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Research Article

A comparative study on patient safety with reference to methods of detection of adverse events in a tertiary care hospital in North India

Moonis Mirza[1]*, Farooq A. Jan[2], Fayaz Ahmad Sofi[3], Rauf Ahmad Wani[4]

[1]Department of Hospital Administration, AIIMS, New Delhi, India
[2]Department of Hospital Administration SKIMS, J and K, India
[3]Department of Internal Medicine, SKIMS, J and K, India
[4]Department of General and Minimal Invasive Surgery, SKIMS, J and K, India

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***Correspondence:**
Dr. Moonis Mirza,
E-mail: moonismirza@gmail.com

ABSTRACT

Background: Considerable investments have been made to devise methods to detect actual and potential adverse events in health care in order to address risk and improve patient safety. Objective of the study was to compare the methods of detection of number of adverse events taking place in admitted patients.
Method: A prospective study for a period of one year. Three adverse events detection modules were studied, i.e. current record review, Incident reporting and cases discussed in Mortality Meets. A World Health Organization structured questionnaire on patient safety Review form-1 (RF-1) and Review form-2 (RF-2) was used. RF-1 form was used to screen adverse events. Screened positive patients were subjected to RF-2 form to calculate preventability of adverse events. Adverse events as well as preventability were compared to detect the preferred module of detection of errors in care.
Results: Current record review was able to detect 15.5% of adverse events with 71.33% preventability. Incident reporting module was able to detect only 0.73% of adverse events with 39% of preventability and mortality meets were able to study only 0.17% of adverse events with 47% of preventability.
Conclusion: Current record review was found to be preferred module of detection of adverse events.

Keywords: Current record review, Incident reporting, Mortality meets, Adverse events, Preventability

INTRODUCTION

Considerable investments have been made to devise methods to detect actual and potential adverse events in health care in order to address risk and improve patient safety. Most of this effort has been concentrated on systems of incident reporting which, once set up, are relatively low cost to maintain.[1]

Current record review estimates the point prevalence of adverse events. This method has the advantage of being more efficient, less time-consuming and easier to perform than the retrospective record review and of being able to identify current trends and problems in care rather than problems from the past calendar year.[2]

When error is discussed in the morbidity and mortality conference, the focus is often on an unexpected adverse outcome instead of events related to processes of care that might have contributed to the error.[3]

The aim of the study was to compare the methods of detection of number of adverse events taking place in admitted patients.

METHOD

A prospective study for a period of one year from 1st January 2013 to 31st December 2013 was carried out in admitted patients of Sheri-Kashmir Institute of Medical Sciences (SKIMS). Three adverse events detection modules were studied, i.e. current record review, Incident reporting and cases discussed in mortality meets. A WHO (World Health Organization) structured questionnaire on patient safety consisting of Review Form-1 (RF-1) and Review Form-2 (RF-2) was used in all the three groups. It was a two stage study.

In current record review all inpatients of general surgery and general medicine wards were subjected to the study. Researcher visited the wards on daily basis. RF-1 form was used to screen current records for any adverse events. Screened positive patients by RF-1 form were subjected to RF-2 form. A patient can have one or more adverse events present at the same time. A separate RF-2 form was filled for each adverse event screened positive. Interaction was also made with patient and staff on duty.

For incident reporting, any complaint and incident about adverse events happening anywhere in the hospital, reported by the patients, attendants, or staff to control room SKIMS, medical superintendent office or director's office were considered. Only inpatients were subjected to the study. Data was collected on daily basis.

The patient for whom incident was reported was taken as screened positive for having an adverse event. Medical records of the concerned patient were reviewed along with the patient and staff interaction. RF-1 form was filled for all the incidents reported. A patient can have one or more adverse event present at the same time. A separate RF-2 form was filled for every adverse event screened.

Mortality meets for a period of one year were noted down for the details of the patients and the adverse events. Mortality meet committee, comprising of various head of departments were involved in the selection of various files discussed in the meet. Patients discussed in mortality meets were considered as screened positive for having an adverse event. The researcher also reviewed medical records of the concerned cases. RF-1 form was filled for each case discussed in mortality meet. A patient can have one or more ad\verse event present at the same time. A separate RF-2 form was filled for every adverse event screened.

RESULTS

In the current record review of in-patients, 3150 patients were screened using RF-1 form. 488 (15.5%) patients were screened positive for having an adverse event. In incident reporting a total of 253 incidents of adverse events were reported from various parts of the hospital (0.73% of total admission among reported specialties in same year). For mortality meets a total of 62 meetings were conducted during the study period (0.17% of total admission among reported specialties in same year).

