A STUDY ON KNOWLEDGE, AWARENESS AND PRACTICES OF BIOMEDICAL WASTE MANAGEMENT AND INFECTION CONTROL AT CIVIL HOSPITAL, ROPAR, PUNJAB

Guided by:
Dr. P. R. Sodani
Acting President and Dean-Training

Submitted by:
Jashanmeet K Hans
MBA HM 21 (Hospital)
Roll No. 0428

INTRODUCTION

Bio medical waste means any waste, which is generated during diagnosis, treatment or immunization of human beings or animals or research activities pertaining thereto or in the production or testing of biological or in health camps. It is an emerging issue of major concern not only to the hospitals but also to the environment. The proper management of biomedical waste plays a very important role in any hospital to avoid the adverse and harmful effects to the environment including human beings which are caused by 'Hospital waste' generated during the patient care. Hospital waste is a potential health hazard to the health care workers. The problems of the waste disposal in the hospitals and other health care institutions have become issues of major concern.

The Government of India (notification, 1998) specifies that Hospital Waste Management is a part of hospital hygiene and maintenance activities. This involves management of range of activities which includes collection, transportation, operation or treatment of processing systems and disposal of wastes.

World Health Organization states that 85% of hospital wastes are actually non-hazardous, whereas 10% are infectious and 5% are non infectious but they are included in hazardous wastes. About 15% to 35% of hospital waste is regulated as infectious waste. This range is dependent on total amount of waste generated.

Need of biomedical waste management in hospitals

The reasons due to which there is great need of management of hospitals waste such as:

- Injuries from sharps leading to infection to all categories of hospital personnel and waste handler.
- Nosocomial infections in patients from poor infection control practices and poor waste management.
- Risk of infection outside hospital for waste handlers and scavengers and at time general public living in the vicinity of hospitals.
- Risk associated with hazardous chemicals, drugs to persons handling wastes at all levels.
- “Disposable” being repacked and sold by unscrupulous elements without even being washed.
- Drugs which have been disposed of, being repacked and sold off to unsuspecting buyers.
- Risk of air, water and soil pollution directly due to waste, or due to defective incineration emissions and ash.

