STUDY ON HOSPITAL INFECTION CONTROL-BASIC AWARENESS AND IMPLEMENTATION DONE IN SAKRA WORLD HOSPITAL, BANGALORE

Internship Training
at
Sakra World Hospital, Bangalore

By
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Under the guidance of
Dr. Santosh Kumar

MBA Hospital & Health Management
2013–15

Institute of Health Management Research
Jaipur
2015

INSTITUTE OF HEALTH
MANAGEMENT RESEARCH
(WHO Collaborating Centre for District Health System Based on Primary Health Care)

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that Dr.Anshu Malik has done the work on dissertation entitled "A Study on Hospital Infection Control- Basic Awareness And Implementation" under my personal guidance.

The candidate herself carried out all the investigations relating to the study.

Her approach to the study has been sincere ,scientific, and analytical. This work in partial fulfillment of the course requirements, is recommended for the award of the MBA in Hospital Management.

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This is to certify that **Dr. Anshu Malik**, student of PGDHM-18, Indian Institute of Health Management & Research, Jaipur has successfully completed her dissertation project on **"Hospital Infection Control - Basic Awareness and Implementation"** at Sakra World Hospital (A Unit of Takshasila Hospitals Operating Private Limited) from **2nd February 2015** to **30th April 2015,** under the supervision and guidance of the Medical Director.

During the dissertation, she was found to be sincere, dedicated and hardworking. She has also shown a great passion towards learning.

We wish her a successful career ahead.

For **Takshasila Hospitals Operating Pvt. Ltd**

S.V. Kiran

S V Kiran
Group Vice President – Human Resources

INSTITUTE OF HEALTH
MANAGEMENT RESEARCH
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CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **Hospital Infection Control-Implementation and Awareness** and submitted by **Dr. Anshu Malik** Enrollment No_**2013-15/1418** under the supervision of **Mr. Santosh Kumar** for award of MBA Hospital and Health Management of the university carried out during the period from **2013 to 2015** 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.

Anshu Malik

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Acknowledgement

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I would like to express my sincere thanks to **Dr. S.D. Gupta**, Director, IHMR, **Col. Dr. Ashok Kaushik**, **Dr Suresh Joshi, Mr.Santosh Kumar (mentor)** and all my faculty members for the proper guidance and cooperation extended by them. I am also grateful to my parents, my family and my friends for giving me moral support.

However, I accept the sole responsibility for any possible error of omission and would be extremely grateful to the readers of this project report if they bring such mistakes to my notice.

Dr.Anshu Malik

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Abstract

In the study it was found that staff had adequate knowledge regarding aseptic precautions such as hand hygiene but in practice they don't follow. This might be because of lack of practical training and inability to perform the work. Nursing staff are in close contact with the patient and they perform various duties like giving medicine, food, bedside procedure, etc. to patients. The knowledge has to be transformed into practice so that it gives effective result in health of the patient. There must be regular bed side training of nurses either by doctors, consultants, quality persons so that hospital achieves safe practice and proper patient care.

In relation with doctors it has been seen that doctors are doing their work effectively but there must be a proper mechanism so that suspected case of HAI is ruled out. HAI's have not been documented. All the suspected cases of HAI should be classified as catheter induced or caused by disease.

It has been seen that many times patients have plenty of pus cells in urinalysis and it has been not figured out whether its is due to catheter or due to the existing disease condition. Same is seen with CLABSI and VAP. Doctors should have a note of it in order to reduce the infection rate in hospital.

Success of a hospital depends upon the way they are able to reduce the infections which is usually under the control of the working staff. It will not only reduce the length of stay of patients but will also not put extra burden of cost on the patients

1.0 Introduction

Health care-associated infection (HCAI), also referred to as “nosocomial” or “hospital” infection, is defined as: “An infection occurring in a patient during the process of care in a health-care facility which was not present or incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge, and also occupational infections among staff.”

HCAI is acknowledged as the most frequent adverse event in health care, but the global burden remains unknown because of the difficulty of gathering reliable data.

1.1. Burden of HCAI worldwide

According to a literature review of national or multicentre studies published from 1995 to 2008, the overall prevalence of HCAI in developed countries varies between 5.1% and 11.6%.