Comparing the age wise distribution among the positively screened patients, affected age group for adverse events included 21-40 years age group in current record review, 61 and above age group in incident reporting and 41-60 years age group in the cases discussed in mortality meets respectively (Figure 1).

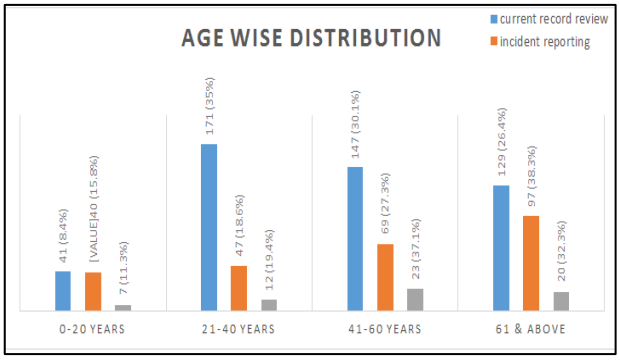

Figure 1: Age wise comparison of cases screened positive for adverse events.

Comparing the gender wise distribution among the positively screened patients in current record review, incident reporting and mortality meets, females were found to have more adverse events in all the three. (Figure 2).

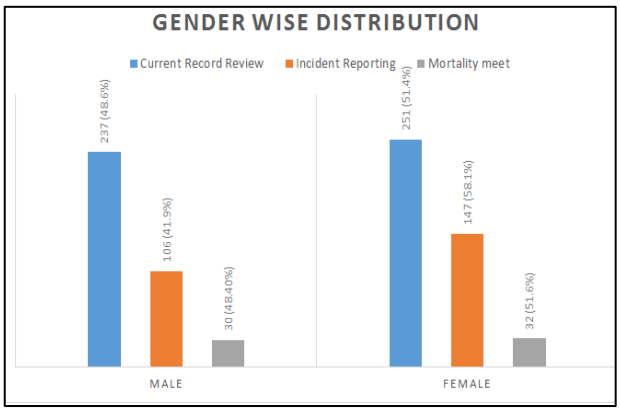

Figure 2: Gender wise comparison of cases screened positive for adverse events.

Comparing the type of admission, patients admitted through emergency were having more adverse events in all the three i.e. current record review, incident reporting and mortality meets (Figure 3).

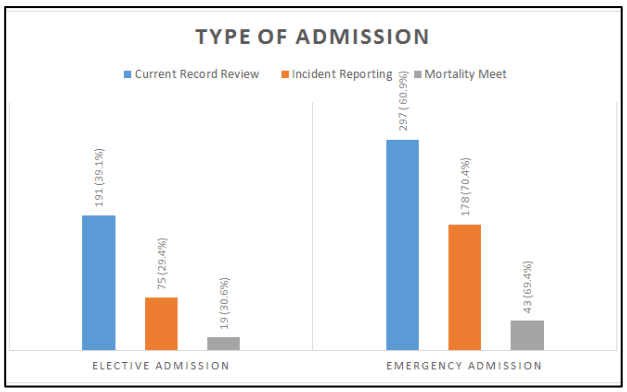

Figure 3: Type of admission wise comparison of cases screened positive for adverse events.

Cases screened positive for adverse events by current record review were mainly observed in patients with duration of stay of 11-20 days. Cases screened positive for Incidents reported and cases discussed in mortality meets mainly had 0-10 days of hospital stay (Figure 4).

Among 488 patients screened positive in current record review, most common indicator of adverse event having occurred was readmission during last 12 months related to any given healthcare for the same health condition (32.79%). Hospital acquired infection/sepsis was the second most common adverse event present (26.64%) (Table 1-4).

Among the incidents reported, most common indicator of adverse events having occurred was Patient/family dissatisfaction with care received/documented or expressed during the current admission and was 87.3%. Hospital acquired infection/sepsis was the second most common adverse event present (11.46%) (Table 1-4).

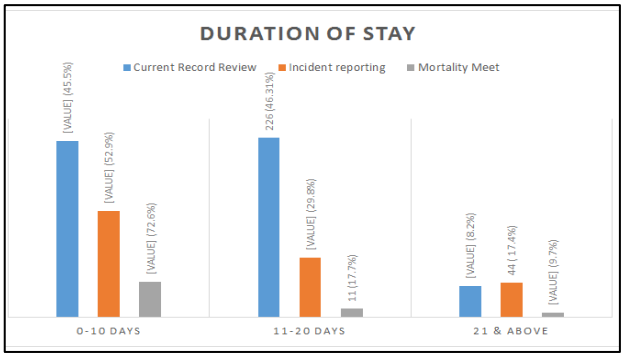

Figure 4: Duration of stay wise comparison of cases screened positive for adverse events.

