

A study to implement 5s methodology in ambulance material management in a tertiary...

[Health & Medicine](#), [Hospital](#)



The main basic idea and the primary purpose of an ambulance are to transport the sick, unwell, or injured person from the emergency condition to the hospital. The well-equipped and well prepared ambulances have the most impact and play an important role in saving lives of patients in critical condition. The lack of basic materials also may lead to the death of the patient. The aim of this study was to apply 5S methodology to improve quality in Ambulance Material Management. The standard checklist has been prepared according to the National Ambulance Code to check the compliance of the materials available inside the ambulance but most of the materials were not found.

5s Methodology has been applied in specific areas of Ambulance Service like cupboards, lockers, drawers and sinks with the help of 5s tools like Alignments and labeling. After 5s Implementation in Ambulance Material Management in Advanced Life Support (ALS) ambulance the overall percentage of materials compliance to the National Ambulance Code was increased from 27.08% to 62.5% and 35.38% to 60.00% in Basic Life Support (BLS) ambulance. It was found a drastic change after implementation of 5s in Ambulance material management. Before and after pictures are taken for applying 5s Methodology in Ambulance Material Management. A standard manual has been prepared for ambulance technicians and drivers for further reference.

INTRODUCTION

Pre hospital emergency care is an integral part of healthcare delivery systems. In order to provide appropriate and timely pre hospital emergency

medical services (EMS), many factors such as skilled staff, speed of services, and affordable medical equipment's are involved¹. Function is to transport a patient to the hospital. Not only does an ambulance transport patient, it creates a pre-hospital set up inside the ambulance which is run by a team of qualified professionals like a Doctor, nurse, Emergency Medical Technicians (EMT) and the driver who as a team have been trained to handle emergencies and provide life-saving treatment. Ambulance services bring value not just to patients but also to the healthcare system as a whole. Now the service can provide 24 hour emergency service that assists home nursing and supplies medical devices/aids like home oxygen, bed, etc. In some situations the medical standby and first aid coverage can be provided.

The emergency medical technicians and paramedics should be perfectly equipped with the life-saving equipment needed. It is necessary to follow quality improvement procedures, like Safe handling of patients and their property, Proper maintenance of all vehicles and medical equipment, proper cleaning of vehicles and equipment, Decontamination when required etc. 5s can be a one of the important method to improve the quality in ambulance material management. 5s is a lean principle that focuses on reduction of waste; it is done to investigate opportunity for improvement. 25s: It include five Japanese words Seiri(Sort), Seiton(Set in order), Seiso(Shine), Seiketsu(Standardize) and Shitsuke(Sustain). The 5S philosophy focuses on simplification of the work environment, effective workplace organization, and reduction of waste while improving safety and quality³. The first S, sort, is about removing items that do not belong or are not needed in the workplace.

Straighten, the second S, focuses on having a place for everything in the best possible manner. Shine the third S, sets the pace of the classical idea of housekeeping, inspection, and preventative maintenance by making sure everything is clean. The cleaner an area is, the easier it is to identify issues that may hurt quality. The fourth S, standardize, is what allows the recursive process of the first three S's to occur by creating standard procedures. Fifth S, sustain, which keeps the lean implementations maintenance in the long-term and ideally part of the culture. The 5S's characterize a continuous process for creating and maintaining an organized, clean, and safe high-performance environment.

The 5S practice is seen as an effective technique that can improve quality, environmental performance, and health and safety standards in their workplace. The 5S practice plays an important role facilitating the introduction and development of other quality and continuous improvement methods and techniques

LITERATURE REVIEW

As a result of using Lean methodology, many health systems have realized major improvements in quality, safety and efficiency. Lean has led to cost-saving initiatives, as well as others that avoid costs. It is an innovative and easy way to engage frontline staff to understand issues and create better ways to work. Lean offers a set of tools and concepts that can improve healthcare⁵. The study shows that 5S applied to healthcare settings can improve processes and work environments and in some instances improve safety through standardization. HealthCare organizations are increasingly

employing Lean tools in an effort to reduce waste while providing high quality healthcare and 5S is one of the more popular tools in use to achieve Lean healthcare⁶. Ten week study is carried out in the case company. The results after the 5S implementations states that production system efficiency is improved from 67% to 88. 8% in the successive week. The present paper demonstrates the implementation of 5S a lean manufacturing techniques in small scale industry. Lean manufacturing is one of the options to reduce non value-added activity (wastes) and improve operational efficiency of the organization. The efficient implementation of 5S technique leads to subsequent improvement in productivity of the manufacturing plant. The 5S improves environmental performance and thus relate primarily in reduction of wastes in manufacturing. It promotes neatness in storage of raw material and finished products⁷. With the 5S methodology implementation, the school laboratories have become industrial laboratories; they have been adapted to the conditions of security and organization that are usually found in the metalworking industry.

