

Study on Implementation of Kaizen 5-S Approach in Improving the Quality of Healthcare System, Coimbatore

By

Aakrati Gupta

*Dissertation submitted in partial fulfillment of the requirements of the degree
MBA Hospital and Health Management*

Academic year, 2017-2019



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TO WHOMSOEVER MAY CONCERN

This is to certify that **Dr. AAKRATI GUPTA** student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone internship training at **Sankara Eye Hospital, Coimbatore** from **6th Feb 2019** to **5th May 2019**.

The Candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical.

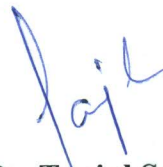
The Internship is in fulfillment of the course requirements.

I wish her all success in all her future endeavors.



Col. Dr. Ashok Kaushik
Dean, Academics and Student Affairs
The IIHMR University, Jaipur

15 May 2019



Dr. Tanjul Saxena
Associate Professor
The IIHMR University, Jaipur



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INTERNSHIP COMPLETION CERTIFICATE

The certificate is awarded to

Dr. AAKRATI GUPTA

In recognition of having successfully completed her
Internship in the department of

Quality and Operations

And has successfully completed her Project on

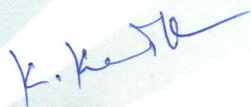
**“Implementation of 5S- KAIZEN Approach in Improving the Quality of Healthcare
System”**

Date: Feb 6th to May 5th, 2019

Organization: Sankara Eye Hospital, Coimbatore

She comes across as a committed, sincere & diligent person who has a
strong drive and zeal for learning.

We wish her all the best for future endeavors.


Kowsik Krishnamoorthy
Manager
(Operations and Partner Relations)




Bharath Balasubramaniam
President
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CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled “A study on implementation of kaizen 5-S approach in improving the quality of healthcare system , Coimbatore” and submitted by **Dr.Aakrati Gupta** Enrollment No. IIHMR-U/01/2017-19/0520 under the supervision of **Dr.Tanjul Saxena** for award of MBA in Hospital and Health of the University carried out during the period from 06/02/2019 to 05/05/2019 embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other institute or other similar institution of higher learning.


Signature

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I, Dr. Aakrati Gupta, a student of MBA-HM- 22 at IIHMR Jaipur, would like to sincerely express my heartfelt gratitude to Mr. Bharat Balasubramanian, President-Operations and Administration, Sankara Eye Hospital, Coimbatore. for giving me incredible opportunities to gain knowledge about management of a healthcare organization.

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ABSTRACT

Quality is an important index in various aspects of life. The 5S-KAIZEN method is widely applied for the improvement of work environments. This systematic approach is fundamentally used to enhance the quality of services in all types of organizations. The present study aimed to assess the application of the 5S-KAIZEN approach in improving the quality of care provision in hospital and evaluate its effects on the job satisfaction of the healthcare providers.

Materials and Methods: This interventional, operational research was conducted at Sankara Eye Hospital. In-depth interviews and kaizen card were performed to obtain the viewpoints of the employees, with the implementation of the 5S-KAIZEN approach in the work environment.

Results: A structured, self-administrated questionnaire was distributed among the 20 employees, of six different departments, 35 ideas were generated out of which 24 ideas were implemented at a compliance rate of 69%.

Conclusion: According to the results, the 5S-KAIZEN approach could improve the standards in the healthcare work environment, support the safe practices leading to high-quality and efficient care services, enhance productivity at a low cost, and increase the satisfaction of the healthcare staff with their professional image and communication with the other personnel

For the degree of freedom 1, value of chi-square is 52.54 and p-value is 0.0039 which is lesser than 0.05, hence we reject the null hypothesis. Indicating there is statistically significant improvement after implementation 5-S Kaizen.

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ABBREVIATIONS

- PDCA: Plan-Do-Check-Adjust
- 5S: Sort, Set, Shine, Standardize, Sustain
- WEI: Working Environment Improvement
- HIS: Health Information Systems
- MRD: Medical record department
- H_0 : Null hypothesis
- H_1 : Alternative hypothesis

Chapter 1:

INTRODUCTION

Quality is an important index in various aspects of life, as well as an essential component of any services and production processes.

Quality is considered to be a strategic tool in all the organizations constantly seeking sustainable quality, increased productivity, and promoted performance .