Among the cases discussed in mortality meets, most common indicator of adverse event having occurred was Cardiac/respiratory arrest, low APGAR score (67.74%) followed by unexpected deaths due to adverse events (48.38%). Hospital acquired infection/sepsis was the third most common adverse event present (27.41%) (Table 1-4).

Table 1: Number of adverse events screened through RF-1 in current record review, incident reporting and mortality meets.

	Current record		Incident reporting		Mortality meet	
Screening Criterion	**No.**	**(%)**	**No.**	**(%)**	**No.**	**(%)**
Q1. During the last 12 months, any unplanned ward admission related to any given healthcare for the same health condition?	160	32.79	28	11.06	16	25.8
Q2. Hospital-incurred patient accident or injury?	50	10.24	6	2.37	0	0
Q3. Adverse drug reaction/drug error or related to administration of fluids or blood?	70	14.34	11	4.35	1	1.61
Q4. Hospital acquired infection/sepsis?	130	26.64	29	11.46	17	27.41
Q5. Unplanned removal, injury or repair of organ or structure during surgery, invasive procedure or vaginal delivery?	20	4.09	11	4.35	2	3.22
Q6. Unplanned return or visit to the operating theatre during this admission?	20	4.09	3	1.16	7	11.29
Q7. Unplanned open surgery following closed or laparoscopic surgery?	10	2.05	0	0	1	1.61
Q8. Cardiac/respiratory arrest, low APGAR score?	60	12.29	14	5.53	42	67.74
Q9. Development of neurological deficit not present on admission?	0	0	0	0	2	3.22
Q10. Injury or complications related to termination of pregnancy or labour and delivery including neonatal complications?	0	0	0	0	1	1.61
Q11. Other patient complications including MI, DVT, PE, CVA etc?	40	8.19	18	7.11	1	1.61
Q12. Patient/family dissatisfaction with care received documented or expressed during the current admission?	120	24.59	221	87.35	7	11.29
Q13. Unplanned transfer from general care to intensive care higher dependency?	20	4.09	3	1.16	9	14.52
Q14. Unplanned transfer to another acute care hospital?	0	0	0	0	0	0
Q15. Unexpected death (i.e. not an expected outcome of the disease during hospitalization)?	40	8.19	13	5.13	30	48.38
Q16. Patients care delayed or lesser treatment given because the patient was unable to pay?	0	0	21	8.3	8	12.9
Q17. Admission significantly prolonged compared to the expected length for this clinical condition?	20	4.09	5	1.98	2	3.22
Q18. Any other undesirable outcomes (not covered by any of the above)?	30	6.15	18	7.11	4	6.45
Total patients screened positive for adverse events	488		253		62	

Table 2: Spectrum of adverse events screened through RF1 in current record review.

