

Factors Contributing To The Sustainability Of 5S Programmes In Government Hospitals In Regional Director Of Health Services Area Kurunegala

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Abstract: Introduction: 5S is the stepping stone for many quality improvement concepts and its roots date back to 16th century. When successfully implemented, 5S gives many benefits to the organization as well as its stakeholders. Though 5S itself has a tool to sustain, most of the organizations find it difficult to sustain the 5S practice over the time. Therefore the objective of this study was to find out the factors contributing to sustainability of 5S programmes in Government Hospitals in RDHS area Kurunegala. **Methodology:** This study was a descriptive cross sectional study with two components. First component was to identify the 5S sustaining hospitals from not sustaining hospitals by validated evaluation sheet. Second component was to determine the factors contributing to sustainability of 5S programmes in selected study setting. Self-administrated questionnaire was used for this purpose. Total study population was 543 employees of all the categories of hospital staff. Calculated sample size was 422 and 375 were responded to the questionnaire giving response rate of 88.9%. **Results:** The study revealed that the implemented 5S programmes were sustaining in eight hospitals out of ten i.e. sustaining rate was 80%. When it considered the degree of sustainability, 50% of the selected hospitals reported more than 70% sustainability. This was considered as favourable trend in government health sector in healthcare quality point of view. Ten factors were studied as contributing factors for the 5S sustainability. Socio- demographic factors were also considered. Those ten factors were top management commitment, leadership of the organization, commitment of middle & frontline managers, commitment & satisfaction of employees, training & changing attitude of employees, motivation of employees, organizational culture, group cohesiveness, community participation and customer satisfaction. Study revealed that organizational leadership, customer satisfaction, community participation and organizational culture were the major contributing factors for sustainability of 5S programmes in government hospitals in RDHS area Kurunegala. **Conclusion:** Researcher concluded that **organizational leadership, customer satisfaction, community participation and organizational culture** are the major contributing factors for 5S sustainability in Divisional Hospitals in RDHS area Kurunegala, further it could be generalized to the all Divisional Hospitals in the country

Introduction

Sri Lanka provides free health care to all the citizens irrespective of their status, income or geographic location, and achieved remarkable health outcomes, particularly relative to neighbouring countries with a similar income range. Though we have better health outcomes, productivity and service quality of Sri Lankan public health sector has been not very attractive. So there has been high felt need to policy makers to improve the productivity and service quality of public health sector. 5S has been identified as the entry point to improve the service quality in health care provision in Sri Lankan health sector.¹ 5S is a Japanese concept used globally to improve productivity and quality. It was introduced by Takashi Oshada in the early 1980s. 5S is the acronym for 5 Japanese words which stand for Seiri, Seiton, Seiso, seiketsu and shitsuke.² 5S is the stepping stone for many other quality techniques and process improvements such as Kaizen, Just-in-time (JIT), Six Sigma and Total Quality Management (TQM). Seiri is the systematic removing of all items from the work place that are not needed for processes and activities. Seiton is the arrangement of needed items so that they are easy to use and label them so that providers can find them easily and put them away when they are done.

