

# EFFECT OF SURPRISE INSPECTIONS ON THE CLEANLINESS OF INPATIENT AREAS OF A TERTIARY CARE HOSPITAL

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## 1. INTRODUCTION

Housekeeping refers to the cleaning and upkeep of the hospital premises which renders the environmental surfaces safe to handle by removing organic matter, salts and visible soils [1,2].

Provision of a clean environment in hospitals is important for both patient and staff safety [3]. Good housekeeping services ensure that the quality of cleaning meets appropriate infection prevention and control best practices [4]. Good housekeeping and reduction of Hospital Acquired Infections (HAIs) and average length of stay (ALOS) are strongly related [1, 5] and public also perceive that there is a clear link between cleanliness standards and the risk of contracting an infection while in hospital. It also influences their decision to choose a hospital (esp. environment and physical cleanliness) [6].

Thus, cleanliness becomes a priority both in terms of its role in reducing the number of infections and public's perception. But unfortunately, the level of cleanliness remains poor in the public hospitals and indoor admitted patients are dissatisfied with cleanliness of toilets/bathrooms (84%), ward (70%) and surroundings (80%) [7]. Higher satisfaction with aesthetics is associated with higher satisfaction with health care services [8].

The apex tertiary care hospital under study has over 1000 inpatient beds, an average daily OPD load of 5000 patients per day and an Emergency Department with an average daily load of 300-400 patients per day. The housekeeping services of the hospital are completely outsourced (manpower, cleaning equipment and material). Patient satisfaction at the hospital in the previous studies with respect to the cleanliness of washrooms were found to be at 38.8% [9] and 65% [10] respectively and w.r.t to cleanliness of wards were found to be at 75% (9) and 83% [10] respectively.

Controlling is an essential aspect of the sourcing which is done through contract and partnership management (11) with prescribed detailed instructions and procedures for this purpose [12]. There must remain in place a secure method to hold the contractor to an agreed upon standard of excellence [13] and a team must monitor activity reviewing performance indicators on set quality parameters to yield a transparent view [14, 15]. Concerned authorities in the hospital should be involved throughout in the conduct of the contract and continuously monitor the performance of the contractor [11].

**BACKGROUND:** Good housekeeping plays an important role not only for patient satisfaction, its role in prevention of hospital acquired infections has been established beyond doubt. Satisfaction surveys are ways to finding patients' perception of cleanliness, but for improving cleanliness accountability and monitoring performance play important role.

**AIM:** The objective of this study was to evaluate the impact of random surprise visual inspections/audits on cleanliness in the in-patient wards of a tertiary care hospital in the National Capital Territory, India.

**METHODS:** Surprise inspections/audits were conducted based on key performance indicators to objectively assess the cleanliness at variable intervals of time in the various patient care areas like medical, paediatric, surgical, and critical care units. The areas were sub-classified into staff, patient and common sub-areas each with measurable element like cleaning of toilets, cleaning equipment, patient beds, etc. for which "yes" (=1) or "no" (=0) was marked. Percentages were calculated for the scores achieved. Analysis for Chi square linear trend in proportions was also done. Data which were non-normally distributed in two groups Wilcoxon sign rank test was used.

**RESULTS:** Deficiencies observed in the first audit were poor general cleaning of toilets, non-availability of supplies, poor general cleanliness of nursing station, office and sanitation equipment, staff duty room, walls, floors, window panes, window sills, bedside screens and tables, curtains and fixtures. As audits progressed, there was a steady progress in the cleanliness observed, overall scores progressed from 47 % in August (n=1), 60 % in September (n=05), 78 % in October (n=11), 83 % in November (n=04) but dipped to 76% in December (n=07).

**CONCLUSION:** Regular surprise hospital cleanliness inspections/audits led to significant improvement of cleanliness which was then sustained till the inspections were carried.

**Keywords:** hospital, audit, cleaning, India

In this apex tertiary care hospital, certain key performance indicators (KPI) /parameters were defined in the tender terms and agreement to assess the functioning of the outsourced agency. These were monitored by monthly and daily reports that were to be submitted to the Hospital Administration. The implementation of checklists, and methods to measure the effectiveness of cleaning with immediate feedback to housekeeping services personnel has been found to improve cleaning and lead to a reduction in healthcare-associated infections [16]

Effective control of hospital infections requires good housekeeping which includes cleaning of walls, floors, window panes, window sills, bedside screens and tables, curtains and fixtures including bathroom fixtures as a scheduled programme at predetermined intervals with use of appropriate disinfectants [4]. The KPIs of housekeeping services are also on similar lines.