	Age (in Years)				Gender		Type of Admission		Duration Of Stay (in Days)			Total
	0-20	21-40	41-60	≥61	Male	Female	Elective	Emergency	0-10	11-20	≥21	
Q1. Unplanned ward re-admission	20 (4.1%)	61 (12.5%)	29 (5.9%)	50 (10.2%)	60 (12.3%)	100 (20.5%)	61 (12.5%)	99 (20.3%)	51 (10.5%)	89 (18.2%)	20 (4.1%)	160
Q2. Hospital-incurred injury	0 (0%)	10 (2.1%)	30 (6.15%)	10 (2.1%)	30 (6.15%)	20 (4.1%)	10 (2.1%)	40 (8.2%)	30 (6.15%)	10 (2.1%)	10 (2.1%)	50
Q3. Adverse drug /blood reaction	0 (0%)	40 (8.2%)	20 (4.1%)	10 (2.1%)	30 (6.15%)	40 (8.2%)	50 (10.2%)	20 (4.1%)	10 (2.1%)	60 (12.3%)	0 (0%)	70
Q4. Hospital acquired infection	10 (2.1%)	60 (12.3%)	30 (6.15%)	30 (6.15%)	100 (20.5%)	30 (6.15%)	40 (8.2%)	90 (18.4%)	70 (14.4%)	50 (10.2%)	10 (2.1%)	130
Q5. Unplanned injury during surgery	0 (0%)	10 (2.1%)	10 (2.1%)	0 (0%)	0 (0%)	20 (4.1%)	0 (0%)	20 (4.1%)	10 (2.1%)	10 (2.1%)	0 (0%)	20
Q6. Unplanned return to the OT during this admission?	0 (0%)	10 (2.1%)	0 (0%)	10 (2.1%)	10 (2.1%)	10 (2.1%)	10 (2.1%)	10 (2.1%)	20 (4.1%)	0 (0%)	0 (0%)	20
Q7. Unplanned open surgery following laparoscopic surgery	0 (0%)	10 (2.1%)	0 (0%)	0 (0%)	0 (0%)	10 (2.1%)	0 (0%)	10 (2.1%)	10 (2.1%)	0 (0%)	0 (0%)	10
Q8. Cardiac/respiratory arrest or low APGAR?	10 (2.1%)	20 (4.1%)	30 (6.15%)	0 (0%)	30 (6.15%)	30 (6.15%)	20 (4.1%)	40 (8.2%)	20 (4.1%)	30 (6.15%)	10 (2.1%)	60
Q9. Development of neurological deficit?	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0(0%)	0
Q10. Injury or complications related to termination of pregnancy	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0(0%)	0
Q11. Other complications including MI, DVT, etc.	10 (2.1%)	0 (0%)	20 (4.1%)	10 (2.1%)	30 (6.15%)	10 (2.1%)	30 (6.15%)	10 (2.1%)	20 (4.1%)	20 (4.1%)	0 (0%)	40
Q12. Patient/family dissatisfaction?	0 (0%)	50 (10.2%)	50 (10.2%)	20 (4.1%)	50 (10.2%)	70 (14.4%)	50 (10.2%)	70 (14.4%)	50 (10.2%)	70 (14.4%)	0 (0%)	120
Q13. Unplanned transfer from general care to ICU	0 (0%)	20 (4.1%)	0 (0%)	0 (0%)	0 (0%)	20 (4.1%)	10 (2.1%)	10 (2.1%)	10 (2.1%)	10 (2.1%)	0 (0%)	20
Q14. Unplanned transfer to another hospital?	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0
Q15. Unexpected death	0 (0%)	10 (2.1%)	20 (4.1%)	10 (2.1%)	20 (4.1%)	20 (4.1%)	20 (4.1%)	20 (4.1%)	20 (4.1%)	20 (4.1%)	0 (0%)	40
Q16. Patients care delayed as unable to pay?	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0
Q17. Admission significantly prolonged	10 (2.1%)	0 (0%)	10 (2.1%)	0 (0%)	10 (2.1%)	10 (2.1%)	0 (0%)	20 (4.1%)	20 (4.1%)	0 (0%)	0 (0%)	20
Q18. Any other undesirable outcomes	0 (0%)	20 (4.1%)	10 (2.1%)	0 (0%)	10 (2.1%)	20 (4.1%)	10 (2.1%)	20 (4.1%)	20 (4.1%)	10 (2.1%)	0 (0%)	30

Table 3: Spectrum of adverse events among Incidents reported.