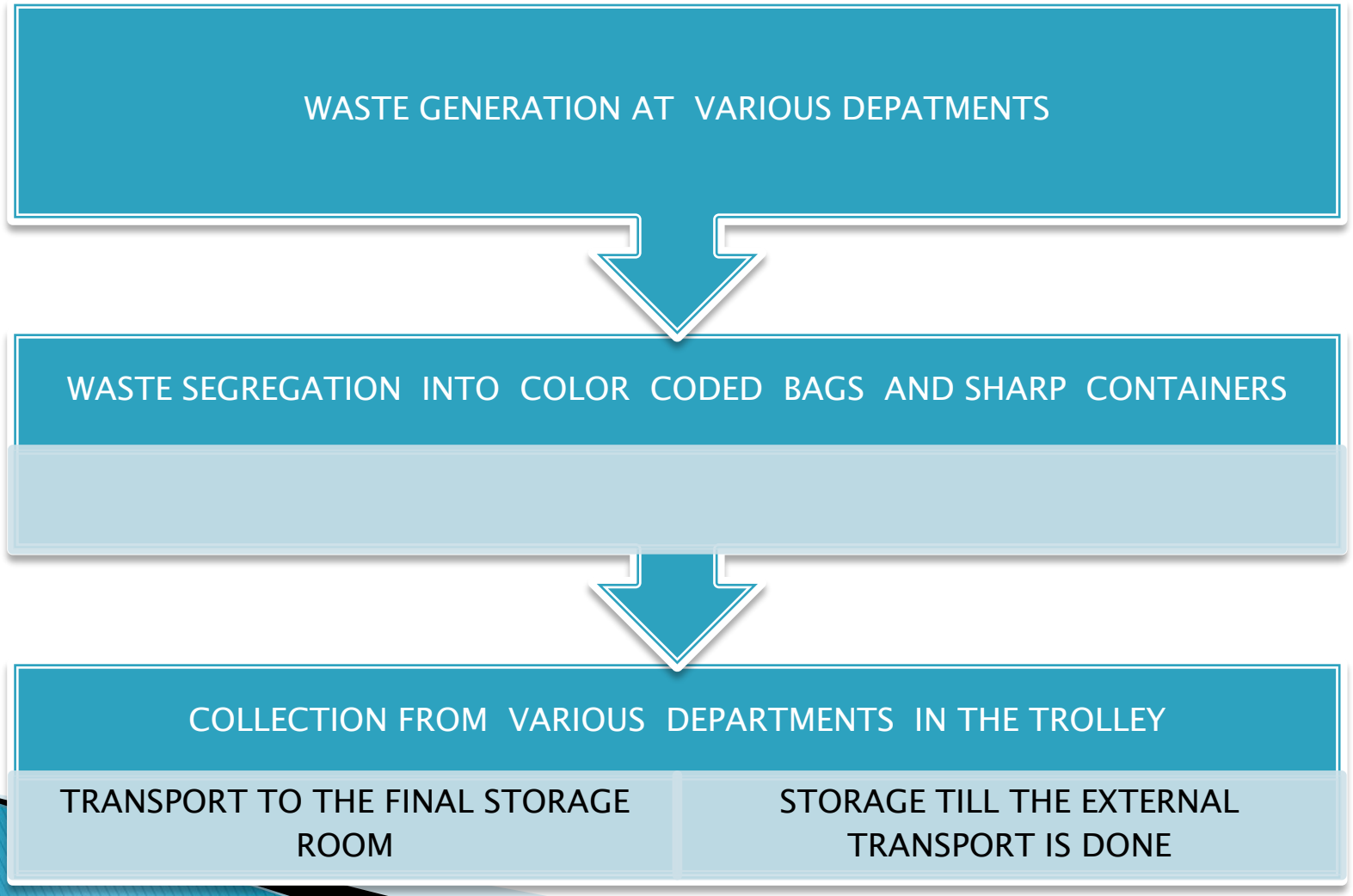
Biomedical Waste Management Process

There is a big network of Health Care Institutions in India. The hospital waste like body parts, organs, tissues, blood and body fluids along with soiled linen, cotton, bandage and plaster casts from infected and contaminated areas are very essential to be properly collected, segregated, stored, transported, treated and disposed of in safe manner to prevent nosocomial or hospital acquired infection.

- Waste collection
- Segregation
- Transportation and storage
- Treatment & Disposal
- Transport to final disposal site
- Final disposal

PROCESS FLOW OF BIO MEDICAL WASTE MANAGEMENT IN THE HOSPITAL

Terminal numbers have been provided for each department.



OBJECTIVES OF THE STUDY

- To determine the knowledge and awareness among hospital staff regarding biomedical waste management policy and practice.

- To determine their awareness regarding needle-stick injury and its prevalence among different categories of health care providers.

- To assess the current practices of bio-medical waste management in the hospital.

- To assess the practices of infection control in the hospital.

METHODOLOGY

- **STUDY DESIGN:** Cross sectional study

- **SETTING:** Civil Hospital, Ropar, Government of Punjab

- **DURATION OF STUDY:** February 2018 to April 2018 (3 months)

- **SAMPLE SIZE:** A sample size of 100 staff members will be taken – will include 20 doctors, 25 nursing staff, 30 student nurses on training, 10 housekeeping staff and 15 laboratory technical staff.

- **SAMPLING TECHNIQUE:** Simple random sampling

- **SAMPLE SELECTION:** The inclusion criteria will be all the healthcare professionals at the hospital (doctors, nurses, technical staff, and housekeeping staff etc.) who are available for the study and are willing to participate. The exclusion criteria will be those who decide to exercise their right not to participate in the study.

•**DATA COLLECTION INSTRUMENTS:** To collect the required data on KAP of biomedical waste management and infection control, the following study tools will be prepared: 1) Questionnaire for Doctors 2) Questionnaire for Nursing and Technical Staff 3) Questionnaire for Housekeeping Staff 4) Observation Checklist

8. **DATA COLLECTION PROCEDURE:** Data will be collected from the hospital staff from all departments and wards by interacting with them and observing the waste management practices. These interactions and observations will be conducted by a self structured questionnaire and checklist.

9. **DATA ANALYSIS:** Data will be analysed with the help of advance Microsoft Excel function.

Results

A self structured questionnaire was developed for the doctors, nurses, student nurses on training, laboratory technicians and housekeeping staff.

The questionnaire was developed in the framework to assess the knowledge, awareness and practices of biomedical waste management and to assess the infection control measures among the hospital staff. The data was collected by interacting with the staff by asking them questions from the questionnaire.

Along with the questionnaire, an observation checklist was also developed and the practices of bio medical waste management and handling and infection control measures were observed through the checklist.

Data was analyzed with the help of Advanced Microsoft Excel Function.

QUESTIONNAIRES AND OBSERVATION CHECKLIST USED FOR THE STUDY-

- **Questionnaire** for Doctors for assessment of knowledge and awareness of Biomedical waste Management-

- In which year the Bio medical waste management rules were first proposed?
- Implementation in the biomedical waste (Management and Handling) rules was made in which year?
- According to Biomedical waste (Management and Handling) rules, waste should not be stored beyond how many hours?
- Who regulates the safe transport of Bio medical waste?
- The use of chlorinated plastic bags, blood bags and gloves should be phased out within how many years?

- According to Biomedical waste (Management and Handling) rules 2016, the waste has been classified in how many categories?
- According to Biomedical waste (management and handling) rules 2016, Installation of In-house incinerator is allowed or not?
- Chemical pre-treatment is required for which type of wastes?
- Accident reporting in case of any major accident while handling biomedical waste should be done to the prescribed authority within how many hours?
- Do you think it is important to know about bio medical waste generation and legislation and do you know about the color coding segregation of bio medical waste and do you follow the correct practice in your hospital?

Questionnaire on Knowledge of Biomedical Waste Management for Nurses and Student Nurses on Training

- **Questionnaire** on Knowledge of Biomedical Waste Management for Nurses and Student Nurses on Training-
- Which diseases can be transmitted by improper handling of biomedical waste?
- Do you know about the color coding segregation of Bio medical waste?
- Do you according to 2016 rules bio medical waste has been classified into how many categories?
- Needles, syringes with fixed needles, scalpels, blades, or any other contaminated sharp object that may cause puncture and cuts should be disposed off in which color codes bin?
- Gloves even the soiled one to be disposed off in which color coded bin?
- The pre-treatment of liquid waste should be done with how much percentage of sodium hypochlorite solution?
- The blue color coded bins to be made of?
- Mutilation or shredding of needles is to be done to prevent?
- What are the treatment or disposal options for discarded or expired medicines?
- The color code of biomedical waste to be autoclaved and disinfected is?