Quality could be defined as the excellence, fitness for use, and meeting the customers' expectations by providing services in accordance with the latest functional specifications. The Nation's Health defines quality in health care as a direct correlation between the level of improved care services and the desired healthcare outcomes in individuals and populations. Quality of healthcare services is difficult to measure as these services vary depending on the providers, clients, time and place, and professional experience. Therefore, quality control in the healthcare system is challenging since the clients are not able to judge the quality except after receiving the services

5S is a philosophy and a way of organizing and managing the workspace and workflow with the intent to improve efficiency by eliminating waste, improving flow and reducing process unreasonableness and Working Environment Improvement (WEI)

The 5S-KAIZEN method is a structured approach, which is used to achieve and enhance a specific work area so as to ensure the safety and efficiency of the operations with minimum waste at the lowest cost.

This systematic approach is fundamentally used to improve productivity, quality, and safety in all types of organizations . The five words in 5S are a convenient mnemonic device, which are derived from the equivalent Japanese starting with the letter "S", as follows:

S1: Sort (Seiri), which means keeping only the items that are essential to the workplace, while all the other items are stored or discarded depending on their value

S2: Set (Seiton), which refers to arranging the tools, equipment, and supplies, so that they would encourage the workflow

S3: Shine (Seiso), which denotes keeping the workplace clean

S4: Standardize (Seiketsu), which means that the work practices should be performed in a standardized manner

S5: Sustain (Shitsuke), which refers to maintaining and reviewing high standards at the workplace. In this regard, the concept of KAIZEN has been defined as the problem-solving technique, which depends on the plan-do-check-adjust (PDCA) quality cycle and the practices required for constant improvement.





Chapter 2:

REVIEW OF LITERATURE

1. Implementation of Lean-Kaizen in the human resource service process: A case study in a Mexican public service organisation: Emerald Group Publishing Limited (2010)

Over the last decade, some Mexican public organisations have begun to enter into a dynamic in which issues such as service quality, ongoing improvement, and internal and external customer orientation are becoming essential to their day-to-day management. The purpose of this paper is to present a successful example of how Lean-Kaizen is implemented in the human resource service process of a Mexican public service organisation.

2.Kaizen: A Process Improvement Model for the Business of Health Care and Perioperative Nursing Professionals Hassan, A. Tetteh (2011)

Kaizen is a proven management technique that has a practical application for health care in the context of health care reform and the 2010 Institute of Medicine landmark report on the future of nursing. Compounded productivity is the unique benefit of kaizen, and its principles are change, efficiency, performance of key essential steps, and the elimination of waste through small and continuous process improvements. The kaizen model offers specific instruction for perioperative nurses to achieve process improvement in a five-step framework that includes teamwork, personal discipline, improved morale, quality circles, and suggestions for improvement

3. A New Approach to Kaizen Events in Healthcare Delivery Systems: Kaizen Sessions, Norcross (2012)

In this research, a modified Kaizen approach that utilizes a series of two to four-hour Kaizen Sessions is proposed to overcome the managerial problems. In a case study of process improvement Kaizen in a community hospital, a parameter diagram was used to identify each Kaizen session's input-output relations in the planning phase. Kaizen sessions' successes were measured by surveying Kaizen team during the implementation phase. The overall Kaizen Session's effect was assessed by a variety of process metrics. Finally, the structure, process, and outcome of the traditional Kaizen Event and the new Kaizen Session approach were compared.

4.Applying Lean Principles and Kaizen Rapid Improvement Events in Public Health Practice Smith, Gene CSSBB, BS; Poteat-Godwin, Annah BS; Harrison, Lisa Macon MPH; Randolph, Greg D. (2012)

This case study describes a local home health and hospice agency's effort to implement Lean principles and Kaizen methodology as a rapid improvement approach to quality improvement. The agency created a cross-functional team, followed Lean Kaizen methodology, and made significant improvements in scheduling time for home health nurses that resulted in reduced operational costs, improved working conditions, and multiple organizational efficiencies

5. Use of a discrete-event simulation in a Kaizen event: A case study in healthcare: Chantal Baril Nadine Côté (2015)

To improve service delivery, healthcare facilities look toward operations research techniques, discrete event simulation and continuous improvement approaches such as Lean manufacturing. Lean management often includes a Kaizen event to facilitate the acceptance of the project by the employees. The aim is to allow a rapid and successful implementation of the solutions developed during the Kaizen. Our approach has been used to improve patients' trajectory in an outpatient haematology–oncology clinic

6. Kaizen practice in healthcare: a qualitative analysis of hospital employees' suggestions for improvement: Pamela, Henna Hasson (2016)

Kaizen, or continuous improvement, lies at the core of lean. Kaizen is implemented through practices that enable employees to propose ideas for improvement and solve problems. The aim of this study is to describe the types of issues and improvement suggestions that hospital employees feel empowered to address through kaizen practices in order to understand when and how kaizen is used in healthcare.