While HCAI surveillance systems are in place at national/sub-national level in many developed countries, only 23 developing countries (23/147 [15.6%]) reported a functioning national surveillance system in a survey conducted by the WHO First Global Patient Safety Challenge. Therefore, very scanty data are available from the vast majority of low- and middle-income countries. Only nine published studies reported HCAI data at national level. Studies conducted in health-care settings in developing countries report hospital-wide HCAI rates markedly higher than those in developed countries.

The burden of HCAI is also much more severe in high-risk populations, such as adults housed in critical care and neonates, with overall infection rates and device-associated infection rates several-fold higher than in developed countries. The incidence of infection acquired in critical care in developing countries is at least twice that of the United States. In particular for some device associated infections (e.g., bloodstream infection and ventilator associated pneumonia), incidence densities can be up to 19 times higher than in developed countries.

1.2. Impact of HCAI

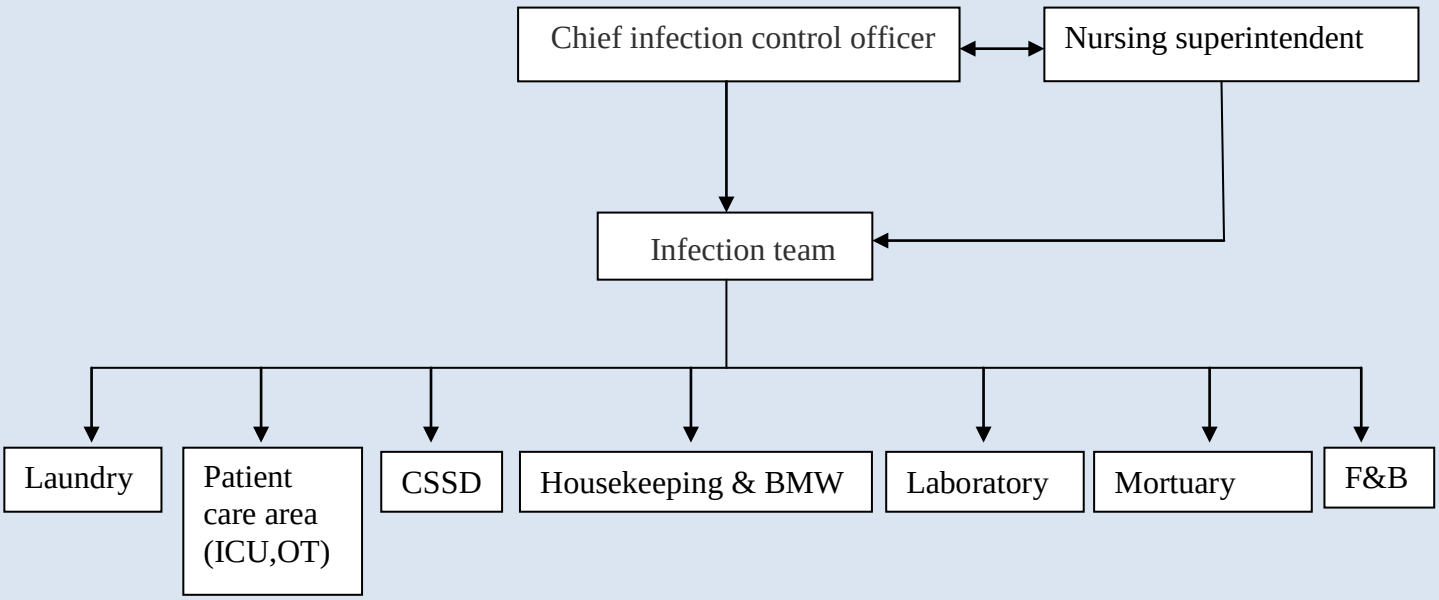
According to the available evidence, the impact of HCAI implies prolonged hospital stay, long-term disability, increased resistance of microorganisms to antimicrobials, massive additional financial burden for health systems, high costs for patients and their family, and unnecessary deaths.

Some infections, such as bloodstream infection and ventilator associated pneumonia, have a more severe impact than others in terms of mortality and extra costs. For instance, the mortality rate

Directly attributable to bloodstream infection in critically ill patients has been estimated to be 16–40% and the increase in length of stay between 7.5–25 days.

Very few studies from developing countries assessed HCAI impact and no report provided national estimates. Increased length of stay associated with HCAI varies between 6 and 23 days in non-critically ill patients. In developing countries, crude excess mortality in adult critically ill adults affected by ventilator-associated pneumonia is reported to be as high as 27.5%.