Questionnaire for Housekeeping for assessment of knowledge and awareness of bio medical waste management

- Do you think it is important to wear protective gears (gloves, masks, gum boots) while handling bio medical waste management?
- Are aware of the diseases or hazards that can occur by improper handling of bio medical waste?
- How are the sharps managed?
- Syringes without needles should be disposed off into which color coded bag?
- Needles and syringes with fixed needles should be disposed off into which color coded bag/container?
- Items contaminated with blood should be disposed off into which color coded bag?
- What is the collection method from the point of generation?
- How is the waste carried from the point of generation to the final disposal site?
- Are you aware to who to report on getting a needle stick injury and what measures to adopt immediately on getting the injury?
- Waste should not be stored to the final disposal site for more than how many hours?

Assessment of Practices of Bio medical waste management

- Are you following the color coding of Bio medical waste management?
- Do you think it is important to report the needle stick and sharps injuries?
- Do you think that wearing personal protective equipments is necessary while handling Bio medical waste?
- Do you think you have adequate knowledge about Bio medical waste management?
- Do you think you require any more trainings regarding proper management of bio medical waste management?
- For enhancement and up gradation of your knowledge about bio medical waste management, would you like to attend any voluntary programmes / trainings?
- Do you think that liquid waste should be pre treated with sodium hypochlorite solution?
- Do you think the gloves and glucose bottles should be cut before disposal into color coded bins?
- Do you think needle stick injury a matter of concern and are you aware of the consequences of needle stick injury?
- Do you recap the used needle and discard it immediately after use?

- **<u>Questionnaire</u>** on assessment of Level of knowledge among nurses, doctors, lab technicians and housekeeping on needle sticks injuries-
- Is needle stick injury a matter of concern?
- Do you think that it is important to recap the used needle?
- Do you think that it is important to discard the used needle immediately?
- Are you aware of the consequences of needle stick injury?
- How do you think the needle stick injuries can occur?

- **Questionnaire** on assessment of infection control practices among doctors, nurses, lab technicians and housekeeping-
- Do you feel it is important to use personal protective equipments?
- Do you follow five moments of hand washing?
- Do you follow six steps of hand washing?
- Do you feel it is important to use fresh gloves before each new patient procedure?

OBSERVATION CHECKLIST

- Maintenance of records
- Needle shredders are provided/present in each department
- Color coded containers provided
- Segregation properly done
- Whether bio medical waste regularly lifted by common biomedical waste treatment facility (CBWTF)
- Whether discarded medicines/expired medicines stored separately in yellow bag
- Pre-treatment to Microbiology / Blood Bags etc. with autoclave
- Final treatment to liquid waste
- Non-chlorinated bags used
- Whether final storage room/tank provided with Lock-key
- Bar-code sticker pasted on color coded bag/container
- Training to health-workers provided and record maintained
- Immunization to health-workers provided
- PPEs used by health workers during handling BMW
- BMW Committee constituted in the hospital

Knowledge and awareness of Bio medical waste management among hospital staff

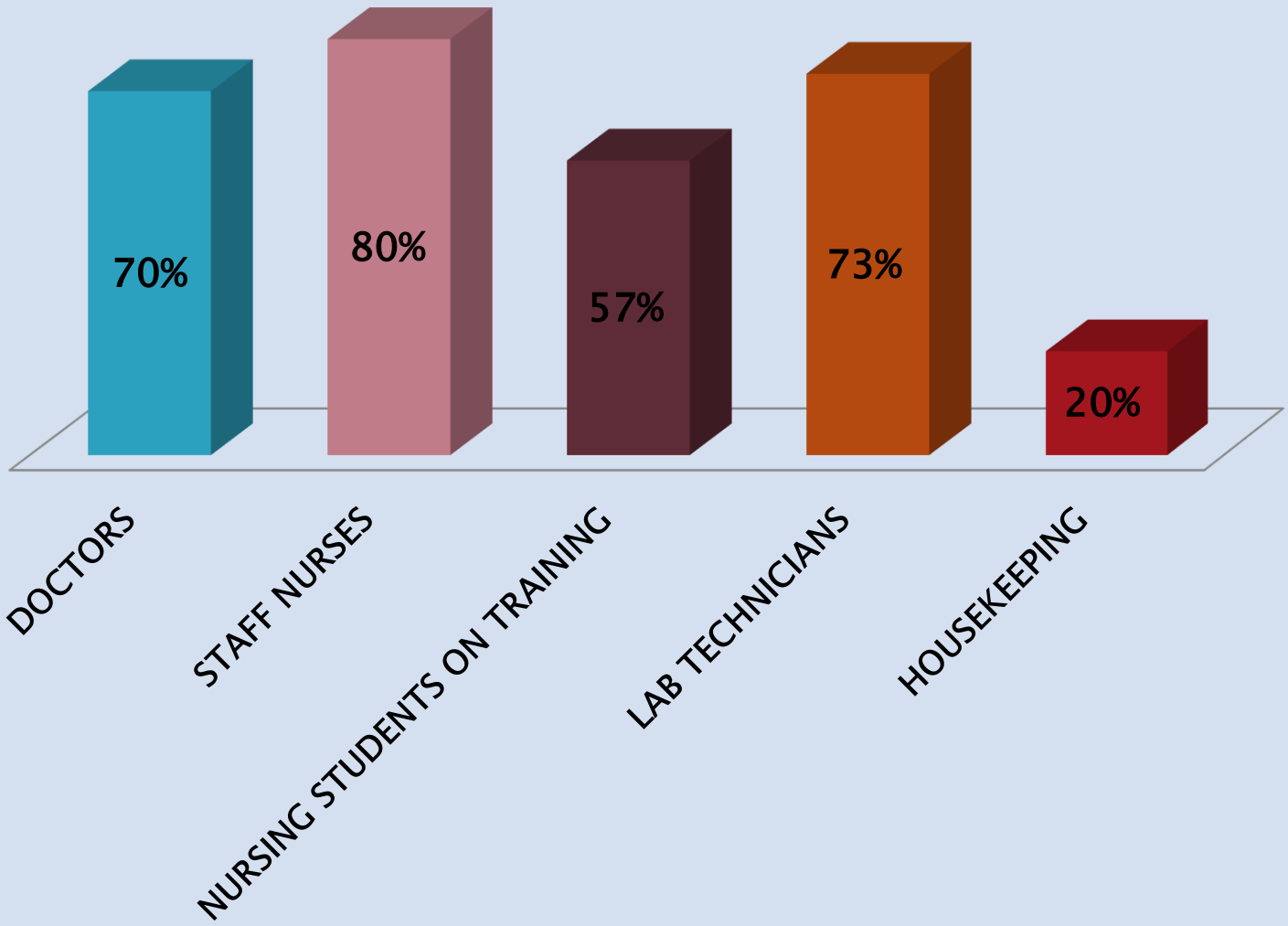
10 questions were included for this framework in the questionnaire, and the result was made with the assumption that those who answered 8 or more questions correct have good knowledge and awareness of bio medical waste management.