7. Improving efficiency and safety in external beam radiation therapy treatment delivery using a Kaizen approach (2017)

Modern external beam radiation therapy treatment delivery processes potentially increase the number of tasks to be performed by therapists and thus opportunities for errors, yet the need to treat a large number of patients daily requires a balanced allocation of time per treatment slot. The goal of this work was to streamline the underlying workflow in such time-interval constrained processes to enhance both execution efficiency and active safety surveillance using a Kaizen approach.

8. Examining the impact of health information systems on healthcare service improvement: The case of reducing inpatient-flow delays in a U.S. hospital (2017)''

The impact of Health Information Systems (HIS) on healthcare service improvement is well known; however, there has been a limited amount of research regarding the HIS payoff and how this has influenced the quality of patient care. By focusing on Kaizen,

this study investigates the possibility of reducing patient-flow delays of outpatients using the HIS. By using a six-step Kaizen method, the root causes of patient-flow delays in the outpatient surgery process were first identified, followed by the development of potential solutions and implementation plans.

9.Kaizen practice in healthcare: a qualitative analysis of hospital employees' suggestions for improvement.

Kaizen, or continuous improvement, lies at the core of lean. Kaizen is implemented through practices that enable employees to propose ideas for improvement and solve problems. The aim of this study is to describe the types of issues and improvement suggestions that hospital employees feel empowered to address through kaizen practices in order to understand when and how kaizen is used in healthcare.

10. The social benefits of kaizen initiatives in healthcare: an empirical study (2018)

Drawing on the input-process-outcome framework, applied to kaizen initiatives, the determinants of the input and process factors are embodied in hypotheses concerning the direct effects of input and process factors on social outcomes and the indirect effects of input factors on social outcomes resulting from process factors. The hypotheses are tested through multiple regressions using data from 105 kaizen initiatives drawn from two hospital.

1.1 RESEARCH QUESTION

Can kaizen approach significantly improve service delivery through evidence-based elimination of wastes?

1.2 OBJECTIVES

To improve service delivery in identified departments of a hospital using kaizen 5-S approach for a specific problem for reducing or elimination of wastes.

1.3 HYPOTHESIS

H₀: There is no difference in service delivery before and after implementation of Kaizen 5-S approach

H₁: There is difference in service delivery before and after implementation of Kaizen 5-S approach

1.4 APPROACH

A pretest- intervention- post-test was done on kaizen 5-S implementations to a specific problem for service delivery indicators.

Chapter 3:

RESEARCH METHODOLOGY

3.1 STUDY DESIGN: Pre-test intervention and Post-test Experimental Design.

3.2 STUDY POPULATION: 6 different departments of Sankara Eye Hospital, Coimbatore: Registration Department, Stores, Pharmacy Department, Linen & Laundry, Laboratory Department, MRD.

3.3 STUDY TOOLS: Kaizen card, 5-S tool, 5S score card sheet, Photos “before/after”

3.4 DURATION OF STUDY: 3 months

3.5 SAMPLE SIZE: 20 Kaizens from 6 different departments

3.6 SAMPLING TECHNIQUE: Convenience Sampling Technique

3.7 DATA COLLECTION PROCEDURE: The research was conducted in three stages:

1. **Situation analysis:** This is the first stage done by utilizing a self-administrated, structured questionnaire (Kaizen Idea cards) for the employees, direct

observation of the process, conducting in-depths interviews with the employees.

2. **Implementation phase:** The second stage is the implementation stage, which is consisted of orientation sessions, and lectures on the 5S-KAIZEN approach.
3. **Evaluation phase:** The final stage is performed using Kaizen 5-S Score card Sheet in order to assess the effect of the 5S-KAIZEN approach in the organization

3.8 DATA ANALYSIS PLAN

Analysis was carried out using Excel sheet on the data gathered. Also, analysis was done upon non-parametric indicators which in turn is anchored to type of problem. Then, Chi squared test is envisaged for testing the significance of improvement .

Chapter 4:

RESULTS

1. Situation Analysis Phase

This stage was performed, including the employees in order to identify the problems that could lead to the dissatisfaction of the healthcare staff and patients and discern the challenges associated with the quality of health services provided by the hospital.