1.3.Organogram:



1.4.Objectives

- To assess the infection control measures obtained by hospital.

- To assess the knowledge regarding the infection control practices by medical and non – medical staff
- To assess the practical implementation of the infection control practices on the regular basis.
- To identify the training needs if any for the staff.

The areas covered for this project are as follows:

1. All ICUs (Medical, Surgical, Cardiac,Neuro)
2. Wards (general , private, semi-private, deluxe)
3. Kitchen
4. Laundry
5. CSSD
6. Housekeeping
7. BMW(Biomedical Waste)

2.0.METHODOLGY:

This is a cross sectional type of study(carried in a particular time period).All of the important treating hospital is covered along with the support services like CSSD,laundry ,kitchen etc.

2.1.Study Type

Cross-sectional study.

2.2Study Area

ICUs (Medical, Surgical, Cardiac),Wards (general ,private, semi-private, super deluxe), Kitchen, Laundry, CSSD

2.3.Sampling method

Convenient sampling method

2.4.Study Participants:

Staff of the respective departments and nursing staff.

2.5.Sample size

54 nursing staff directly involved with the patient care.

2.6.Study Technique

Interview, checklist.

2.7.Study Tool

Structured questionnaire, Checklist.

2.8.Data Collection Plan – This study surveyed 54 nursing staff. For collecting the data interviews and observation of the staffs of all departments and concerned areas was carried out after taking authorization from concerned authorities of these departments.

The procedure followed is enumerated below:

I) A study of the duties of each individual was conducted to understand the roles and responsibilities of the medical and non-medical staff working in patient care areas.

II)Nursing and non- medical staff in each department were interviewed in detail to know about the infection control measures carried out by them, in addition observation of the staff while working in the department was also done.

i. Structured checklists were prepared by referring to the NABH guidelines textbook and internet for the respective departments, which is given in the annexure.

ii. In addition a general questionnaire was also prepared for observation regarding clinical procedures like hand hygiene, injection infusion, and transmission precautions.

2.9.Data analysis

Done with the aid of MS-Excel sheets. The data was entered in sheets department wise and then analyzed with the help of graphs.

2.10.Ethical Considerations- purpose of the study was clearly explained. The respondents were assured of the data confidentiality.

3.0.Data Analysis

The department wise analysis of the data is as follows:

3.1.Essential standard precaution-

Standard precaution should be considered minimum requirements for infection control. Implementing standard precaution minimizes the risk of transmission of infection from person to person even in high –risk situation. All important components like hand hygiene ,safe infection and infusion process ,CAUTI, and central line infection.
3.1.1 Hand hygiene
3.1.2 Safe infection and infusion process
3.1.3.Transmission –based precaution
3.1.4.CAUTI(catheter associated urinary tract infection)
3.1.5.Central line infection.

3.2. Support services-support services are departments within our hospital which carry out much of the "behind the scenes" work .They help to support the work carried out by our frontline departments but are just as crucial. Support services includes CSSD ,housekeeping ,kitchen ,security etc. This study includes six important support services .

3.2.1.CSSD
3.2.2.Housekeeping
3.2.3.Kitchen
3.2.4.Laundry
3.2.5.OT
3.2.6.Biomedical waste management

3.1 Essential standard precautions

3.1.1 Hand hygiene

Any healthcare workers, caregiver or person involved in direct or indirect patient care needs to be concerned about hand hygiene and should be able to perform it correctly and at the right time(WHO)

- Availability of alcohol-based hand rub-

A alcohol based hand rub kills 99.99% of microbes within 30 sec, and is provided at point of contact so that health care providers disinfect their hand before and after touching patient.

Point of care: The place where three elements come together: the patient, the health-care worker, and care or treatment involving contact with the patient or his/her surroundings (within the patient zone). Point-of-care products should be accessible without having to leave the patient zone (ideally within arm's reach of the health care worker or within 2 meters)
100% Available facility-wide with continuous supply and also at the point of care3 in the majority of wards.

