

Research Article

Evaluation of implementation of “5S Campaign” in urban health center run by municipal corporation, Gujarat, India

Vijay P. Pandya^{1*}, Umed V. Patel², Bhavesh R. Kanabar², Isha V. Joshi¹, Amiruddin M. Kadri²

¹Health Department, Municipal Corporation, Rajkot, Gujarat, India

²Community Medicine Department, P. D. U. Govt. Medical College, Rajkot, Gujarat, India

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*Correspondence:

Dr. Vijay P. Pandya,

E-mail: drpandya2902@gmail.com

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ABSTRACT

Background: Despite significant progress in improvement of Government health care delivery system over past decade, community is reluctant to accept it because of substandard level of quality. “5S” is one of the strategies used to improve the physical quality and work efficiency of organization. 5S stands for five Japanese words which can be translated in English as Sort, Set in order, Shine, Standardize, and Sustain. Rajkot Municipal Corporation has adopted 5S strategy within its health centers with the aim to improve image of public health care facility among community and thereby to increase coverage of health services. This study was conducted to assess 5S implementation status at all Urban Health Centers under health department of Rajkot Municipal Corporation, Gujarat, India.

Methods: “5S” was implemented by the corporation in campaign mode in 18 Urban Health Centers in July 2014. Campaign included training, baseline assessment, and observing 5S week. A cross sectional study was carried out by personal observation and interview to assess the implementation of 5S campaign. Standard audit check list recommended by the State Quality Assurance Cell, Gujarat was used to evaluate.

Results: Overall; all five components of 5S showed significant improvement ($p < 0.001$) with highest improvement in Sorting and Setting in order. Significant improvement in utilization of Out Patient, laboratory services, immunization, family planning services etc were observed in comparison to previous year’s corresponding period.

Conclusions: Significant improvement in utilization in major health care services was noted in the study after implementation of 5S. ‘5S’ practice can be sustained with sincere and continuous efforts.

Keywords: Quality, Public healthcare services, Urban health centers, 5S

INTRODUCTION

India has made significant progress in improvement of health care delivery system over past decade. The Government of India’s various initiatives in terms of missions, schemes and programmes have largely contributed to this. In present modern era, the continual improvement of service quality in health care sector is of prime consideration to ensure patients’ satisfaction. The health care sector is a fastest and largest growing sector in India.¹ In recent past Government of India is also giving much emphasis on improvement of quality of Government healthcare services. Many times patients

choose private health care sector because of substandard level quality of Government health care services.² Government of India has initiated various initiatives to improve physical quality of health care system by introducing various accreditations and standards e.g. National Accreditation Board for Hospitals and Healthcare providers (NABH)³, Indian Public Health Standards, 5S etc. Three types of qualities can be addressed in reference to Government health care facility: 1). Medical care: includes availability of well functioning diagnostic and treatment facility, 2). Physical appearance: includes availability of good quality infrastructure, 3).

Human behavior: includes interpersonal behavior of staff with patients and relatives.

The Concept of 5S evolved from a manufacturing enterprise in Japan and was later on applied to business sector in western countries in 1980. 5S stands for five Japanese words Seiri, Seiton, Seisou, Seiketsu, and Shitsuke which can be translated in English as Sort, Set in order, Shine, Standardize, and Sustain. All these words represent following set of practices; 1. Sort: To sort and systematically discard items those are not needed in the workplace 2. Set in Order: To arrange necessary items in a neat and systematic manner so that they can be easily retrieved for use and to returned after use. 3. Shine: To clean and inspect the workplace thoroughly so that there is no dirt on the floor, machines and equipments etc. 4. Standardize: To maintain a high standard of workplace organisation by keeping everything clean and orderly at all times. 5. Sustain: To train people to practice the 5S system continuously so that it becomes habitual and ingrained in the culture of the organisation.