Audit is a key function of infection control teams and it should include audits of cleanliness of hospital environment [17]. Audit and feedback can be effective in improving professional practice although effects are generally small to moderate. The absolute effects of audit and feedback are more likely to be larger when baseline adherence to recommended practice is low [16], when the source is a supervisor or colleague, it is provided more than once, delivered in both verbal and written formats, and when it includes both explicit targets and an action plan [19, 20].

Earlier studies showed poor patient satisfaction with regards to the housekeeping services at the tertiary care hospital, despite services being outsourced. These studies were based on perception of patients with regards to cleanliness. Introduction and monitoring of the KPIs with results communicated to the stakeholders [16, 19, 20] is the essence to establish the quality of the services being rendered by the outsourced agency. Thus, when the tender for outsourcing of sanitation services was floated in 2013, it included measurement of cleanliness based on objective key performance indicators (KPIs). These KPIs included discrete aspects like no litter, no surface stains, no dust, and no odour in all the areas of the hospital & it offered objectivity to assessment. These KPIs were linked with stringent penalty clauses. The KPIs were monitored by fortnightly/monthly performance reports generated by respective nurse manager of inpatient areas. It was noticed that over a period of time, complacency set in the system as it was observed that in spite of having satisfactory fortnightly/monthly performance reports, feedbacks were received from patients & doctors that the cleanliness was not satisfactory in some of these areas. This raised doubts on the reliability of the fortnightly/monthly reports designed to improve performance by linking these with penalty clauses. It was then decided to conduct surprise inspection of the areas by a team as an additional measure to bring further improvement in cleanliness of the hospital inpatient areas. This study aims to measure the effect of surprise inspections/audits on cleanliness by a team.

## 2. METHODS

A prospective interventional after only study [2] was done in a 1000 bedded tertiary care hospital. This design was taken as there was no baseline data available [21] and any efforts to measure cleanliness in inpatient areas would have itself led to Hawthorne effect and baseline data would have been different than actual. The control group was not considered as even a single surprise inspection was expected to improve the performance of the **contractor** responsible for cleanliness.

### 2.1. Study Areas

These were the in-patient areas of the hospital viz employees' and other wards, HDU and ICU of surgery, medicine, pediatric, emergency in-patient, gastrointestinal surgery, gastroenterology, orthopedics, nephrology specialties.

The audits were done by a team comprising of representative from the Dept. of Hospital Administration, nurse managers like Deputy Nursing Superintendent (DNS) and Assistant Nursing Superintends, Sanitation Officer, Facility Managers and area supervisors of the outsourced agency. The in-patient areas and days of audit were randomly selected by the administrators and these were conducted between 9am to 5pm which were the regular official hours. Randomisation of the areas to be inspected for cleanliness was achieved by use of random number table on the enumerated inpatient areas. On two days, audits (n=3) were conducted during the early morning hours. Inspection was initiated right from approach to selected area like staircases, corridors, outer windows, exhausts and fire exits

to point of entry to area like the door, inner corridors and various elements in other common, patient and staff in-patient areas.

### 2.2. Data Collection tool

A checklist for objective assessment of the housekeeping services was devised based on the key performance parameters enlisted in the tender document for outsourcing of the housekeeping services. The areas were further sub-classified into 3 sub-areas namely "patient area", "staff area" and "common area" which were further sub-divided into elements which are as under:

The elements were inspected visually for litter, surface stains, dust or odour. If these were not observed, a 'Yes' was marked and if these were observed, 'No' was marked.

All stakeholders were also counselled and issues addressed if reported. They were also informed that a re-visit would be done to re-evaluate the area. To maintain the element of surprise, at times, multiple areas audited on the same day. This study was carried over a period of 5 months from August 2014 to December 2014.

### 2.3. Analysis

Since the data thus generated was a nominal categorical data, percentages were calculated for the scores achieved. Analysis for Chi square linear trend in proportions for selected audit dates with frequencies approximating to 3-4 days interval or next available reading using Epi-Info Version 6 was also done. Data which were non-normally distributed in two groups Wilcoxon sign rank test was used.