	Age (in years)				Gender		Type of admission		Duration of stay (in days)			Total
	0-20	21-40	41-60	≥61	Male	Female	Elective	Emergency	0-10	11-20	≥21	
Q1. Unplanned ward re-admission	6 (2.34%)	9 (3.51%)	7 (2.73%)	6 (2.34%)	10 (3.9%)	18 (7.02%)	12 (4.68%)	16 (6.24%)	15 (5.85%)	9 (3.51%)	4 (1.56%)	28
Q2. Hospital-incurred injury	0 (0%)	1 (0.39%)	5 (1.95%)	0 (0%)	2 (0.78%)	4 (1.56%)	2 (0.78%)	4 (1.56%)	5 (1.95%)	1 (0.39%)	0 (0%)	6
Q3. Adverse drug /blood reaction	6 (2.34%)	1 (0.39%)	0 (0%)	4 (1.56%)	3 (1.17%)	8 (3.12%)	2 (0.78%)	9 (3.51%)	4 (1.56%)	4 (1.56%)	3 (1.17%)	11
Q4. Hospital acquired infection	5 (1.95%)	1 (0.39%)	9 (3.51%)	14 (5.46%)	12 (4.68%)	17 (6.63%)	17 (6.63%)	12 (4.68%)	5 (1.95%)	9 (3.51%)	15 (5.85%)	29
Q5. Unplanned injury during surgery	1 (0.39%)	0 (0%)	5 (1.95%)	5 (1.95%)	6 (2.34%)	5 (1.95%)	5 (1.95%)	6 (2.34%)	4 (1.56%)	3 (1.17%)	4 (1.56%)	11
Q6. Unplanned return to the OT during this admission?	0 (0%)	3 (1.17%)	0 (0%)	0 (0%)	1 (0.39%)	2 (0.78%)	2 (0.78%)	1 (0.39%)	2 (0.78%)	1 (0.39%)	0 (0%)	3
Q7. Unplanned open surgery following closed or laparoscopic surgery	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0
Q8. Cardiac/respiratory arrest or low APGAR?	0 (0%)	5 (1.95%)	3 (1.17%)	6 (2.34%)	6 (2.34%)	8 (3.12%)	2 (0.78%)	12 (4.68%)	7 (2.73%)	5 (1.95%)	2 (0.78%)	14
Q9. Development of neurological deficit?	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0
Q10. Injury or complications related to termination of pregnancy	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0
Q11. Other complications including MI, DVT, etc.	4 (1.56%)	2 (0.78%)	8 (3.12%)	4 (1.56%)	7 (2.73%)	11 (4.29%)	3 (1.17%)	15 (5.85%)	7 (2.73%)	6 (2.34%)	5 (1.95%)	18
Q12. Patient/family	33 (12.9%	41 (15.9%	60	87(33.9%)	93(36.3%)	128(49.9%)	66(25.7%)	155(60.4%)	116	68	37 (14.4%)	221

dissatisfaction?			(23.4%)						(45.2%)	(26.5%)		
Q13. Unplanned transfer from general care to ICU	1(0.39%)	0 (0%)	0 (0%)	2 (0.78%)	2 (0.78%)	1 (0.39%)	0 (0%)	3(1.17%)	1(0.39%)	1(0.39%)	1(0.39%)	3
Q14. Unplanned transfer to another hospital?	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0
Q15. Unexpected death	0 (0%)	4 (1.56%)	3 (1.17%)	6 (2.34%)	4 (1.56%)	9 (3.51%)	4 (1.56%)	9 (3.51%)	6 (2.34%)	5 (1.95%)	2 (0.78%)	13
Q16. Patients care delayed as unable to pay?	5 (1.95%)	3 (1.17%)	4 (1.56%)	9 (3.51%)	9 (3.51%)	12 (4.68%)	4 (1.56%)	17 (6.63%)	17 (6.63%)	3 (1.17%)	1 (0.39%)	21
Q17. Admission significantly prolonged	1 (0.39%)	2 (0.78%)	1 (0.39%)	1 (0.39%)	1 (0.39%)	4 (1.56%)	4 (1.56%)	1 (0.39%)	1(0.39%)	1 (0.39%)	3 (1.17%)	5
Q18. Any other undesirable outcomes	2 (0.78%)	2 (0.78%)	6 (0.78%)	8 (3.12%)	3 (1.17%)	15 (5.85%)	4 (1.56%)	14 (5.46%)	14 (5.46%)	3 (1.17%)	1 (0.39%)	18

Table 4: Spectrum of adverse events screened through RF1 among cases discussed in mortality meets.