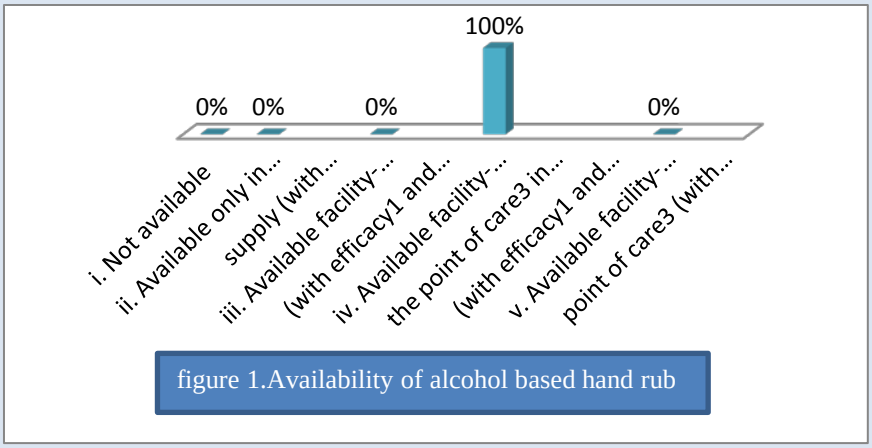


figure 1.Availability of alcohol based hand rub

- Sink: bed ratio-

Sink is provided to wash the hand with help of soap and water so number of sinks to bed ratio is to be maintained to 1:10 as per CDC guidelines to reduce the fatigue and increase the use of the sink.

In Sakra world hospital 1:10 ratio is there in all ICU (micu, sicu, ccu) and but not in general wards and semiprivate and private wards.
1:1 ratio in isolation rooms.

- Water supply-

Water is required to wash the hand with soap ,so continuous supply of water is one of the important factor to be taken care of.
In this hospital there is continuous, clean running water in all patient care areas.

- Soap-

A good quality soap is required to disinfect the hands for prevention of cross infections in hospitals.

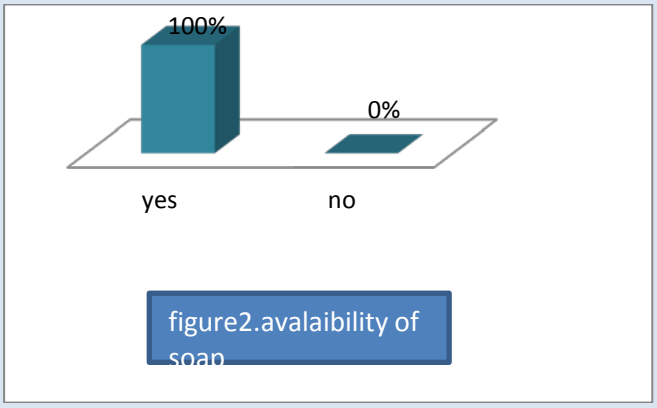


figure2.avalaibility of soap

Soap is available in all sinks of patient care area (ICU, wards)

- Single-use towels/Tissue paper –

Drying is one of the important part of hand hygiene traditionally towels were being for this purpose but availability of clean towels on timely basis was a problem so to overcome this problem in Sakra Hospital Tissue paper are being used.

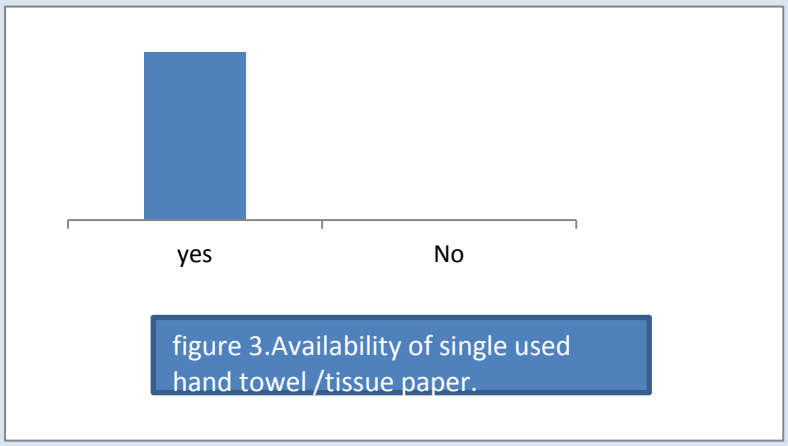


figure 3.Availability of single used hand towel /tissue paper.

- Training regarding hand hygiene-

Training at the time of joining as well as regular training is important to make the staff learn and practice .

