



## REVIEW ARTICLE

# Study of workload and utilisation of Central Sterile Supply Department of a Tertiary care Teaching hospital

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### Abstract

Hospital acquired infection or “nosocomial infection” adversely affects both patients and hospitals. Impact of nosocomial infections ranges from increased length of hospital stay, emotional stress, disability, death of the patients as well as increased hospital cost for the patients and providers. Studies in India have reported nosocomial infection rates from 8% to 58 %.

To combat these infections, hospital needs effective methods of disinfection and sterilization which has nowadays been centralized into a single department called Central Sterile Supply Department.

In our study, the utilization coefficient of Autoclaves was found to be 75% while utilization coefficient of Plasma sterilizer was found to be 50 %. Hence both the equipments are adequately used above the efficiency co-efficient.

Keywords: Central sterile Supplies, Sterilisation, Hospital Infections, workload, utilization

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## 1 | INTRODUCTION

Central sterile supplies department (CSSD) is a service unit in a hospital that processes, issues, and controls the sterile stores supply to all departments of the hospital. It can be defined as that service, with in the hospital, catering for the sterile supplies to all departments, both to specialized units as well as general wards and OPDs. Ideally, CSSD is an independent department with facilities to receive, clean, pack, disinfect, sterilizes, store and

distribute instruments as per well-delineated protocols. The essentials of this department are correct design, appropriate equipment's, skillful operators and proper work flow (1)

**Supplementary information** The online version of this article (XXXXXXX) contains supplementary material, which is available to authorized users.

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CSSD is established to make reliably sterilized articles available at the required time and place for any agreed purpose in the hospital as economically as possible. It works in collaboration with the Infection Control Committee and other hospital programmes to develop and monitor policies on cleaning and decontamination of: reusable equipment, contaminated equipment including wrapping procedures, according to the type of sterilization and sterilization conditions (e.g. temperature, duration, pressure, humidity). Efficiency of the sterilization process totally depends on the results shown by the chemical and biological indicators incorporated during the process of sterilization. (2)

In order that the hospital may properly discharge its duty of safeguarding human life that operative skills may be made as effective as possible, it is necessary that adequate sterilization procedure be carried out. Infection is a health hazard of great exposure and significance affecting the final outcome of the treatment. The quality of life, both physical and psychological can be drastically altered, sometimes permanently by infection and associated 4D's that is delayed healing, discomfort, distress, dependency and dollars (rupees). It is perhaps the C Introduction Department of Hospital Administration 2 single most important factor that adversely affects the performance and image of the hospital. (3)

The current study was conducted to study the workload and utilisation in Central Sterile Supply Department of SKIMS, (Jammu and Kashmir) as Central Sterile Supply Department has central role in reducing hospital acquired infection.

### Objective

To Study workload and utilisation of Central Sterile Supply Department of a Tertiary care Teaching hospital

## 2 | METHODOLOGY

To study the workload in the central sterile supply department Workload in Central sterile supply Department was conducted in two parts;

- 1) Prospective Study.
- 2) Retrospective Study.

For prospective and retrospective study record of monthly, yearly cycles and items Sterilized by autoclave and plasma sterilizer were collected and recorded on predesigned performas.

**Prospective study:** A Prospective study was carried out for six months from 1 st January 2019 to 31st June 2019 by direct observational method and study of daily records available in the department. The workload of each equipment i.e. Steam sterilizer (Autoclave), and Hydrogen Peroxide Plasma sterilizer was calculated according to predesigned annexure.

**Retrospective study:** A Retrospective study was carried for a period of three years from 1st January 2016 to 31st December 2018. Monthly and yearly load /cycles in the central sterile supply department was studied / collected from the record available in the Department.

### Utilization of sterilization equipment

Utilization index or Utilization co-efficient is one of the most important parameters to monitor the functional status of the equipment. It is the parameter to assess the productivity of a service or equipment. There are 2 autoclaves in the C.S.S.D of SKIMS, Soura. Their utilization is measured in terms of the utilization index or co-efficient. It is the most important parameter to monitor the functional status of the autoclaves and to assess their productivity.

It is given by the following formula: Use coefficient =  $N/M \times 100$  Where; N = Average number of hours the equipment is used per day. M = Maximum number of hours the equipment can be used per day.

