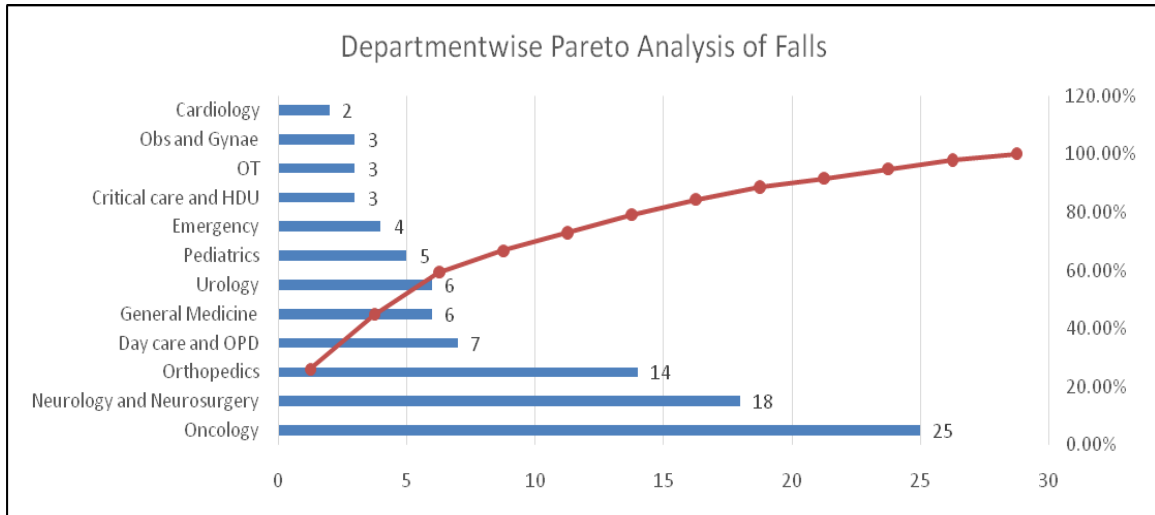


Figure 4: Department wise Pareto Analysis of Patient Falls (n=96)

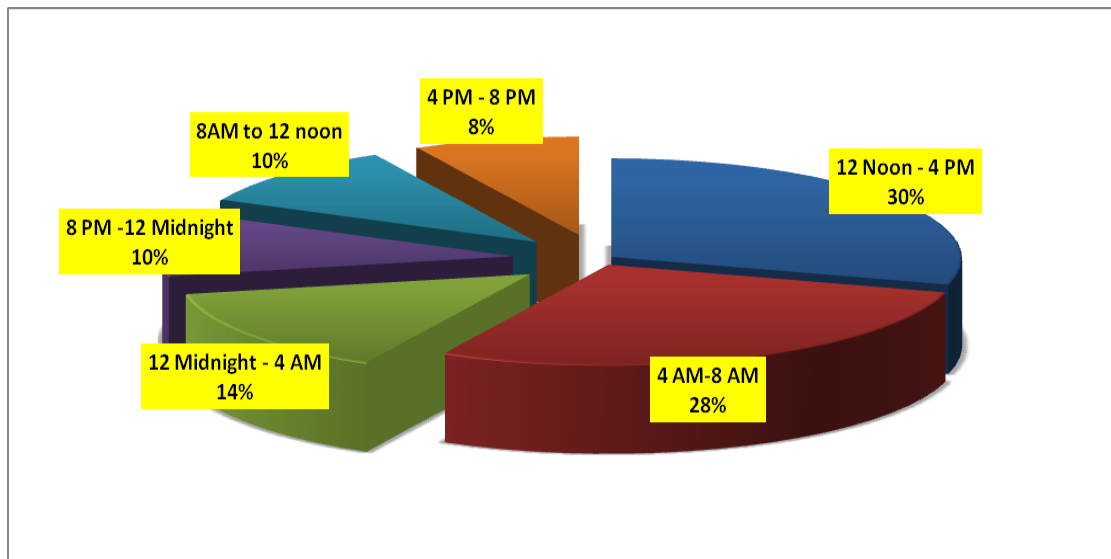


Figure 5: Time wise Distribution of Patient Falls (n=96)

Only 3.12% (1 case in Critical care and 2 cases in the High Dependency Unit) of the falls occurred in the Critical care settings, 3.12% (3 cases) of the falls occurred in the Operation theater, 4.16% (4 cases) of the falls occurred in the Emergency, 7.29% (7 cases) of the falls occurred in the Daycare and the Out Patient Department while the remaining 82.29% (79 cases) of the falls occurred in the wards. Oncology followed by Neurology and Neurosurgery, Orthopedics, Day care and OPD, General Medicine, Urology and Pediatrics contributed to 84.39% of the falls which is depicted in Figure 4.

Time wise distribution of the patient falls revealed that 30% of the falls occurred between 12 noon to 4 PM, 28% of the falls occurred between 4 AM to 8 AM, 14% of the falls occurred between 12 midnight to 4 AM, 10% of the falls occurred between 8 PM to 12 midnight and 8 AM to 12 noon each while 8% of the falls occurred between 4 PM to 8 PM. This is depicted in Figure 5. We could not conclude any statistically significant association between the time of fall and the fall rate through chi-square test $X^2(5, N=96)=1.937$, p value=0.122. This could be due to the small number of cases in each category. However from the descriptive data, we can conclude that

maximum number of falls occurred between 12 noon to 4 PM which is the silent hour in the hospital in the afternoon and between 4 AM to 8 AM, when the patients/attendants are asleep or less alert.

DISCUSSION

The fall rate in our study was less in comparison to other studies as mentioned earlier. This could be due to the structured Fall Prevention Program already running in the hospital for the last 8 years and also because of the thrust on the Fall Prevention Strategies from the Group Level.

However, studies revealed an overall decrease in the fall rate of 37% pre and post implementation of fall prevention strategies engaging patients and families. [19] This finding is in consonance with our study findings where we noted a 44.44% reduction in the fall rate through similar interventions.

Unlike other studies, which have reported higher fall rates in males we did not find any significant association between sex and the fall rate. In our study majority of the patients sustained fall in the toilet settings. Studies have observed falls happening more in bedside settings. Other findings from our study like falls occurring more in the vulnerable age groups, in the absence of the attendant and in the afternoon or early hours of the morning when the patients or attendants are in a state of compromised alertness are in consonance with the correlates of patient falls as identified in other studies. [20]

CONCLUSION

Patients may continue to fall and sustain injuries during their hospitalization despite a comprehensive fall prevention program in place. The role of a nursing staff trained in the hospital fall prevention strategies in preventing patient fall can in no way be demeaned. However, the importance of a collaborative multipronged approach adapted for fall prevention in a hospital setting is also of paramount importance. Moreover, collaborative communication by

incorporating patients and families in discussions related to fall risk and prevention and implementing a tailored patient specific program for fall prevention may effectively reduce fall rates. Thus empowering patients and families to become partners in the fall reduction program serves as an important component of a comprehensive safety program.

Limitation of the study

The sample size of the study was very small and the nature of the study (observational retrospective study) did not allow to have a large sample size.

Conflict of Interest

The authors declare there is no conflict of interest.

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