## 3. RESULTS

In total, 28 audits were conducted involving 18 areas. Audits during the first two months had poor scores which were 47%, 32%, 47%, 67%, 89%, 65%, 33% and 52%. Deficiencies observed in the first audit were poor general cleaning of toilets, non-availability of toilet supplies, poor general cleanliness of nursing station, office and sanitation equipment, staff duty room, doors and windows including glasses, window grills in corridors and poorly mopped side walls. Last 3 months - During the subsequent period, the scores were better which were 71%, 86%, 91%, 94%, 81%, 81%, 91%, 86%, 91%, 90%, 76%, 71%, 95%, 62%, 91%, 86%, 58%, 76%. It was observed that the scores were sustained above 80 % with an average of 82% over the next 3 months. The final month of December witnessed a dip after a fairly sustained good performance.

About 13 elements scored more than 70%. (Table 1 and Figure 1) Worst cleaned elements (scores) included cleaning and wet mopping of fans and exhaust fans (67%), doors, windows, including glasses (64%), damp dusting of the window glass (64%), dry and wet mop of side walls up to tile area (64%), cleaning of toilets (general hygiene and odour) (62%), cleaning of patient care areas (beds, lockers, etc.) (57%), cleaning of sanitation equipment (57%), cleaning of window grills in corridors and windows (57%).

Figure 1. Ranked percentage score of each element of ward inspected

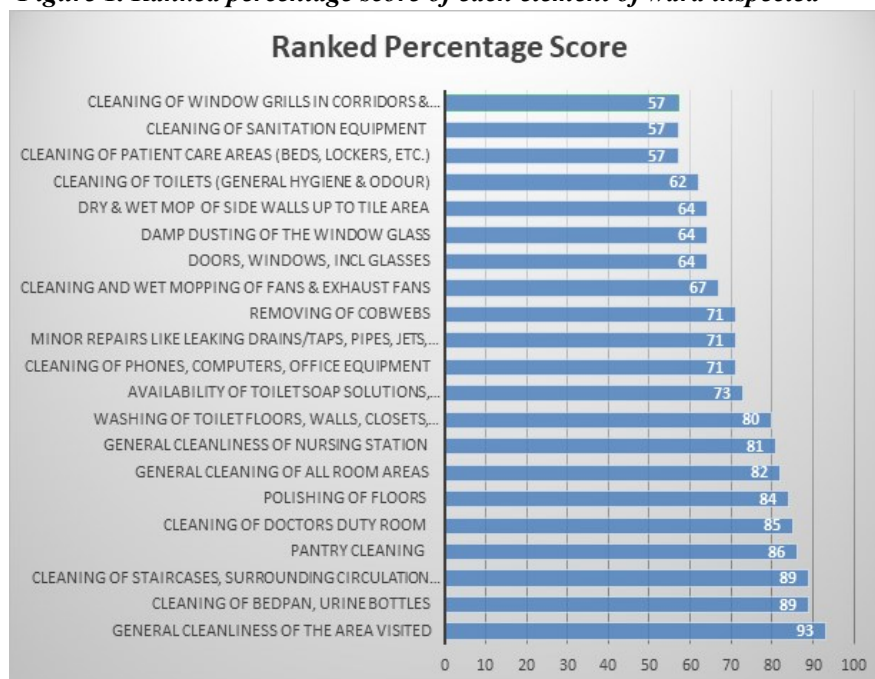


Table 1. Ranked score of elements inspected

Element	Area	Score	Out of Audited	Percentage Score
General cleanliness of the area visited	C	26	28	93
Cleaning of Bedpan, urine bottles	P	23	26	89
Cleaning of staircases, surrounding circulation areas	C	24	27	89
Pantry cleaning	P	24	28	86
Cleaning of doctors duty room	S	23	27	85
Polishing of floors	C	21	26	84
General cleaning of all room areas	C	22	27	82
General cleanliness of nursing station	S	25	28	81
Washing of toilet floors, walls, closets, urinals, wash basins, fixtures	P	20	25	80
Availability of toilet soap solutions, naphthalene balls and urinal cakes, mugs	P	19	26	73
Cleaning of phones, computers, office equipment	S	20	28	71
Minor repairs like leaking drains/taps, pipes, jets, etc	S	20	28	71
Removing of cobwebs	C	20	28	71
Cleaning and wet mopping of fans and exhaust fans	C	16	24	67
Doors, windows, incl glasses	C	18	28	64
Damp dusting of the window glass	C	18	28	64
Dry and wet mop of side walls up to tile area	C	18	28	64
Cleaning of toilets (general hygiene and odour)	P	16	26	62
Cleaning of patient care areas (beds, lockers, etc.)	P	16	28	57
Cleaning of sanitation equipment	S	16	28	57
Cleaning of window grills in corridors and windows	C	16	28	57