Lacks of cleanliness and long waiting time are amongst the prime reasons to avoid Government healthcare facility. 5S is a lean method of workplace organization. Implementation of 5S in health care sector can ensure cleaner and organised workplace and so that patient friendly environment is created. Along with improving the physical quality of the work place; it also increases the work efficiency. 5S encourages streamlined inventories, clutter free workspaces, and processes to maintain housekeeping standards. This strategy is being used in healthcare to reduce inventory, create space, and reduce travel and search times. Each stage of a 5S project has an impact on safety, from sort where broken or expired items are removed, to sustain where ongoing cleaning, maintenance, and quality checks are routinely conducted.⁵ It also reduces lead time and change over time by streamlining the operations. Ultimately patients' complains are reduced and coverage of health services of Government health care facilities are increased. Government of Gujarat had issued a circular regarding implementation of 5S in all Government health care facilities. Health department of Rajkot Municipal Corporation implemented 5S practice in campaign mode in all 18 Urban Health Centres (UHC) of the city from July 2014.

It is necessary to know what the implementation status is and changes happened at the centre after implementation of the 5S in the public health centre. The current study was planned with the same aim, with objectives to know implementation status of all components of "5S" in all Urban Health Centres, to know the change in different 5S components after campaign and to know effects of 5S on service utilization.

METHODS

Municipal Corporation has implemented 5S approach in mission mode in all the 18 UHCs of the Rajkot City in month of July 2014. Under the title "5S Campaign", the 5s practice, was modulated and implemented in healthcare institutions in mission mode. As a part of campaign; baseline assessment, modules and IEC material preparation and training of all staffs with celebration of a week for 5S implementation were carried out.

Day to day planning was done and intensive efforts were carried out for sorting, setting in order, shining and standardizing at all the centres during this campaign. Actual process of 5S implementation consisted of proper arrangement of all instruments, equipments, furniture, materials, record-registers, IEC materials etc. along with disposal of old and unused materials. It also included accurate labelling at all important places and good housekeeping and cleanliness all over the workplaces. Strengthening of Bio Medical Waste Management and proper maintenance of laboratory and pharmacy were also ensured.

5S Audit tool

A cross sectional, observational type study was carried out to assess the 18 UHCs by use of a structured audit checklist recommended by State Quality Assurance Cell, Gujarat, India. Same audit checklist was used for both baseline assessment and external evaluation. Audit check list had questionnaire for all components of 5S viz. Five questions for Sort; Four questions for Set in order; Twenty Four questions for Shine; Seven questions for Standardize and Five questions for Sustain. Total questions were 45. Each sub component (question) was assessed with personal observation and scored from 1 to 5. The scoring is in descending order viz. 5 for excellent, 4 for good, 3 for average, 2 for poor and 1 for very poor performance.

Indicators regarding performance of various health care delivery services were pre-decided i.e. Out Patient Department, laboratory tests, Family planning service, beneficiaries of schemes, etc. for measuring the impact of the '5 S Campaign'. Baseline internal assessment was carried out by Medical officers of all UHCs using the pre-formed 5S audit checklist and score was noted in the month of July 2014. Actions were taken for ensuring necessary improvement in 5S implementation as per feedback of baseline assessment.

External evaluation was carried out by Community Medicine Department, P. D. U. Govt Medical College, Rajkot, during November 2014, i.e. after about 3 months of 5S implementation using same audit check list.

During visit of UHCs, whole campus, OPD room, indoor room, laboratory, pharmacy, operation theatre (if

available), place for biomedical waste storage, store, overhead water tank, underground water tank etc. were directly observed. Cleanliness status, separation of useful and non useful items, presence of non useful items in working area, display of signage board, labelling, arrangement of files, instruments etc. in cupboards; medicines in pharmacy, autoclaving, checklist and monitoring sheet of cleanliness were assessed while inspecting all areas in health centres.