Learning, control and maintenance of the resources and activities involved are performed in less time and with a considerable reduction of cost. There is also an increase in available space available for the location of the resources. The new culture has resulted in an improvement of the working environment and an increase in the motivation of the staff involved⁸. They introduced 5S methodology to the workers on the shop floor and carried out a questionnaire for them. After that all the 5 rules of the 5S has been implemented on the shop floor in a systematic order. We appointed one of

the workers as a person responsible for the implementation of 5S for that department and so with the other departments of the industry. This resulted in great changes on the shop floor changes in the shop floor⁹. The 5S methodology is the systematic risks reduction. 'zero accidents and injuries' becomes viable when the accident prevention, risk identification and elimination is an integral part of the 5S programme. ¹⁰The implementation of 5S practices in the manufacturing companies, data is collected from the sample of a population with the help of reliable and suitable questionnaire. The study started with understanding background of the company recognizing divisions to be accessed based on the company come out comes with the complete 5S checklist for each division for auditing process. The outcome reveals that both the organizations have excelled in 5S practice¹¹.

METHODOLOGY

Aim

To apply 5S methodology to improve quality in Ambulance Material Management

Objectives

1. To study the process of the ambulance service
 2. To check the compliance of material management in Ambulance Service
 3. To apply the 5s methodology in Ambulance Material Management
 4. To Recommend standard manual to the Ambulance Service
- METHODSA
prospective study was conducted at a Tertiary Care Hospital in Bangalore.

The study was to improve the quality by applying 5s methodology in ambulance material management. By interacting with ambulance personnel and through observation the primary data was collected and process mapping has drawn. The compliance of the available materials with the help of a standard checklist was carried out. The checklist was prepared according to the National Ambulance Code. Implemented 5s methodology in Ambulance Material Management and recommended standard Manual to the Ambulance Technicians and Drivers. RESULTS After process mapping has been drawn, found some gaps in the process flow related to material management that is while shifting the patient to ambulance and the ambulance paramedic searches for the materials, because of poor material management, so there it is getting delayed.

With the help of standard checklist which was prepared according to National Ambulance Code just to check compliance with the materials available in the ambulance. After compliance was checked most of the materials were missing which helps to provide quality of care to the victims 5s methodology have been implemented since it is a quality tool in a particular area. The results shows the improvements in pilot areas where 5s has been implemented. Figure 1. The overall percentage of materials that comply with National Ambulance Code in ALS Ambulance. The graph explains the overall percentage of materials that compliance to the National Ambulance Code in ALS Ambulance. Here, before 5s implementation only 27. 08% of materials compliance to the NAC and after implementing 5s in ALS Ambulance the overall percentage of materials that compliance to NAC was increased to 27. 08% to 62. 50% that shows a good result. Figure 2. The overall percentage of

materials that comply National Ambulance Code in BLS Ambulance. Before implementation of 5s methodology in BLS Ambulances, the results shown that the overall percentage of materials compliance to the National Ambulance Code was 35.38%. After implementation of 5s, it was found that the overall percentage of materials compliance to the National Ambulance Code increased from 35.38% to 60.00% which shows that 5s implementation has given good results.

The manual mainly consists of importance of 5s methodology, steps involved in 5s implementation and standard checklist is also provided. Also provided one days training program to the Ambulance Personnel..

DISCUSSIONS

The present study revealed that Before implementation of 5s methodology in ALS Ambulance, 27.08% of materials compliance with National Ambulance code, after implementation, it was found that 62.5% of materials compliance with National Ambulance code. Before implementation of 5s methodology in BLS Ambulances, the results showed that the overall percentage of materials compliance to the National Ambulance Code was 35.38%. After implementation of 5s, it was found that the overall percentage of materials compliance to the National Ambulance Code increased from 35.38% to 60.00% which shows that 5s implementation has given good results. By applying 5s methodology in material management in ambulance there was a drastic change managing materials, that is by organizing, labeling and by discarding outdated consumable and after implementing 5s, majority of materials compliance to the National Ambulance Code in both ALS and BLS

Ambulance. This was supported by other study, which was conducted by Farrokh R Farrokhi in 2013, after implementing 5s they reduced the number of instruments for minimally invasive spine surgery by 70% (from 197 to 58), and setup was time decreased to 37% (13. 1-8. 2 min, $p = .0015$)¹².

After implementing 5s Methodology in Ambulance Material Management, 100% compliance was not seen in the result, the reason being the all the materials were kept in Accident and Emergency Department, whenever the materials are required it is taken. This is due to pilferage, space constraints and improper handling of the materials. CONCLUSION 5S program has lot of change in the work place like removing unwanted items, improvement in orderliness, improved in labeling etc. ¹³ The outcome of the study in ambulance material management explains clearly that 5s implementation is seen as an effective technique that helps to maintain a clean, tidy, and safe environment inside the ambulance in a good manner. It can be observed that there was a great change in ambulance material management after 5s methodology. 5s promotes employees to work efficiently and effectively. ¹⁴ Based on quality pillars, 5S forms a robust ground for advanced quality systems and various innovations. Found obstacles in effective 5s implementation, that is ambulance drivers and nursing staffs were not aware of this activity and found lack of training. Hence one day training program has been given.