After the analysis of the data collected through questionnaires, the results showed that the 70% of the doctors had proper knowledge and awareness about bio medical waste management.

80% of the staff nurses had proper knowledge and awareness of bio medical waste management.

57% of the nursing students on training had proper knowledge and awareness of bio medical waste management.
73% of laboratory technicians had proper knowledge and awareness of bio medical waste management.
20% of the housekeeping staff had proper knowledge and awareness of bio medical waste management.

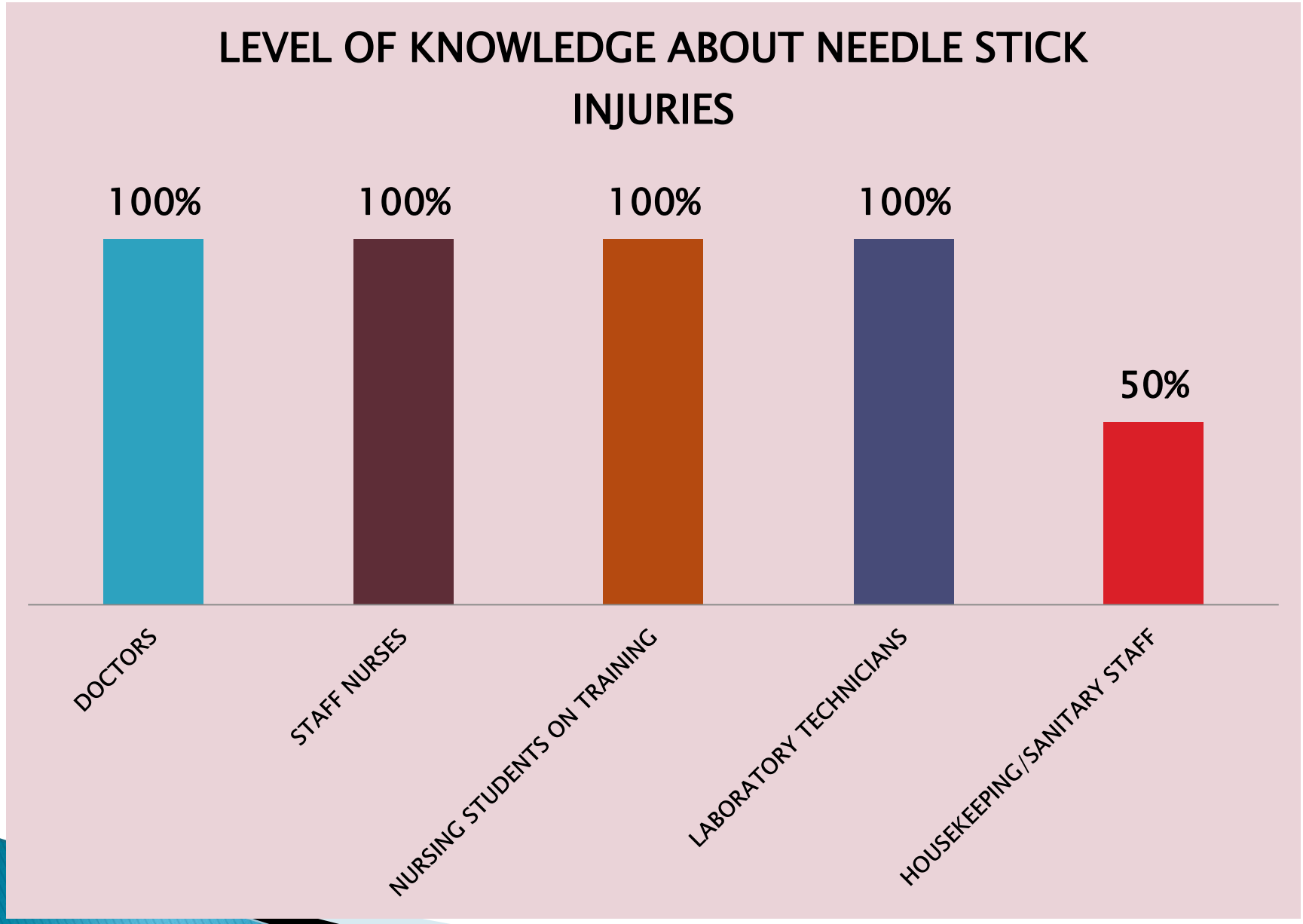
Knowledge and Awareness of Bio medical waste management



Level of knowledge among nurses, doctors, lab technicians and housekeeping on needle sticks injuries

5 questions were included for this framework in the questionnaire, and the result was made with assumption that those who answered 4 or more questions correct have proper knowledge on needle stick injuries.