RESULTS

During our visits to health centres, it was noticed that almost at all the centres sorting of unnecessary items was done and required items were arranged in a visually organised manner so that they could be easily retrieved at the time of use and returned back after use. Cleanliness status of all the Urban Health centres was satisfactory. Almost at all places most of the files, cupboards, furniture, etc. were labelled. Signage board were displayed at all the rooms. However maintenance of bio medical waste system and autoclave register had further scope of improvement. Cleanliness and its monitoring responsibilities were allotted at almost all the UHC but it was required to be documented. Enough logistics were available at all the UHC for cleanliness. Cleanliness monitoring sheet needed to be displayed at various areas like toilet, chambers, etc. with daily check it by supervisor.

Maximum score for each component was 5. Only one component was below 3 score before start of the campaign but on evaluation all components scored more than 3. Table 1 shows significant increase ($p < 0.001$) in score of all components of 5S after its implementation. On evaluation 'Sorting' scored highest (3.80) followed by Set in order (3.79) and Standardize (3.71). Points in improvement were ranging from 0.19 to 0.89 with lowest improvement in 'shine' and highest in the component 'Sustain' (Table 1).

Table 1: Comparison of average score of various 'S' of all Urban Health Centers before and after "5s Campaign".

5 S component	Average Score		Average score increased in three months	P value
	July 2014	November 2014		
S1 -Sort	3.21	3.80	0.59	<0.001
S2-Set in Order	3.06	3.79	0.73	<0.001
S3-Shine	3.41	3.60	0.19	<0.001
S4-Standardize	3.08	3.71	0.63	<0.001
S5-Sustain	2.75	3.64	0.89	<0.001

It is evident from the Table 2 and Table 3 that there is significant improvement in each component of 5S in all the Urban Health Centres ($p < 0.001$). While all the centres scored below three 'average score' before the campaign, but after campaign 4 centres crossed the score of 4 and reached towards excellent. Except one centre all other centres scored more than 3 scores. Nana Mauva UHC scored highest score (4.61) as was leading in all the components of 5S after its implementation with above "Good" level of score in all the component and even excellent score in 'Setting In Order'. Ambedkar nagar UHC and Bhagvatipara UHC followed the Nana Mauva UHC with score of 4.38. One UHC (IMA) remained below 3 even after the campaign with marginal improvement of 0.23 points (Table 2 and 3, Figure 1).

Table 4 shows improvement in selected indicators of health care delivery services by Urban Health centres after implementation of 5S.

DISCUSSION

Despite its origin in manufacturing, 5S projects have been documented in a variety of settings in healthcare through a project administered by the National Health Service (UK) including wards of acute patient facilities, finance, information technology, laboratories, and community offices.⁶ This initiative presents a systematic way of making improvements in various hospital settings, including wards, operation theatres and community services, mainly through the application of the 5S approach. In present study the result of 5S campaign was evident with improvement in the average score for each "S" and statistically significant improvement in the all 18 UHC. The fifth "S-Sustain" is the most challenging part of a 5S initiative. Maintaining the first four Ss, once the excitement of the initial 5S event has concluded requires conscious effort on the part of all employees, not just the ones directly involved in the initial event.⁷ The highest improvement in "Sustain" can be considered a good achievement as it indicates that 5S campaign has moved to the right direction of institutionalization.

Our study showed increase in utilization of major health care services after implementation of 5S at Urban Health Centres of Rajkot City in the absence of any other major change in the health care delivery system. The increase in utilization indirectly indicates that client have started rating the health care service higher than past. In another qualitative study of staff perception about implementation of 5S management method for lean healthcare at a health centre in Senegal showed that participants perceived changes in their own and others' attitude and behaviour after the 5S program implementation. Participant also noticed change in the quality of health services particularly in patient centeredness and safety domain. Almost all the participants mentioned that the 5S program facilitated the identification of items, and hence reduced time spent searching for an item.⁴

Table 2: Comparison of average score of different S components in different Urban Health Centers before and after “5s Campaign” (n=18).