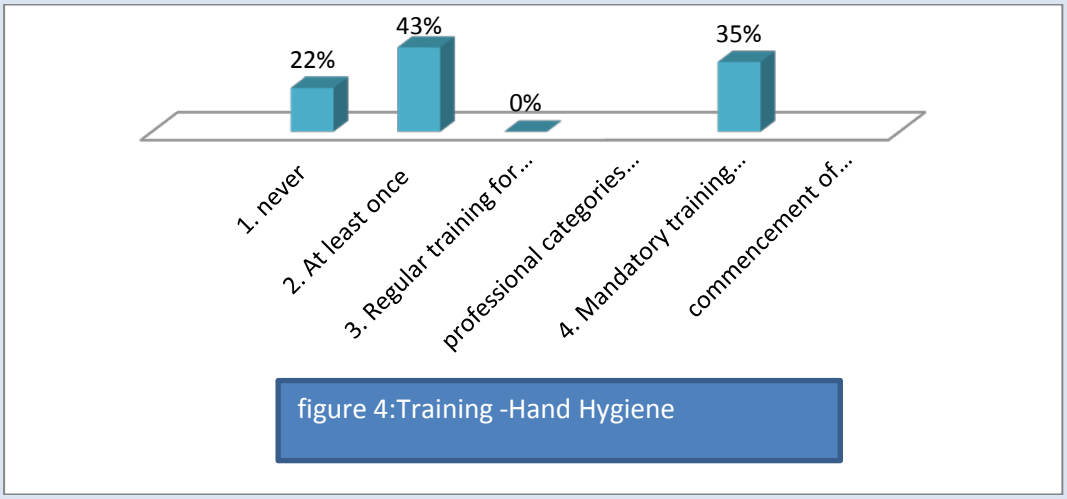


figure 4:Training -Hand Hygiene

Out of 54 people,

Never – 22%

At least once-43%

Mandatory training for all professional categories at commencement of employment, then ongoing regular training (at least annually) - 35%

Regular training for medical and nursing staff, or all professional categories (At least annually)- 0%

- <u>System in place to ensure that all health-care workers complete this training</u>

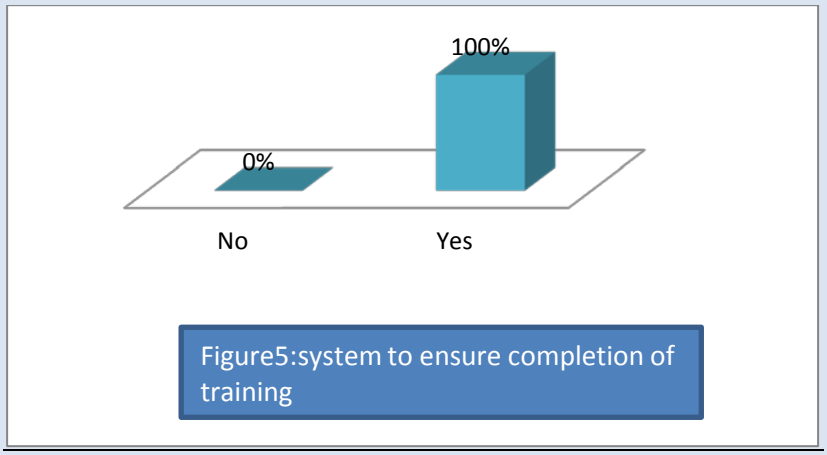


Figure5:system to ensure completion of training

100% of health care workers informed that there is a training need assessment sheet that is filled by the department mentioning the name of the people who have undergone training and it is submitted in HR dept.

Also there is a test conducted post training to ensure that trainee is trained or not.

- Professional with adequate skills to serve as trainer for hand hygiene educational programs

Professional staff should be there to provide the training to the staff.