After the analysis of the data collected through questionnaire, the results showed that 100% of doctors, 100% of staff nurses, 100% of nursing students on training, 100% of lab technicians and 60% of housekeeping staff had proper level of knowledge on needle stick injuries.


LEVEL OF KNOWLEDGE ABOUT NEEDLE STICK INJURIES
100%
100%
100%
100%
50%
DOCTORS
STAFF NURSES
NURSING STUDENTS ON TRAINING
LABORATORY TECHNICIANS
HOUSEKEEPING/SANITARY STAFF

OBSERVATION CHECKLIST to assess the current practices of bio medical waste management in the hospital

•Maintenance of records – **YES**

•Needle shredders are provided/present in each department –**YES**

•Color coded containers provided- **YES**

•Segregation properly done- **YES**

•Whether bio medical waste regularly lifted by common biomedical waste treatment facility (CBWTF)- **YES**

•Whether discarded medicines/expired medicines stored separately in yellow bag- **YES**

•Pre-treatment to Microbiology / Blood Bags etc. with autoclave –**YES**

•Final treatment to liquid waste –**NO**

•Non-chlorinated bags used- **YES**

•Whether final storage room/tank provided with Lock-key – **YES**

•Bar-code sticker pasted on color coded bag/container- **YES**

•Training to health-workers provided and record maintained- **YES**

•Immunization to health-workers provided – **doctors, staff nurses and lab technicians provided with the immunization except for few of the nursing students and no housekeeping staffs was immunized**.

•PPEs used by health workers during handling BMW- **YES**

•BMW Committee constituted in the hospital- **YES**

•CUTTING OF GLOVES BEFORE DISPOSING INTO COLOR CODED BINS- **NO**

Major Gaps observed after the comparison of the assessment of Current Practices of bio medical waste management and the observation checklist

•The HCF is cutting/shredding syringes to stop its reuse with needle shredder, however, in one of the ward it was observed that the needle shredder provided was unable to cut the needles.

•The hospital has not adopted the practice of cutting of gloves and glucose bottles before disposing in the color coded bins.

•The hospital has not provided arrangement for the treatment of liquid waste generated from operation theatre, labour room, dialysis section and laboratory. The entire quantity of liquid waste is being discharged into sewer without any treatment imparted to it.

•The hospital has not provided color coded bins at the final storage room.

Assessment of Infection Control practices among Doctors, staff nurses, nursing students on training, laboratory technicians and housekeeping/sanitary staff

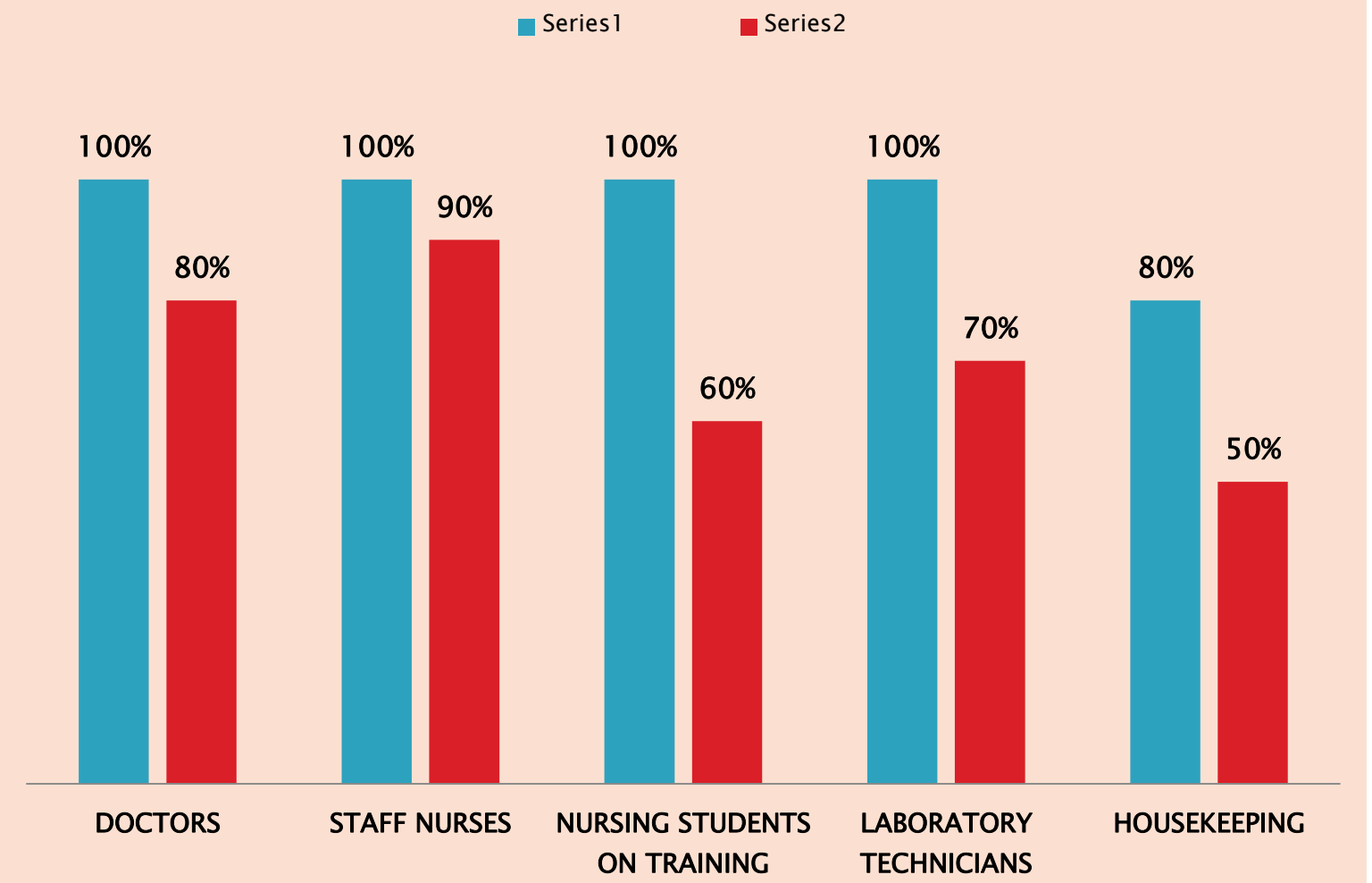
A questionnaire with 4 questions and observation checklist was made for the comparison.