Name of UHC	S1 -Sort		S2-Set in Order		S3-Shine		S4-Standardize		S5-Sustain	
	July 2014	Nov. 2014	July 2014	Nov. 2014	July 2014	Nov. 2014	July 2014	Nov. 2014	July 2014	Nov. 2014
Nana Mauva	3.40	4.80	3.75	5.00	3.57	4.09	4.00	4.57	4.00	4.60
Ambedakar Nagar	3.80	4.20	3.25	4.25	3.87	4.21	3.71	4.85	3.80	4.40
Bhagvatipara	3.67	4.33	3.00	4.50	3.85	4.20	3.71	4.28	4.00	4.60
Ranchod Nagar	3.40	4.40	3.50	4.00	3.50	3.77	3.57	4.85	2.80	3.40
Pranami Chowk	4.00	4.40	3.75	4.75	3.50	3.63	2.57	3.57	2.00	3.40
Sadar	2.40	2.80	3.50	4.25	4.05	4.10	3.29	3.71	3.50	4.75
AKhil Hind Mahila Parishad (AHMP)	3.60	4.00	3.50	4.25	3.61	3.73	3.57	4.00	3.00	3.60
Rampark	3.80	4.20	3.50	4.25	3.62	3.61	3.00	3.66	2.80	3.80
Junction Plot	2.60	3.00	3.25	3.25	4.00	4.04	3.71	4.14	2.80	4.50
Morbi Road	3.00	3.60	2.75	3.75	3.69	3.75	2.57	3.71	1.80	3.60
Mavdi	2.80	4.20	2.50	4.00	2.54	3.31	2.29	3.14	2.20	3.40
Vijay Plot	3.20	3.80	2.50	3.00	3.57	3.61	3.57	4.28	2.60	3.20
Ramnathpara	4.00	4.40	3.00	3.75	3.42	3.45	2.14	2.71	2.40	3.20
Nandavvan	3.60	4.20	2.50	3.00	3.52	3.57	2.71	3.14	2.80	3.40
Hudko	2.80	3.20	3.25	3.25	3.14	3.14	3.29	3.57	2.80	3.20
Champak Vora	2.60	2.80	2.75	3.50	2.65	2.70	3.17	3.66	2.40	3.20
Narayan Nagar	3.20	3.60	3.00	3.75	3.23	3.59	1.86	2.28	1.60	2.40
Indian Medical Association (IMA)	2.00	2.40	1.75	1.75	2.10	2.28	2.71	2.71	2.20	2.80