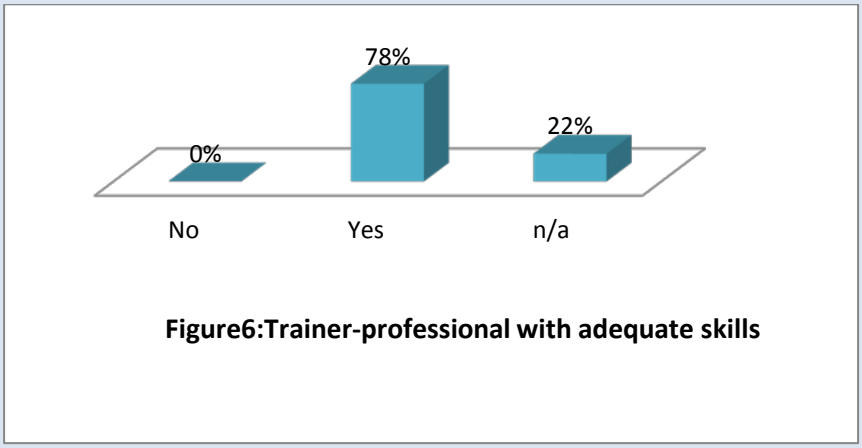


Figure6:Trainer-professional with adequate skills

Out of 54 persons,

78% informed that there are professionals to provide them training.

22% were not applicable – those who have not gone under training.

- Health-care worker knowledge regarding indications and technique for hand hygiene assessed at least annually

Regular assessment should be carried out to identify the training of the staff .For that test, random interviews should be carried out.

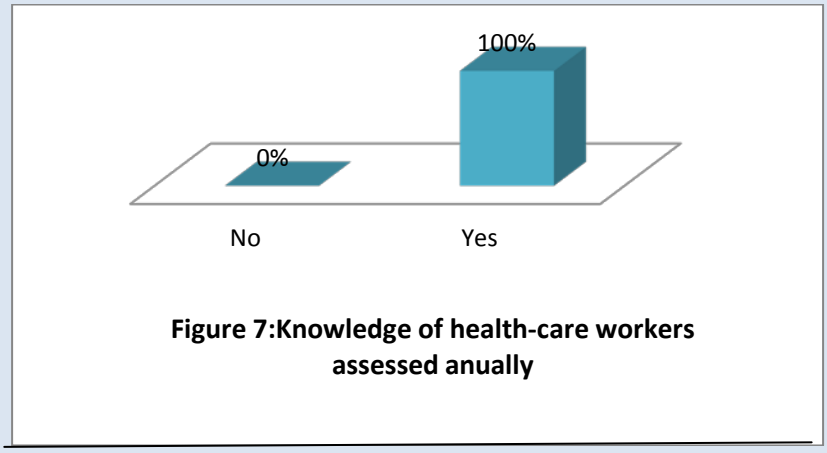
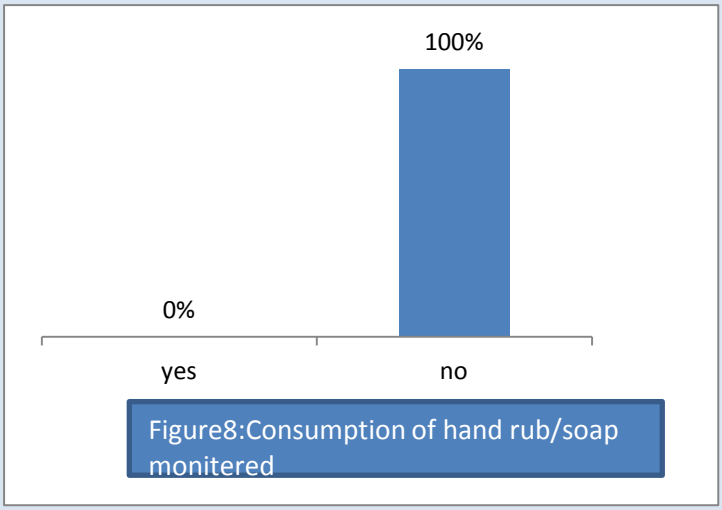


Figure 7:Knowledge of health-care workers assessed anually

100% of staff (i.e. interviewed) undergoes an assessment annually by appearing for a written examination which is also submitted to HR dept to test effectiveness.
And regular observation by HIC team assures practical knowledge

- Consumption of alcohol-based hand rub and soap monitored monthly (or at least every 3-5 month



There is no monitoring of consumption of soap and alcohol – based hand rub but this should to reviewed regularly so that we can identify the area in which these things are consumed less than normal limit (Faults in practice) or more consumption is there(wastage).

INDICATIONS OF HAND HYGIENE-

- Before handling medication or preparing food-

To prevent cross infection in hospital washing of hands before giving medicines or food to the patients is mandatory.