## 3 | DATA ANALYSIS

The data was received from the answered questionnaires and was plotted on excel 2013. The data was analyzed statistically with the help of statistical software SPSS v19. All the continuous variables of the study were represented by the descriptive statistics and all the categorical variables in the term of frequency and percentage.

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## 4 | RESULT AND DISCUSSION

The Central Sterile Supply Department is the service responsible for receiving, storing, processing, distributing and controlling the professional supplies and equipments (both sterile and non sterile) for all user unit of hospital for the care and safety of patient under strict quality control.

Hospital acquired infection or “nosocomial infection” adversely affects both patients and hospitals. Impact of nosocomial infections ranges from increased length of hospital stay, emotional stress, disability, death of the patients as well as increased hospital cost for the patients and providers. Studies in India have reported nosocomial infection rates from 8% to 58 %.

To combat these infections, hospital needs effective methods of disinfection and sterilization which has nowadays been centralized into a single department called Central Sterile Supply Department.

In 1928, the American college of surgeons initiated centralization of all surgical supplies and dressings in one unit for supply to all departments of the hospital. Thus, the concept of Central sterile supplies department began in the hospitals. During the Second World War, the British Army established a Central sterile supplies department in Cairo for supply of sterile items to mobile units.

In India, one of the earliest Central sterile supplies departments was established by Safdarjung hospital, Delhi and Christian medical college, Vellore during 1957-60.

Central sterile supplies department in SKIMS is centralized service and was commissioned along with the 1st phase of the hospital in December 1982.

Central sterile supplies department is located on the ground floor (in services core area of the hospital).

### Workload

Workload was calculated for two autoclaves and one plasma sterilizer. The workload was studied by undertaking a prospective study of six months and retrospective study of three years.

1. **Workload of Autoclave** In prospective study the average number of autoclaving cycles done

per month on two autoclaves were 194 and average items sterilized were 18967 for the year 2019 (6 months) and in our retrospective data the number of average autoclaving cycles done per month on two autoclaves was 150 and 188 for the year 2016 and 2018 respectively and average number of items sterilized were 13405 and 18450 for the year 2016 and 2018 respectively.

In a Study by Keerthi Kakinda et al (4) regarding the number of autoclaving cycles done per month on an average on autoclaves was 142 and 4723 sets /items were sterilized on an average in a month. In another research study by Swapna C Shetty (5) showed that Average number of items autoclaved in the C.S.S.D. in a day were 898.

2. **Work load of plasma sterilizer** In our study it was observed that the cycles done per month on an average on plasma sterilizer was 81 and 5516 items were sterilized on average in a month for the year 2019 (6 months) prospectively. The number of cycles done per month on an average on plasma sterilizer was 33 and 63 for the year 2016 and 2018 respectively and 2137 and 3754 items were sterilized on average in a month for the year 2016 and 2018 respectively on our retrospective data. In a study conducted at TATA memorial hospital, Mumbai plasma sterilizer had 25 cycles per month and total items sterilized were 90 per month. (6)

### Utilization of Equipments

According to Shakti Gupta and Sunil Kant (7) , utilization essentially means the use of equipment to the full potential. Utilization index or coefficient is one of the most important parameters to monitor the functional status of the equipment. If it is less than 50% the equipment is considered to be underutilized. A study carried out by Libert Anil Gomes et al on the utilization of autoclaves in KMC Hospital Manipal showed that on the whole the percentage utilization of the 3 autoclave was 92%. Comparing it with another study conducted by Swapna. C. Shetty (5) revealed that utilization co-efficient shows that on an average the percentage utilization of the 2 autoclaves together per day is 75% In our study the utilization coefficient of Central Sterile Supply Department

shows that on an average the percentage utilization of the 2 autoclaves is 75%.and it was also observed that utilization coefficient of Central Sterile Supply Department shows that on an average the percentage utilization of the plasma sterilizer is 50%. According to Shakti Kumar Gupta and Sunil Kant (7) (2000), the sterilization equipment should be used for four to six hours cycle in 24 hours.

### Summary

In the study it was observed that the average Workload of Autoclaves per month is 194 and 18967 number of items were sterilized. Similarly, average cycles done per month on Plasma Sterilizer are 81 and 5516 items were sterilized on average in a month.

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