A structured, self-administrated questionnaire was distributed among the 20 employees, of six different departments, 35 ideas were generated out of which 24 ideas were implemented at a compliance rate of 69%. The kaizen card consisted of problem area, suggestions, implementation ideas including administrative services and quality of functional performance

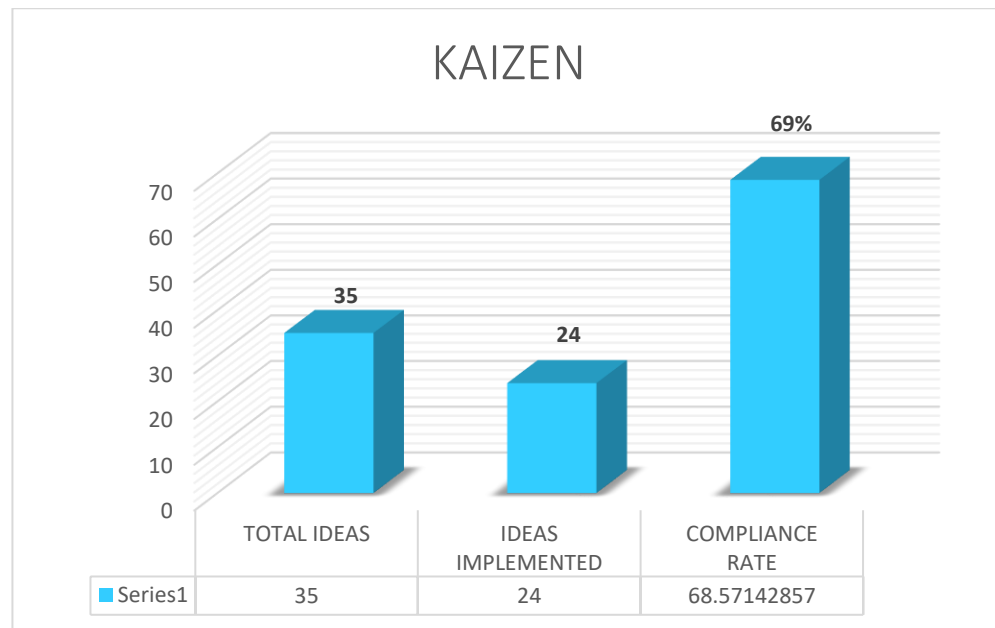


Figure 1.1 overall situation chart

2. Intervention Phase

A: Planning and Preparation Stage

- Developing training programs on the 5S-KAIZEN approach, consisting of presentations for the trainers, and pre-test and post-test for the training programs.
- Developing orientation pictures about the 5S-KAIZEN approach and quality of care services to be distributed in all the 6 hospital departments;

B: Implementation Stage

Four orientation sessions were held about the concept of the 5S, as well as the aim, importance, and benefits of improving the work environment. Additionally, a two-hour presentation was held to compare the current situation of the selected hospital with the various other organizations. Training course was conducted for the staff twice, each of which encompassed, focusing on the 5S-KAIZEN approach, improvement of the work environment, quality improvement, staff productivity, and leadership and communication skills.

The 5S tools was initially implemented in six pilot areas inside the hospital under observation and the constant monitoring, , so as to assess the progress of the implementation phase.

3. Evaluation Phase:

In the current study, the hospital staff had a clear knowledge of the significance, objectives, and positive effects of the 5S-KAIZEN approach on their work environment. Out of 6 departments of the hospital, 3 departments (Stores, Registration and pharmacy) have showed remarkable improvement, another 3 departments (laboratory, laundry, and MRD) are under process of improvement

Pre-test and Post-test photographs were taken for assessment of the progress of approach. Chi-square test was used for testing the null hypothesis for 3 departments out of 6.