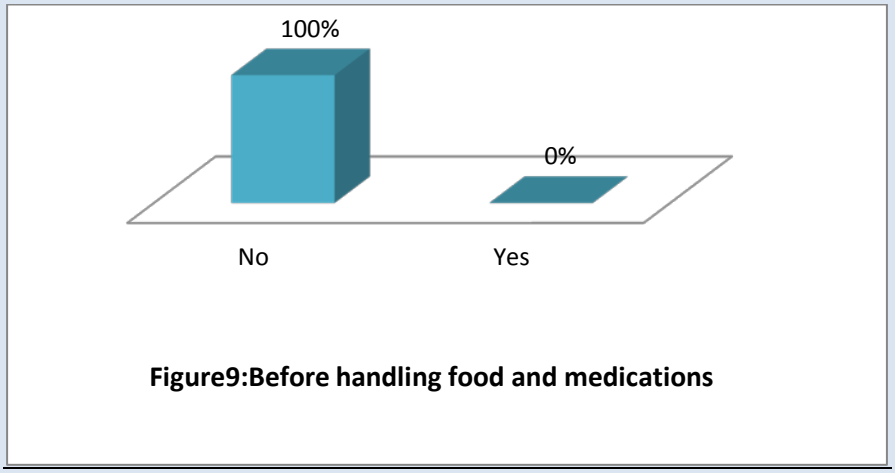


Figure9:Before handling food and medications

- Wash hands when visibly dirty or visibly soiled with blood or other body fluids or after using the toilet-

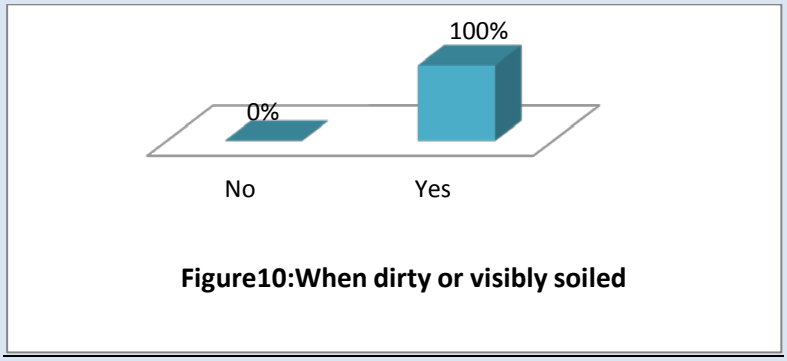


Figure10:When dirty or visibly soiled

- Before and after touching the patient-

  In hospitals every patient carry a different kind of infection and immunity of the most patient is also reduced so to prevent hospital acquired infection health care providers should disinfect their hand before and after touching each and every patient.

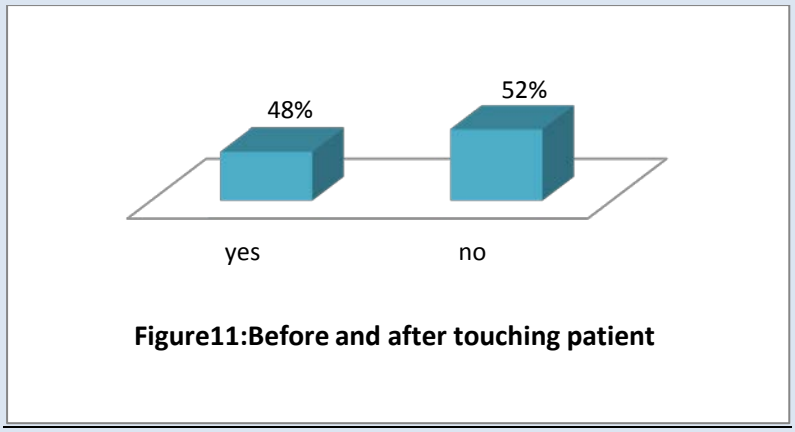


Figure11:Before and after touching patient

52%staff does not perform hand hygiene both before and after touching patient

48% perform either before or after touching patient.

- Before handling an invasive device for patient care, regardless of whether or not gloves are used

  Before handling any invasive process hand hygiene is a mandatory as hand comes in direct contact with blood and other body fluids.