Q1. Unplanned ward re-admission	**1 (1.61%)**	**3 (4.83%)**	**7 (11.3%)**	**5 (8.05%)**	**6 (9.66%)**	**10 (16.1%)**	**5 (8.05%)**	**11 (17.7%)**	**12 (19.3%)**	**4 (6.44%)**	**0 (0%)**
Q2. Hospital-incurred injury	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Q3. Adverse drug /blood reaction	0 (0%)	1 (1.61%)	0 (0%)	0 (0%)	1 (1.61%)	0 (0%)	0 (0%)	1 (1.61%)	1 (1.61%)	0 (0%)	0 (0%)
Q4. Hospital acquired infection	1 (1.61%)	4 (6.44%)	6 (9.66%)	6 (9.66%)	10 (16.1%)	7 (11.3%)	7 (11.3%)	10 (16.1%)	11 (17.7%)	4 (6.44%)	2 (3.22%)
Q5. Unplanned injury during surgery	0 (0%)	1 (1.61%)	1 (1.61%)	0 (0%)	0 (0%)	2 (3.22%)	1 (1.61%)	1 (1.61%)	1 (1.61%)	0 (0%)	1 (1.61%)
Q6. Unplanned return to the OT during this admission?	1 (1.61%)	2 (3.22%)	3 (4.83%)	1 (1.61%)	7 (11.3%)	0 (0%)	4 (6.44%)	3 (4.83%)	4 (6.44%)	2 (3.22%)	1 (1.61%)
Q7. Unplanned open surgery following closed or laparoscopic surgery	0 (0%)	0 (0%)	1 (1.61%)	0 (0%)	1 (1.61%)	0 (0%)	0 (0%)	1 (1.61%)	0 (0%)	1 (1.61%)	0 (0%)
Q8. Cardiac/respiratory arrest or low APGAR?	4 (6.44%)	6 (9.66%)	15 (24.2%)	17 (27.4%)	22 (35.4%)	20 (32.2%)	12 (19.3%)	30 (48.3%)	34 (54.7%)	6 (9.66%)	2 (3.22%)
Q9. Development of neurological deficit?	0 (0%)	0 (0%)	1 (1.61%)	1 (1.61%)	0 (0%)	2 (3.22%)	0 (0%)	2 (3.22%)	2 (3.22%)	0 (0%)	0 (0%)
Q10. Injury or complications related to termination of pregnancy	0 (0%)	0 (0%)	1 (1.61%)	0 (0%)	1 (1.61%)	0 (0%)	0 (0%)	1 (1.61%)	1 (1.61%)	0 (0%)	0 (0%)
Q11. Other complications including MI, DVT, etc.	0 (0%)	0 (0%)	1 (1.61%)	0 (0%)	1 (1.61%)	0 (0%)	1 (1.61%)	0 (0%)	1 (1.61%)	0 (0%)	0 (0%)
Q12. Patient/family dissatisfaction?	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Q13. Unplanned transfer from general care to ICU	2 (3.22%)	2 (3.22%)	4 (6.44%)	1 (1.61%)	4 (6.44%)	5 (8.05%)	5 (8.05%)	4 (6.44%)	4 (6.44%)	5 (8.05%)	0 (0%)
Q14. Unplanned transfer to another hospital?	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Q15. Unexpected death	4 (6.44%)	3 (4.83%)	13 (20.9%)	10 (16.1%)	15 (24.2%)	15 (24.2%)	11 (17.7%)	19 (30.6%)	21 (33.8%)	6 (9.6%)	3 (4.83%)
Q16. Patients care delayed as unable to pay?	2 (3.22%)	0 (0%)	3 (4.83%)	3 (4.83%)	2 (3.22%)	6 (9.66%)	2 (3.22%)	6 (9.66%)	5 (8.05%)	2 (3.2%)	1 (1.61%)
Q17. Admission significantly prolonged	0 (0%)	0 (0%)	1 (1.61%)	1 (1.61%)	0 (0%)	2 (3.22%)	0 (0%)	2 (3.22%)	1 (1.61%)	1 (1.6%)	0 (0%)
Q18. Any other undesirable outcomes	0 (0%)	0 (0%)	1 (1.61%)	3 (4.83%)	1 (1.61%)	3 (4.83%)	0 (0%)	4 (6.44%)	3 (4.8%)	0 (0%)	1 (1.6%)

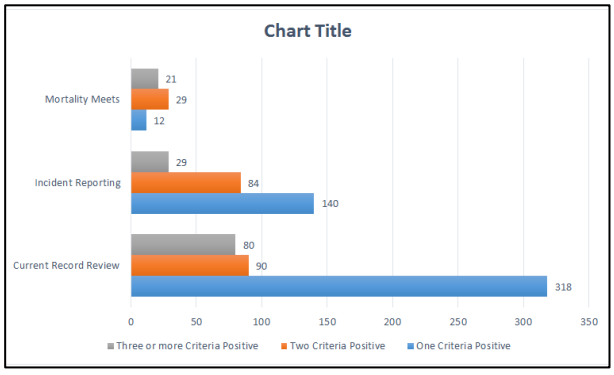

Figure 5: Number of criteria screened positive in current record review, incident reporting and mortality by RF 1 form.

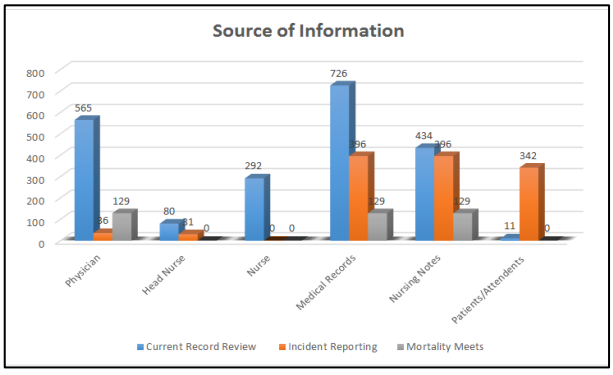

Figure 6: Source of Information of adverse events in Current Record Review, Incident Reporting and cases discussed in mortality meets.