After collecting the data the results showed-

•When the staffs was asked that is personal protective equipments important to be used, 100% of doctors, 100% of staff nurses, 100% of nursing students on training, 100% lab technicians answered it as yes and 80% of housekeeping staff/ sanitary staff answered it as yes.

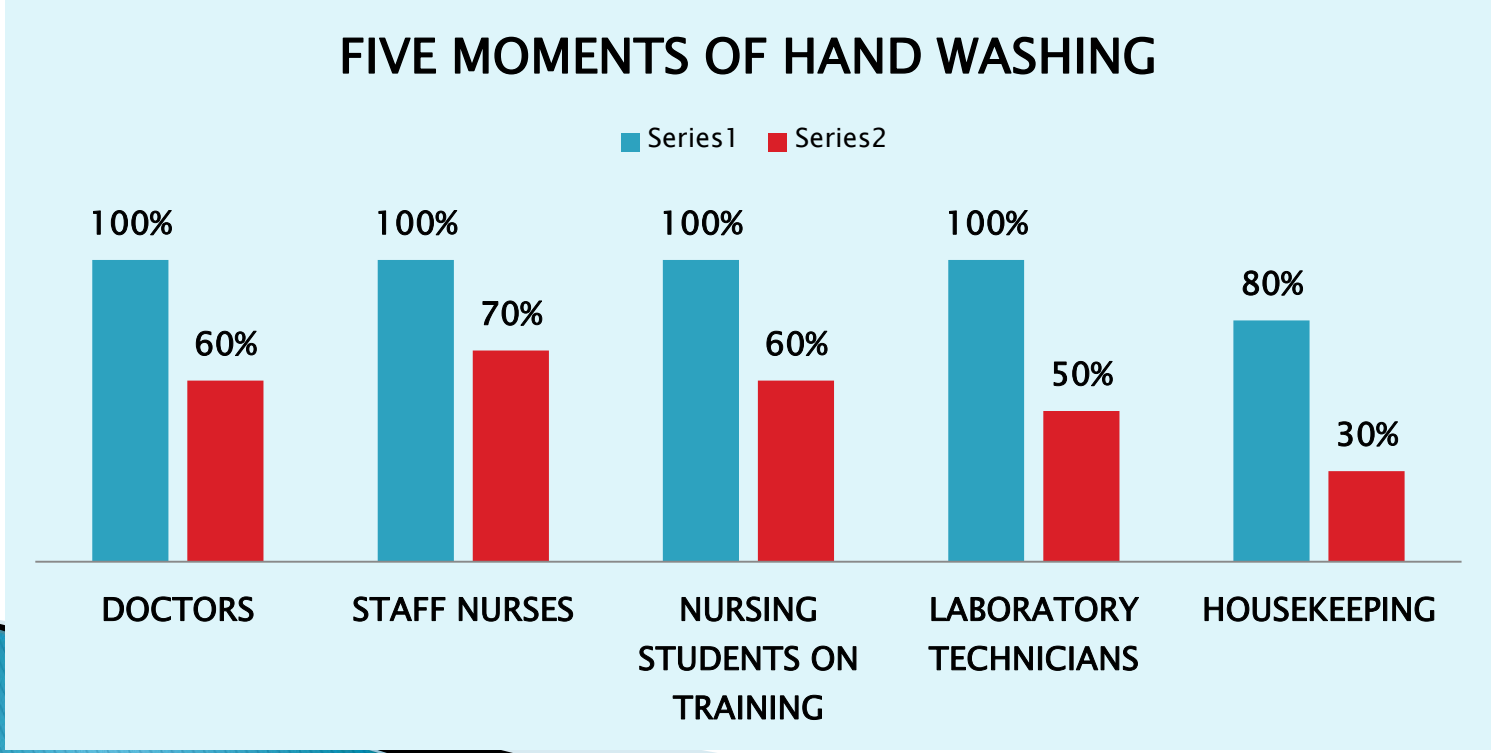
But on observation for the use of personal protective equipments the result was as follows-
80% of doctors, 90% of nurses, 60% of nursing students, 70% of lab technicians and 50% of housekeeping were actually using the personal protective equipments.