3.1 IMPLEMENTATION STAGE

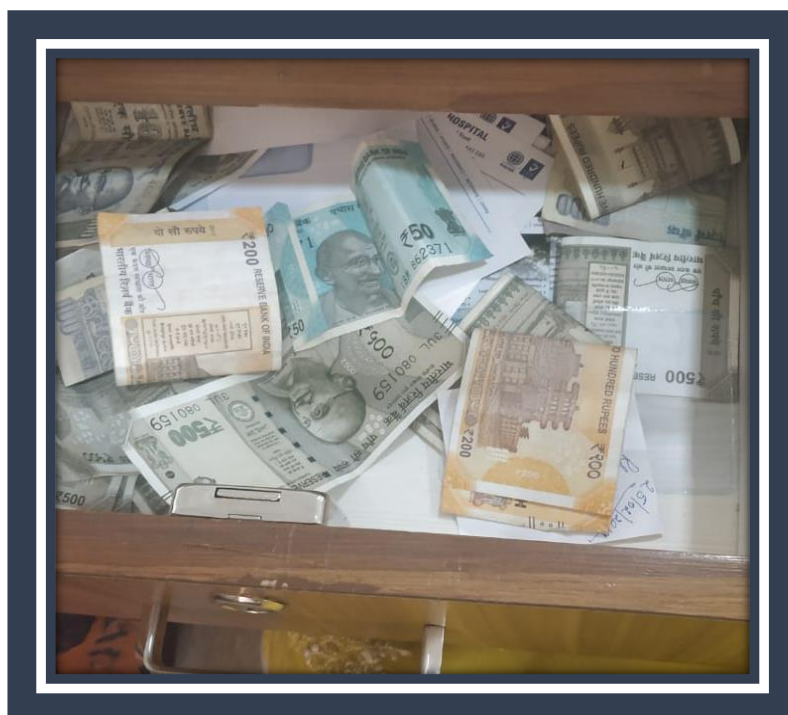
BEFORE 5-S KAIZEN



AFTER 5-S KAIZEN



BEFORE 5-S KAIZEN



AFTER 5-S KAIZEN



BEFORE 5-S KAIZEN



AFTER 5-S KAIZEN



BEFORE 5-S KAIZEN



AFTER 5-S KAIZEN



Calculations:

STORES			
	LOW EFFORT	HIGH EFFORT	TOTAL
PRE	35	4	39
POST	3	36	39
TOTAL	38	40	78

Table 3.1 Chi-square contingency table for stores.

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

O = the frequencies observed

E = the frequencies expected

$\sum$ = the 'sum of'

For the degree of freedom **1** , value of chi-square is **52.54** and p-value is **0.0039** which is lesser than **0.05** , hence we reject the null hypothesis. . Indicating there is statistically significant improvement after implementation 5-S Kaizen.

PHARMACY			
	LOW EFFORT	HIGH EFFORT	TOTAL
PRE	34	5	39
POST	7	32	39
TOTAL	41	37	78

Table 3.2 Chi-square contingency table for pharmacy.

For the degree of freedom **1** , value of chi-square is **53.11** and p-value is **0.0039** which is lesser than **0.05** , hence we reject the null hypothesis. . Indicating there is statistically significant improvement after implementation 5-S Kaizen.

REGISTRATION			
	LOW EFFORT	HIGH EFFORT	TOTAL
PRE	37	2	39
POST	8	31	39
TOTAL	45	33	78

Table 3.3 Chi-square contingency table for registration.

For the degree of freedom **1** , value of chi-square is **44.12** and p-value is **0.0039** which is lesser than **0.05** , hence we reject the null hypothesis. Indicating there is statistically significant improvement after implementation 5-S Kaizen.

Chapter 5:

CONCLUSION

According to the results, the hospital staff reported that the application of the 5S-KAIZEN approach in the hospital saved time and effort, decreased work-related stress, reduced supply waste, improved staff and patient safety, and enhanced communication, efficiency, productivity, and problem-solving capability. Therefore, the 5S-KAIZEN approach could achieve the difficult balance between low costs and high productivity, while it also addresses the safety, comfort, and satisfaction of the healthcare staff, which is indirectly reflected in the quality of care services and patient satisfaction.

RECOMMENDATION

- Use of i-kaizen Software tool for easy application and filling of kaizen card.
- Appreciation awards can be given to best implemented kaizen department for motivating employees.

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Application of the 5S-KAIZEN Approach in Improving the Productivity and Quality of the Healthcare System: An Operational Research Naglaa Abdel Khalek El-Sherbiny¹ (MD); Asmaa Younis ELsary¹ (MD); Eman H. Ibrahim¹ (MD) Department of Public Health, Faculty of Medicine-Fayoum University, Egypt.

Suárez-Barraza, M.F., Ramis-Pujol, J., 2012. An exploratory study of 5S: a multiple case study of multinational organizations in Mexico. *Asian Journal on Quality* 13, 77–99. doi:10.1108/15982681211237842

KAIZEN IDEA CARD

GENERAL INFORMATION:

Employee Number.: _____ Date _____
 Originated _____
 Department : _____

PROBLEM/S:

 -

IDEAS:

EXPECTED BENEFITS:

☐ Better process ☐ Customer Service ☐ Cost Saving ☐ High Quality
☐ Safety ☐ Long Term Fix ☐ Others

IMPLEMENTATION STEPS :

VERIFYING INFORMATION:

Pictures: Before: ☐ Yes ☐ No
 After: ☐ Yes ☐ No

OFFICE USE ONLY:

Input Data: ☐ Yes ☐ No
 Import Pictures : Before: ☐ Yes ☐ No