A patient can have one or more adverse event present at the same time. Separate RF-2 form was filled for each screened positive adverse event. Current record review and Incident reporting were having mainly one screening criteria positive. In cases discussed in mortality meet, two screening criteria were mainly present (Figure 5).

Source of information of adverse events in current record review, incident reporting and cases discussed in mortality meets varied widely (Figure 6).

Not all adverse events were present with an untoward outcome. Some adverse events either have no untoward visible outcome or the outcome is so minor that it goes unnoticed. Implication of each adverse event on Outcome was reviewed through RF-2 form. Current record review and cases discussed in mortality meets were having more untoward outcome as compared to incident reporting. (Figure 7 and Table 5).

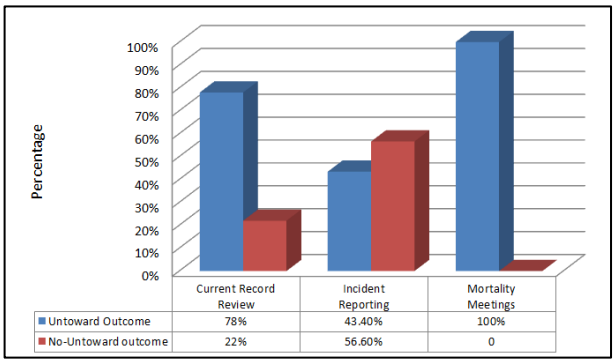

Figure 7: Comparison among the outcomes of adverse events using different methods (percentage).

Table 5: Implication of adverse event on outcome in different modules.

	Current Record Review		Incident Reporting		Mortality Meets	
Outcome	Number	percentage	Number	percentage	Number	percentage
Adverse Event causing Admission in ward	472	81.80%	78	34.80%	43	33.30%
Adverse Event associated with Death	25	4.33%	55	24.60%	126	97.70%
Adverse Event associated with Disability at Discharge	135	23.40%	64	28.60%	0	0%
Adverse Event associated with prolonged Stay	205	35.50%	109	48.70%	42	32.60%

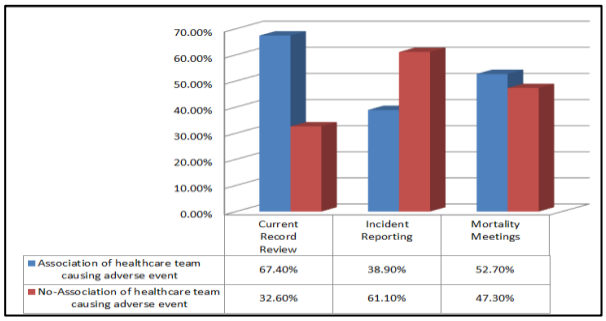

Figure 8: Showing comparison of evidence that healthcare team caused adverse event using different methods (percentage).

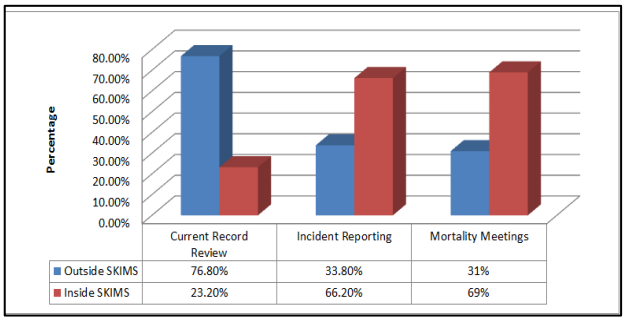

Figure 9: Location of adverse events by different methods (Percentage).

Table 6: Evidence that healthcare team caused adverse event using different methods.

	Current Record Review		Incident Reporting		Mortality Meets	
Outcome	Number	percentage	Number	percentage	Number	percentage
Association of healthcare team causing Adverse event	496	67.40%	154	38.90%	68	52.70%
No Association of healthcare team causing Adverse event	240	32.60%	242	61.10%	61	47.30%

Adverse events studied through RF2 form in current record review showed highest signs of health care team responsible for causing adverse events which could have been prevented amongst all the adverse events detection modules (Figure 8 and Table 6).