It can be simply defined as that all equipment should have dedicated places and that equipments should be kept in their places. Seiton is important in health care facility because it eliminates many types of wasteful clinical and administrative activities. Seiso is the third component of 5S concept that emphasizes the systematic and meaningful removal of dirt, trash, waste and other contaminants from the work place. As such Seiso means that everything is kept wiped swept and clean at all times. One of the obvious purposes of the Seiso is to turn the work place in to a clean, bright, safe and sanitary place where everyone will enjoy working. Seiketsu means creating a consistent way of carrying out tasks and procedures i.e. standardization. This is the method used to maintain first three steps in 5S concept. It can be defined as the outcome of properly maintained Seiri, Seiton and Seiso. In other words, Seiketsu integrates those three steps into a unified whole. The basic purpose of Seiketsu is to prevent setbacks in the first three steps, to make implementing them a daily habit and to make sure that all three steps are maintained in their fully implemented state. Shitsuke means to make a habit of properly maintaining correct 5S procedures forever. The implementation of the Shitsuke is different from other 4S in the sense that results are not visible and cannot be measured. Commitment to it exists in people's heart and mind, and only their behaviour shows its presence. Therefore it cannot be implemented like a technique but conditions can be created to encourage the implementation of Shitsuke.³ Most Japanese company claimed that they have improved their productivity, quality and thinking pattern of employees with the implementation of 5S. Although it gives vast range of benefits to the organization as well as to the employees, it can be implemented at very low cost. The National productivity policy for Sri Lanka was formulated in 2002 to promote the productivity and quality in organizational level. Readiness to improve productivity in the work place implies a new work culture which is about new ways of thinking and doing. The National productivity policy envisages that such a strong work

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culture is a *sine qua non* for continuous productivity and quality improvement.⁴ 5S is the gateway of the most of quality and productivity improvement programmes. The idea of the 5S concept was introduced to Sri Lanka in 1990 by Dr. Taiki Akimoto, a renowned practitioner of 5S in Japanese industry.⁵ Since then several public and private organizations in Sri Lanka have implemented 5S successfully and improved their productivity and service quality. Many health care institutions in Sri Lanka have improved their productivity and service quality by implementing the Japanese 5S concept. Castle Street Hospital for Women was the first Healthcare institution which implemented the 5S concept successfully in year 2000. This was the best example in Sri Lanka that the ability of successfully implemented 5S programmes to enhance the service quality of a hospital.⁶ Most of the curative health care institutions in North Western Province in Kurunegala and Puttalam RDHS areas have successfully implemented the Japanese 5S concept. Productivity and quality improvement programmes based on Japanese 5S concept will give better outcome with limited resources in health sector.⁷

Objective

To determine the factors contributing to the sustainability of 5S programmes in government hospitals in Regional Director of Health Services area, Kurunegala.

Methodology

This was a hospital based Descriptive Cross Sectional Study to assess the factors contributing to the sustainability of 5S programmes in selected government hospitals in Kurunegala Regional Director of Health Services area. There are 46 Hospitals in Kurunegala Regional Director of Health Services area including four Base Hospitals. Out of this, only Divisional Hospitals in the Regional Director of Health Services area Kurunegala were selected to the study to minimize the selection bias. From 42 Divisional Hospitals ten Hospitals have been selected using stratified random sampling techniques for the study. All selected Divisional Hospitals have implemented 5S programmes since 2007. Selected Hospitals for the study were Hiripitiya, Polpithigama, Rideegama, Bingiriya, Katupotha, Narammala, Indulgodakanda, Karambe, Kobeigane and Muwanhela. The data was collected over the period of one month in selected hospitals, commencing from 1st of August 2013 to 1st September 2013. Ethical clearance was obtained from the Ethics Review Committee, Faculty of Medicine-University of Colombo. The study was completed within the period of five months. Study population of this study consisted of all the employees of selected ten Hospitals during the study period. Total number of employees in the selected hospital was 543. Sample size for the study was calculated according to the standard formula.⁸ And it was 422 while 375 were responded. Population proportion technique was applied to the study population to decide the relevant sample from each hospital. Then study population of each hospital was divided in to strata according to the type of employee category. Number of participant chosen in each stratum was proportional to the size of the stratum. This is called proportional allocation.⁹ Data taken from the payroll was used to make the sampling frame. Separate sampling frames were made for each category of the employees. Then using a table of random numbers, required numbers of employees from each category were selected. This procedure has reduced the selection bias in the study.

Study Variables:

Following list was considered as study variables after extensive literature review and Focus Group Discussion.