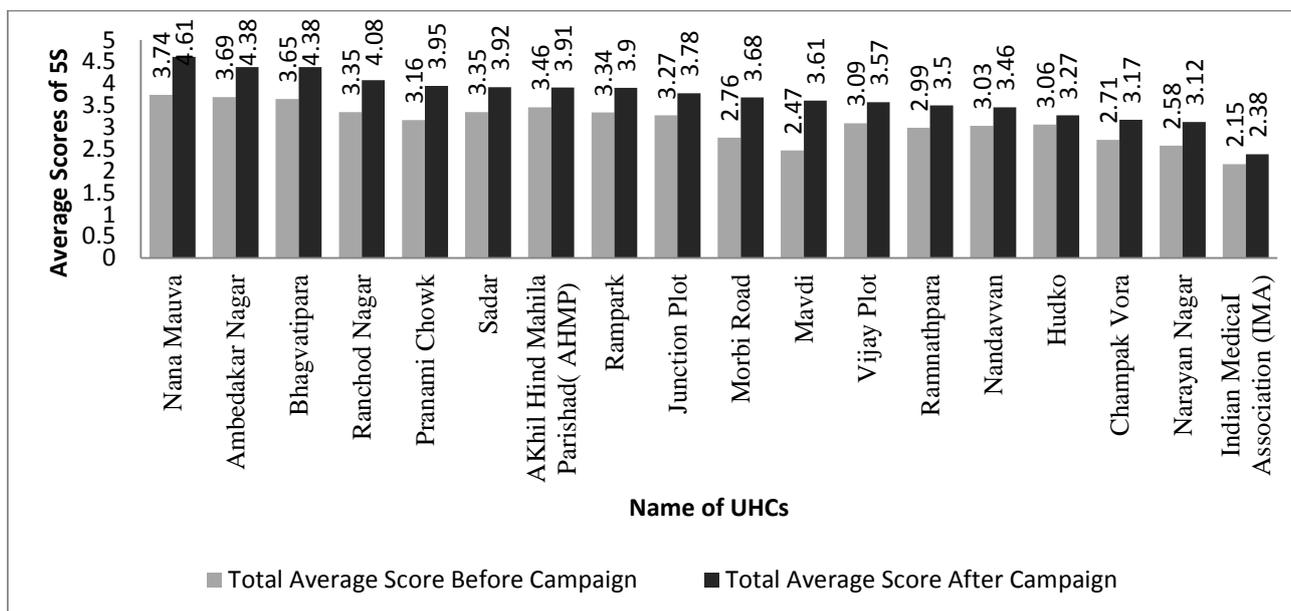


Figure 1: Comparison of Total average score of 5S in different Urban Health Centres before and after “5s Campaign”.

In another study at the Bellevue Surgery Centre; after 5S implementation more than 90% of patients and families gave a 9 or 10 rating for overall care.⁸ ThedaCare, a Wisconsin-based integrated health system, reduced inpatient total cost of care by 25% while improving patient satisfaction to nearly 100% of patients; rating their care 5 out of 5 following 5S implementation.^{8,9}

Findings of above mentioned studies are in line with our findings.

Limitation of the study

Scope of subjectivity in scoring can be there. Baseline and last assessment were carried out by different

investigators of different institutes. The utilization data is based on the records from UHC.

Table 3: Comparison of total average score of 5S in different Urban Health Centers before and after “5s Campaign” (n=18).

Name of UHC	Average Score		Point increase
	July 2014	November 2014	
Nana Mauva	3.74	4.61	0.87
Ambedakar Nagar	3.69	4.38	0.69
Bhagvatipara	3.65	4.38	0.73
Ranchod Nagar	3.35	4.08	0.73
Pranami Chowk	3.16	3.95	0.79
Sadar	3.35	3.92	0.57
AKhil Hind Mahila Parishad(AHMP)	3.46	3.91	0.45
Rampark	3.34	3.90	0.56
Junction Plot	3.27	3.78	0.51
Morbi Road	2.76	3.68	0.92
Mavdi	2.47	3.61	1.14
Vijay Plot	3.09	3.57	0.48
Ramnathpara	2.99	3.50	0.51
Nandavvan	3.03	3.46	0.43
Hudko	3.06	3.27	0.21
Champak Vora	2.71	3.17	0.46
Narayan Nagar	2.58	3.12	0.54
Indian Medical Association (IMA)	2.15	2.38	0.23
<i>P Value < 0.001, Z value= -3.724</i>			

CONCLUSION

Significant improvement in utilization in major health care services was noted in the study after implementation of 5S. Almost all the Urban Health Centres showed improvement in score of all components of 5S as compared to baseline score and this ‘5S’ practice can be sustained with sincere and continuous efforts.

Recommendation

It is recommended that all Health care delivery system should adopt 5S strategies to improve the quality and coverage of health services.

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Ethical approval: Not required

Table 4: Impact of 5S implementation on health care delivery service provided by Urban Health Centres.

Indicators	2013-14 (Aug. to Feb.)	2014 -15 (Aug. to Feb.)	Percentage increase
Number of patients consulted in Out Patient Department	106112	249173	134.8%
Number of Laboratory Tests performed	48953	76230	55.7%
Number of IUCD inserted	5429	6218	14.5%
Number of Sterilisation operations performed	1001	1352	35.1%
Number of beneficiaries of Janni Suraksha Yojana	723	1544	113.6%
Number of beneficiaries of Kasturba Poshan Sahay Yojana	2334	3185	36.5%
Number of beneficiaries of Chiranjeevi Yojana	398	1296	225.6%
Number of beneficiaries of Bal Sakha Yojana	380	1041	173.9%

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