Adverse events either occurred during the index admission or the adverse event had already taken place somewhere else and the patient is either referred to or comes by its own to the studied hospital. Incident reporting and mortality meet cases revealed that most errors occur outside the studied hospital but the current record review revealed that most errors occurred during the index admission (Figure 9, Table 7 and Table 8).

Table 7: Exact location of adverse event taking place outside SKIMS.

	Current Record Review		Incident reporting		Mortality meets	
	No.	%	No.	%	No.	%
Public Hospital	325	85.30%	22	42.30%	10	45.50%
Private Hospital	5	1.30%	7	13.50%	8	36.40%
Primary Healthcare	51	13.40%	23	44.20%	4	18.20%

Table 8: Exact location of adverse event taking place inside SKIMS.

	Current record review		Incident reporting		Mortality Meets	
Theatres	30	26.10%	22	22%	19	39.60%
ICU	20	17.40%	17	17%	10	20.80%
Wards	60	52.20%	26	25%	5	10.40%
Accident and emergency	5	4.30%	36	35%	9	18.80%
Service area	0	0%	1	1%	0	0%
Radiology	0	0%	0	0%	3	6.30%
Don't Know	0	0%	0	0%	2	4.20%
Total	115		102		48	

Table 9: Type of care related to adverse events.

	Current record review		incident reporting		Mortality Meets	
	No.	%	No.	%	No.	%
Prevention and prophylaxis	30	6%	3	1.90%	4	5.60%
Diagnostic	86	17.30%	65	42.20%	20	28.20%
Therapeutic	380	76.60%	86	55.80%	46	64.80%
Rehabilitation	0	0%	0	0%	1	1.40%

Table 10: Confidence score of preventability among adverse events.

Confidence Score		Frequency		
		Current Record review	incident reporting	mortality meets
Virtually no evidence for preventability	1	49 (6.7%)	95 (24.0%)	10 (7.8%)
Slight to modest evidence for preventability	2	96 (13.0%)	77 (19.4%)	27 (20.9%)
Preventability not really likely; less than 50-50	3	66 (9.0%)	70 (17.7%)	32 (24.8%)
Preventability more likely than not; more than 50-50	4	299 (40.6%)	65 (16.4%)	20 (15.5%)
Strong evidence for preventability	5	196 (26.6%)	59 (14.9%)	29 (22.5%)
Definite certain evidence for preventability	6	30 (4.1%)	30 (7.60%)	11 (8.5%)

Adverse events were related to therapeutic care of patient followed by the diagnostic care in all the three adverse event detection modules (Table 9).

Preventability is calculated on the basis of confidence score set by WHO in RF-2 form of preventability. Confidence score ≥4 is considered preventable. Preventable errors were mainly seen by current record review. Incident reporting and cases discussed in

mortality meets were mainly non-preventable (Table 10 and Figure 10).

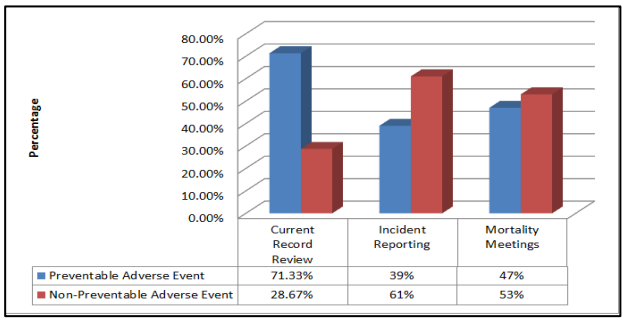

Figure 10: Overall preventability in adverse events using different methods.

DISCUSSION

In the present study, Current record review was able to detect 15.5 % of adverse events which is comparable to other similar studies.[4-8] Few studies using the similar detection tool were able to detect even higher rate of error.[9-11] While incident reporting module was able to detect only 0.73% of adverse events, similarly mortality meets were able to study only 0.17% of adverse events.

In our study by current record review among inpatients, 71.33% of studied adverse events were found to be preventable which stands comparable to various studies.[4,12-15] While in incident reporting only 39 % of adverse events were found preventable. Also only 47% adverse events discussed in mortality meets were found preventable.

CONCLUSION

As concluded from the present study, current record review stands to be the preferred tool to detect adverse events in admitted patients. A combination of all the three modules is always a better option. More and more such studies need to be carried out in developing countries to assess the magnitude of adverse events taking place in patients and thereby increasing awareness among healthcare providers and in turn improving patient safety.

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