1. Sustainability of 5S programme
2. Top management commitment
3. Organizational leadership
4. Middle and frontline manager's commitment
5. Employee commitment and satisfaction
6. Training of employees and changing attitude
7. Motivation and Development of employees
8. Group cohesiveness
9. Organizational culture
10. Community participation
11. Customer satisfaction and Involvement
12. Socio-demographic variables

Study instruments:

This study has two study instruments.

1. Direct observation for evaluation of 5S sustainability
2. Self administrated questionnaire

Japan Sri Lanka Technical and Cultural Association (JASTECA) have developed a 5S evaluation sheet for their 5S award competition. This is called Taiki Akimoto's 5S evaluation sheet which was used for the evaluation of 5S sustainability.⁵ Taiki Akimoto's 5S evaluation sheet is well structured and gives complete details on every aspect of 5S evaluation and it gives total 250 marks. Organizations which have scored more than mean-1.96SE were considered as having sustained 5S programme for this study. The self administrated questionnaire consisted of two parts i.e. ten questions on socio-demographic characteristics and ten questions on selected independent study variables. Each question comprised five components related to the selected indicators. The responses to these questions were assessed in Six point Likert Scale.¹⁰ Ratings of six point Likert scale is strongly disagree, disagree, slightly disagree, slightly agree, agree and strongly agree.

Results

Level of sustainability of 5S programmes in each hospital was evaluated by using Taiki Akimoto Evaluation sheet which gives points out of 250 according to the degree of the sustainability. Table 1 shows the results of evaluation.

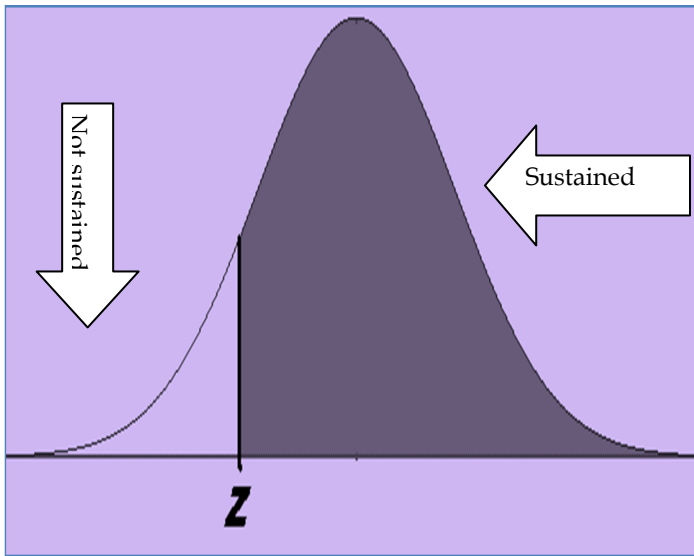
Table 1: Level of sustainability of 5S programmes

Hospital	Sustainability	Percentage of sustainability %
DH Hiripitiya	162	64.8
DH Polpithigama	192	76.8
DH Rideegama	185	74.0
DH Bingiriya	180	72.0
DH Katupotha	182	72.8
DH Narammala	103	41.2
DH Indulgodakanda	148	59.2
DH Karambe	97	38.8
DH Kobeigane	196	78.4
DH Muwanhela	137	54.8
Mean		158.2
Standard Deviation		36.043
Standard Error of Mean		11.398

The highest degree of sustainability of 5S programme was reported in DH Kobeigane (78.4%) while the lowest degree was reported in DH Karambe (38.8%). Cut off point for sustainability was determined statistically as follows.
 Cut off point for sustainability = Mean- 1.96 SE
 = 158.20- 1.96*11.398
 = **135.86**

Therefore DH Narammala and DH Karambe were categorized as not sustain group and other eight hospitals were categorized as sustain group of hospitals. Figure 1 further elaborates the determination of cut off point for sustainability.