On about 10 days, two visits were made one in the morning followed by one in the afternoon. The score was low in the first visit and significantly higher in the second visit. (p 0.016) (Table 2) As audits progressed, there was a steady improvement in the cleanliness observed, overall average scores progressed from 47 % in August (n=1), 60 % in September (n=05), 78 % in October (n=11), 83 % in November (n=04) but there was a dip to 76% in December (n=07), the increase was significant. (p<0.01) (Table 3 and Figure 2) Scores of all three sub-areas viz patient, staff and common areas improved in the months of October and November with a dip in the month of December (Table 4). Average (range) cleanliness score for patient areas improved from 67 % in the first audit to 80 % (50% -100%) in the months of October and November with a dip in the month of December to 71% (33% -100%), and the increase was significant (p 0.05) (Figure 3) Staff Area average (range) cleanliness score improved from 0 % in the first audit to 81% (40% -100%) and 95 % (80% -100%) in the months of October and November respectively with a dip in the month of December to 69% (20% -100%), and the increase was significant (p<0.01) Common Area average (range) cleanliness improved from 63 % in the first audit to 75% (20% -100%), in the month of October to 80 % (50% -100%) in the months of November and December. The average (range) scores increased from 47% in the first audit to overall average of 73.76% (32%- 95%), and the increase was significant (p<0.01)

#### 4. DISCUSSION

The result of regular surprise audits were significant increase in scores in all areas combined and even in separate areas. Earlier patient satisfaction at the hospital in the previous studies with respect to the cleanliness of washrooms were found to be at 38.8% [9] and 65% (10) respectively and w.r.t to cleanliness of wards were found to be at 75% [9] and 83% [10] respectively.

The result was similar to the present study. Our study used a group of experienced auditors, and the checks were random. These surprise visual inspections acted as an objective assessment/evaluation of performance of outsource agency for housekeeping services as its effectiveness while on the other hand it was expected to create an environment of accountability on the part of responsible stakeholders and a mechanism of monitoring, feedback and counselling mechanism on the part of administrators.