USE OF PERSONAL PROTECTIVE EQUIPMENTS



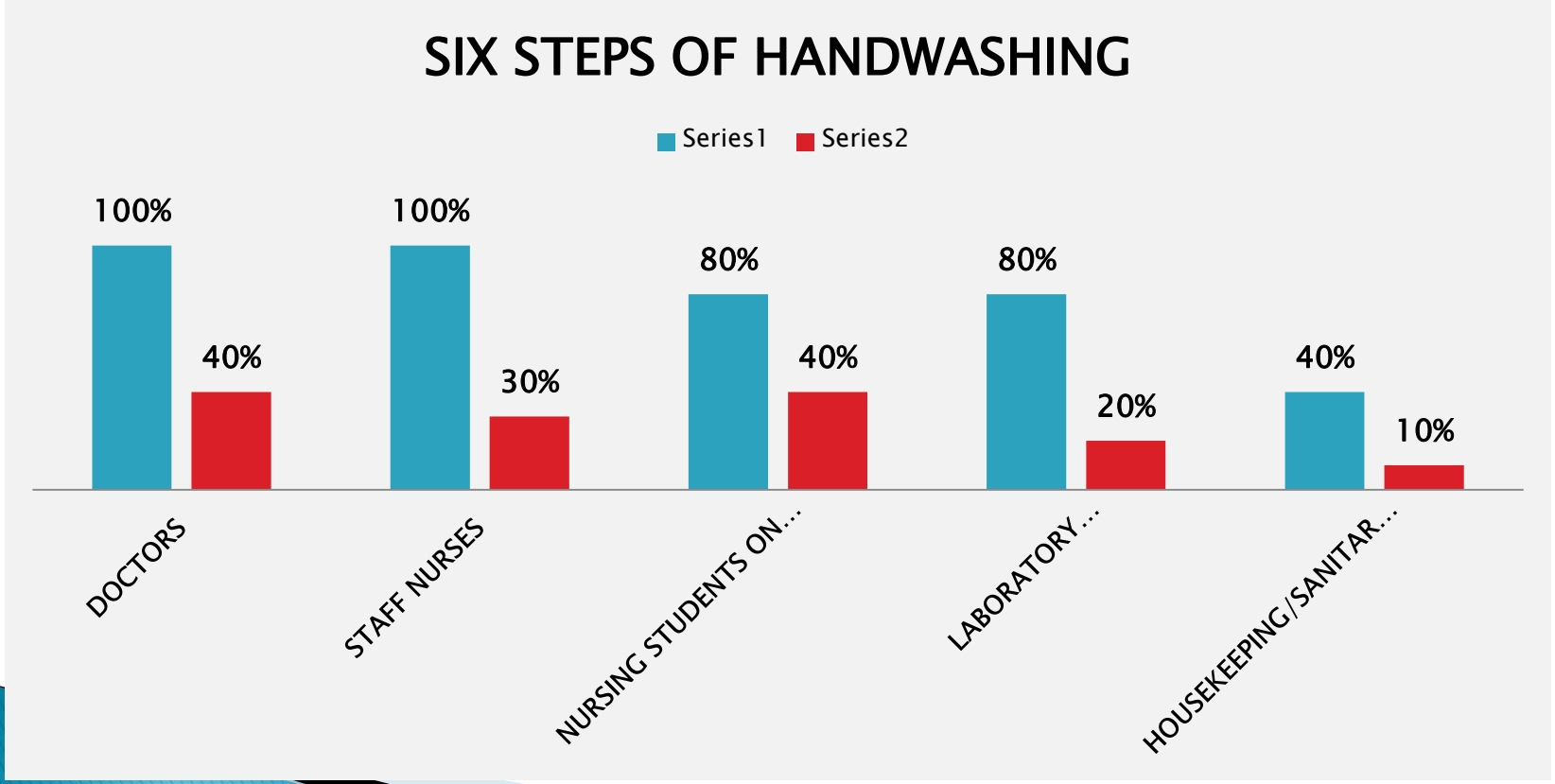
When the staff was asked that do you follow five moments of hand washing, 100% of doctors, 100% of staff nurses, 100% of nursing students, 100% of lab technicians and 60% of housekeeping staff answered yes.

But on observation,
60% of Doctors, 70% of Staff nurses,60% of nursing students for training, 50% of lab technicians and 30% of housekeeping/sanitary staff were actually following it.