Figure 1: Cut off point for sustainability of 5S programmes



Z is equal to Mean – 1.96SE. Hospitals that scored more than Mean- 1.96SE points from the Taiki Akimoto evaluation sheet were considered as sustained. Therefore there were two groups of hospitals in this study as sustained and not sustained. When it considered socio-demographic variables, there was a statistically significant negative correlation between sustainability of 5S and service experience of the employees in their current hospital at 0.05 level (Spearman's rho Correlation Coefficient was -0.110 and p value was 0.034). There were no significant correlation between other socio-demographic variables and 5S sustainability. Correlation between 5S sustainability and ten independent variables were calculated and table 2 shows the results.

Table 2: Correlation between 5S sustainability and ten independent variables

Independent variable	Pearson Correlation Coefficient	Significance (2-tailed)
N= 10		
Commitment of Top management	0.785	0.007**
Leadership of Hospital	0.747	0.013*
Commitment of Middle & Frontline managers	0.769	0.009**
Commitment & Satisfaction of employees	0.652	0.041*
Training of Employees	0.831	0.003**
Motivation & Development	0.723	0.018*
<i>Group Cohesiveness</i>	0.492	0.149
<i>Organizational Culture</i>	0.704	0.023*
Community participation	0.905	0.000**
Customer satisfaction	0.708	0.022*

** significant at .01 level * significant at .05 level

There were statistically strong significant correlations between 5S sustainability and commitment of top management, commitment of middle & frontline managers, training of employees and community participation found at 0.01 level in this study. Correlation between 5S sustainability and leadership of the hospital, employee satisfaction & commitment, motivation & development, organizational culture and customer satisfaction were significant at 0.05 level. There was no significant correlation found between 5S sustainability and group cohesiveness in this study. ANOVA Analysis was done to compare the independent variables between two groups of hospitals and table 3 shows the results.

Table 3: ANOVA Analysis of independent variables between two groups of hospitals

Factor value	Sustain	Not Sustain	Group.	Group	F
Leadership	5.08	3.00		265.617	0.000
Customer satisfaction	5.04	3.42		295.395	0.000
Community participation	4.81	3.49		159.020	0.000
Organizational culture	4.76	3.30		185.275	0.000
Mid. & FL mgt commitment	4.44	4.05		27.334	0.000
Employee commitment	4.44	4.24		8.319	0.004
PD & RD commitment	4.42	3.31		88.428	0.000
Training of employees	4.30	3.87		32.420	0.000
Group cohesiveness	4.05	3.49		35.618	0.000
Motivation		3.50	2.51	68.061	0.000

Leadership of the organization was having the highest mean value in the sustain group of hospitals while Motivation was having the lowest value. In not sustain group leadership was having low score and motivation was having the lowest score. There were strongly statistically significant differences of means of all ten variables found between two groups of hospitals.