Figure 2. Average cleanliness in percentage by month

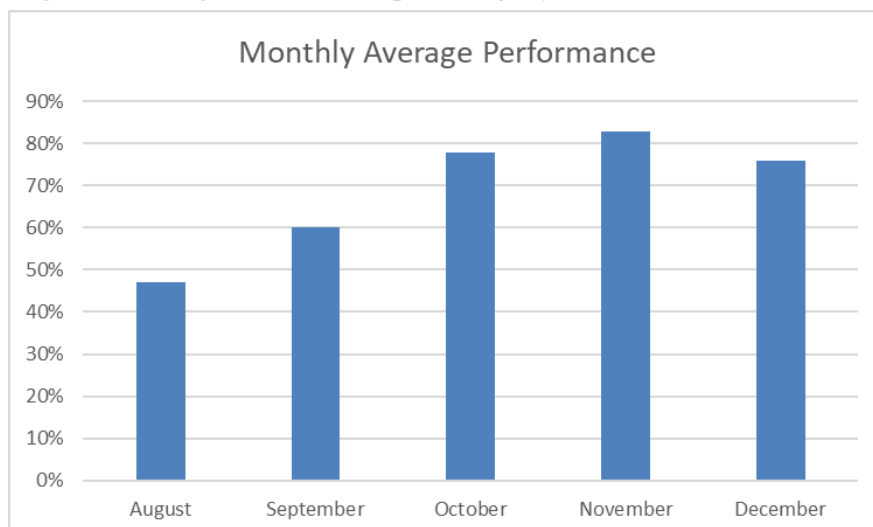


Figure 3. Performance of three key areas by month

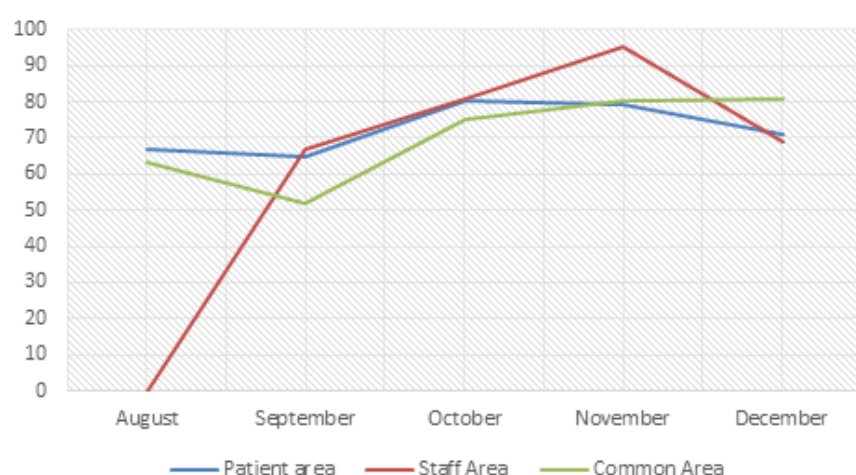


Table 2. Effect of morning first visit on the other visits on same day

no	Morning visit score	Same day to other ward	Ranksum test
1	32	47	0.016
2	67	89	
3	33	71	
4	91	94	
5	81	91	
6	86	91	
7	71	95	
8	62	91	
9	62	86	
10	58	76	

Table 3. Month-wise progress of cleanliness of the audit score

Month	Number of audits done	Performance Average	P value for trend
August	01	47 %	<0.01
September	05	60 %	
October	11	78 %	
November	04	83 %	
December	07	76%	

It was also observed that follow up audits within 2 weeks were higher scoring compared to visits beyond 3 weeks. It is observed that as audit gap increases, there is a tendency for poorer scores due to a sense of complacency arising after a certain period of time. Initial audit scores of surprise visual inspections were poor depicting that objective assessment correlates well with low patient satisfactions found in earlier studies. There was no system of regular audit which led to an environment of non-accountability and hence low audit scores to begin with. It took eight inspections before cleanliness reached a respectable score of 71% in the ninth audit which demonstrates that response takes a certain time and persistence to take momentum and become sustained. The response rises steadily to reach a plateau which persists.

Worst cleaned elements (scores) included difficult to clean elements like damp dusting of fans and exhaust fans, cleaning of window grills in corridors and windows or elements of high use like doors, windows, including glasses, damp dusting of the window glass, dry and wet mop of side walls up to tile area. But the increase was seen in these areas also after continuous audit. The elements which were overused like toilets had poor scores due to disproportionate number of patient beds in relation to utility facilities. On the contrary, number of toilets has reduced over a period of time due to conversion of these into storage areas. These reduction in toilets have led to increase in the use of remaining toilets and hence difficult for the staff to clean them. Dip in scores during the month of December was attributed to the water which was very cold and chilled during December (also during January) due to which staff was reluctant to use it.

Although there were monitoring and feedback provisions in the tender, this did not bear results as these could have been just documentary activity of filling reports and no actual visits took place. Three pronged new approach of team activity, element of surprise and objective assessment and monitoring done regularly and frequently leads to improvements that are sustained.

## 5. CONCLUSION

Monitoring through objective assessment appears to be a good monitoring tool for comparison of quality of cleanliness. Unless objective assessments are done, cleanliness is poor as evident from lower scores during initial surprise audits; there should be a monitoring mechanism in place for the



same. The audit frequency should be two weeks to be able to sustain the cleanliness. Monitoring, feedback and counselling helps to improve cleanliness significantly but for sustainable response, persistent or continuous inspections at regular intervals are needed. Providing warm water for cleanliness through solar heater in cold weather may be an effective intervention to improve the cleanliness.

## 6. Competing interests/conflict of interests

There is no competing interests/conflict of interests.

**Table 4. Month wise effect of inspection on cleanliness of the three critical area**

Month	Patient area	P value for trend	Staff Area	P value for trend	Common Area	P value for trend
August	67	0.05	0	<0.01	63	<0.01
September	65		67			
October	80		81			
November	79		95			
December	71		69			
			81			

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