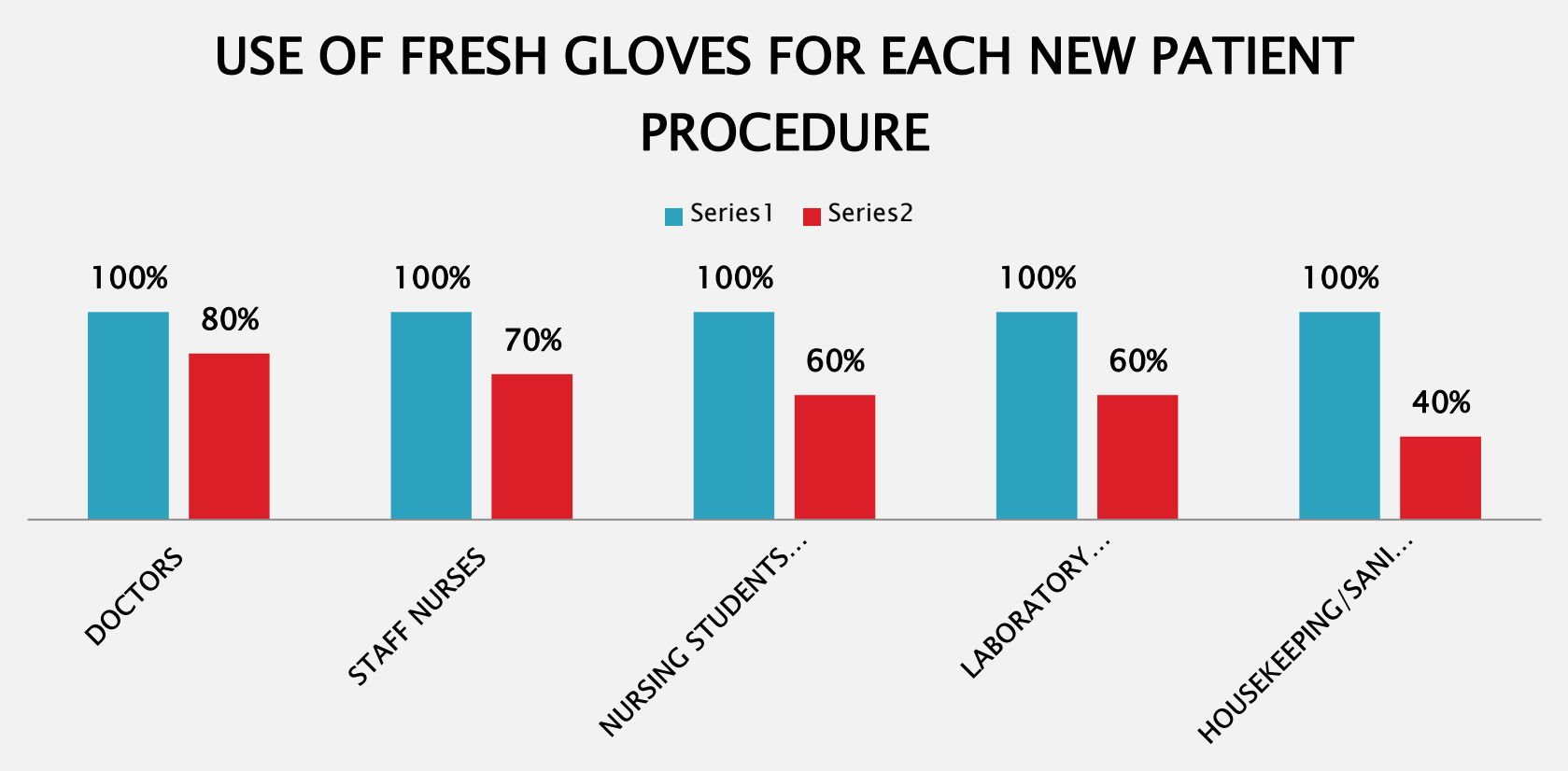
•When the staff was asked that do you follow six steps of Hand washing, 100% of the doctors, 100% of staff nurses, 80% of nursing students, 80% of laboratory technicians and 40% of housekeeping/ sanitary staff answered yes.

But on observation, only 40 doctors, 30% staff nurses, 40% nursing students, 20% lab technicians and 30% of sanitary staff were actually following it.



•When the staff was asked that is it important to use fresh gloves before every new patient procedure,
100% of doctors, 100% of staff nurses, 100% of nursing students, 100% of laboratory technicians and 100% sanitary staff answered yes.

But on observation, only 80% Doctors, 90% staff nurses, 80% nursing students, 70% lab technicians and 70% sanitary staff were actually following it.



CONCLUSION AND RECOMMENDATIONS

•A descriptive cross sectional hospital based study was conducted among 100 healthcare providers including Doctors, Staff Nurses, Nursing students on training, laboratory technicians and housekeeping/Sanitary staff.

•Nearly about all the participants have heard about Bio medical waste management and infection control measures. But there is lack of proper and complete knowledge about bio medical waste management practices.

•Doctors, nurses and laboratory technicians have better knowledge and awareness than the housekeeping/sanitary staff regarding BMW management.

•Regarding practices related to BMW management, Housekeeping staff were ignorant on many counts specially in regard to needle stick injuries.

• Also injury reporting was low across the housekeeping staff

- **After the assessment of infection control practices it was analysed that doctors, nurses and other health professionals were aware of all the infection control measures but on observation less number of staff were actually practising them.**

On comparing the Observation checklist and assessment of practices, it was analysed that the gloves and glucose bottles were not being cut before disposal and on observation again it was found that mainly the nursing student on training posted in different departments and wards were not cutting the gloves before disposal.

RECOMMENDATIONS-

The importance of training regarding biomedical waste management needs emphasis.
Regular monitoring is required at all levels specially for the nursing students on training and the housekeeping staff.
Enhancement should be done to the already existing infection control committee to supervise all the aspects of biomedical waste management.
Training on implementation of bio medical waste management and handling rules 2016 should be done as a refresher.


Thank
you