Discussion

Nowadays, the adoption of 5S practice as the gateway to quality improvement is well accepted by many organizations worldwide.¹¹ Researchers agreed that 5S is very powerful tool, feasible to implement and incurred less investment in improving the organizational performances on the aspects of economic opportunities and environmental sustainability that include the benefits of quality, productivity, safety, cost, workplace environment and waste reduction.¹² The benefits that could be gained from 5S implementation are in accordance to 3Ps (people, planet and profit), a well-known marketing principle which having strong linkage with sustainability.¹³ In short, the practice of 5S would generate benefits for people (e.g., safety, health, and discipline), planet (e.g., waste, pollution, and energy), and profit (e.g., productivity, quality, and operational cost). All aspects of 3Ps need to be fulfilled in order to become sustainable organizations. Therefore sustainability of the implemented 5S practice would enhance the sustainability of the organization. Further it improves the image of the organization in every aspect and dominates the market share among same category of organizations. In this Descriptive Cross Sectional study, Pearson correlation coefficient was selected as the statistical test to calculate the correlation between 5S sustainability and independent variables of the study. According to table 2, there were statistically significant strong correlations between 5S sustainability and nine independent variables except group cohesiveness. Therefore those nine factors could be considered as contributing factors for sustainability of the 5S programmes in government hospitals in RDHS area Kurunegala. These findings were compatible with a previous study on factors contributing to sustainability of 5S in Sri Lankan organizations.¹⁴ In their study, leadership of the organization, commitment of top managers and employee commitment were significantly correlated with 5S sustainability at 0.01 level. ANOVA Analysis was done to compare final scores of independent variables between two groups of hospitals as shown in table 3. There were strongly statistically significant differences of means of all ten variables found between two groups of hospitals. Therefore researcher has concluded that all ten variables could be considered as contributing factors for 5S sustainability in statistical point of view. When it considered the sustain group, leadership had the highest mean value (5.08); hence leadership of the hospital is declared as the most important factor for the sustainability of 5S programme in this study setting. In not sustaining group, leadership scored very low mean value (3.00). It further confirmed the previous decision on leadership. These findings were compatible with a previous study of factors contributing to sustainability of 5S in Sri Lankan organization.¹⁴ Customer satisfaction has scored next higher mean value (5.04) in sustain group while not sustain group has scored much lower value (3.42). Therefore it is evident that customer satisfaction also plays a major role in 5S sustainability in government hospitals in RDHS area Kurunegala. Community participation and organizational culture were also in the top of the list in the sustaining group. Motivation and development of employees were in the bottom of the list in both groups. This could be explained by Maslow's Hierarchy of need theory.¹⁵ Therefore health authorities should further study this factor for them to implement sustainable 5S programmes in hospital setting. Though there were statistically significant differences in middle and frontline manager commitment and employee commitment

between two groups, there were no major differences in real mean values, i.e. mean value for middle and frontline manager commitment were 4.44 & 4.05 in two groups respectively and mean values for employee commitment were 4.44 & 4.24 respectively. Mean values for other variables have visible as well as statistically significant differences between two groups. Therefore organizational leadership, customer satisfaction, community participation and organizational culture were declared as major factors for sustainability for 5S in this study.

Conclusion

This study reveals better understanding of factors contributing to the sustainability of 5S programmes in Governmental Hospitals in RDHS area Kurunegala. Majority of the 5S implemented hospitals in the selected RDHS area are able to sustain their 5S practices. In this study setting, 80% that is 8 out of 10 Hospitals sustain their implemented 5S programmes. 50% of the selected hospitals in RDHS area Kurunegala reported more than 70% sustainability. There were statistically significant positive correlations between 5S sustainability and all independent variables, except the group cohesiveness of employees. Commitment of top management, commitment of middle & frontline managers, training of employees and community participation had the strongest correlations. According to ANOVA analysis of final scores of each independent variable in two groups of hospitals, there were strongly statistically significant differences of means of all ten variables found between two groups of hospitals. Therefore all those factors could be considered as contributing factors for 5S sustainability in statistical point of view. Ultimately this final analysis revealed that organizational leadership, customer satisfaction, community participation and organizational culture are the major contributing factors for 5S sustainability

Recommendation

According to the findings of this study following recommendation could be made by the researcher.

1. 5S is the gateway to many quality improvement concepts; hence outcome of sustainable 5S should improve service quality of the hospitals. Study revealed that there was no significant correlation between sustainability of 5S and service quality improvement of the hospital. Therefore it should be emphasized to the hospital authorities that outcome of 5S programmes should be improved service quality of the hospitals.
2. Leadership of all the government hospitals should be strength in every aspect because organizational leadership is the most important factor for 5S sustainability according to this study.
3. More 5S training programmes and attitude changing programmes should be carried out because study revealed that those two components were significantly correlated with 5S sustainability.
4. Though the hospital authorities have implemented the 5S and quality improvement programmes in their hospital there are no legal bound to do so. Therefore implementation of quality improvement programmes should be legalized in National policy level to improve the service quality of the hospitals.
5. This research was carried out to determine the factors for 5S sustainability and such factors were

determined. It is better to carry out further studies on each factor in detail.

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