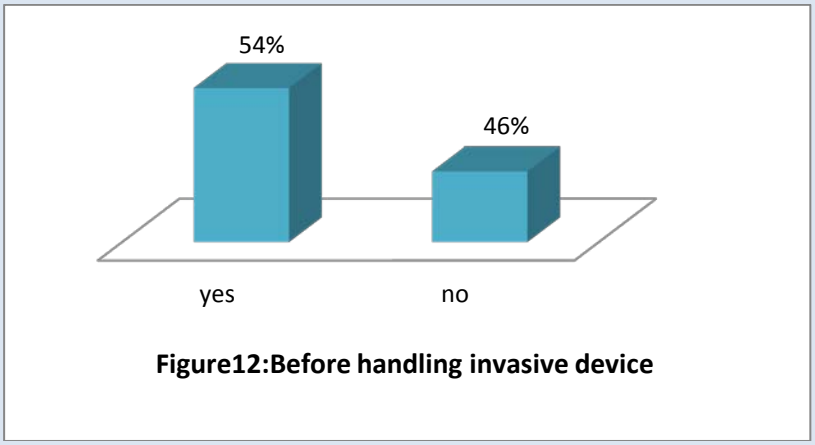


Figure12:Before handling invasive device

54% of staff performs hand hygiene before handling invasive device.

46% of staff does not perform hand hygiene before handling invasive device.

- After contact with body fluids or excretions, mucous membranes, non-intact skin, or wound dressings

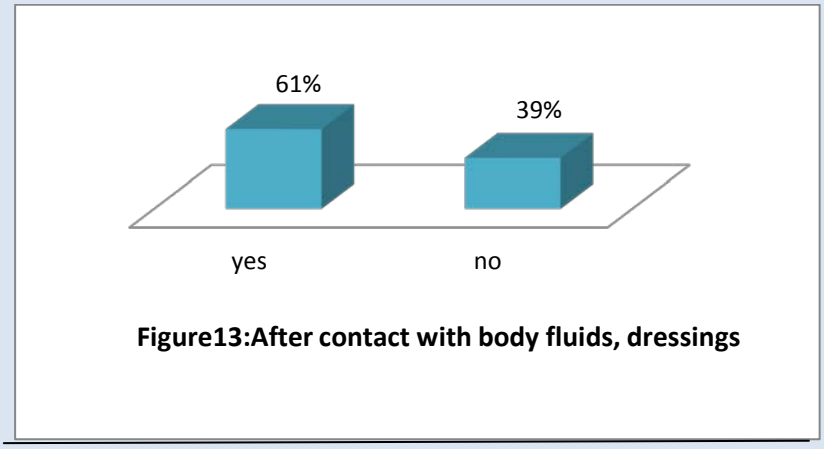


Figure13:After contact with body fluids, dressings

61% perform hand hygiene after contact with body fluids or excretions, mucous membranes, non-intact skin, or wound dressings.

39% do not perform hand hygiene after contact with body fluids or excretions, mucous membranes, non-intact skin, or wound dressings.

- <u>If moving from a contaminated body site to another body site during care of the same patient</u>

  Care should be taken to prevent spread of infection from one part of the to other part .

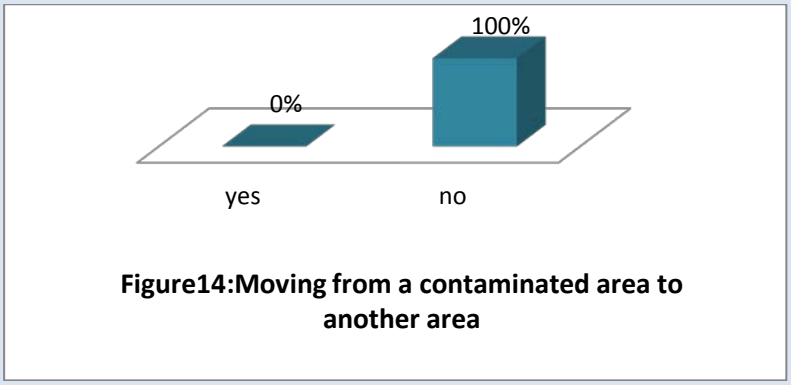


Figure14:Moving from a contaminated area to another area

- <u>After contact with inanimate surfaces and objects (including medical equipment) in the immediate vicinity of the patient-</u>

  Hand hygiene should be carried after touching any inanimate object as these are the source of infection .

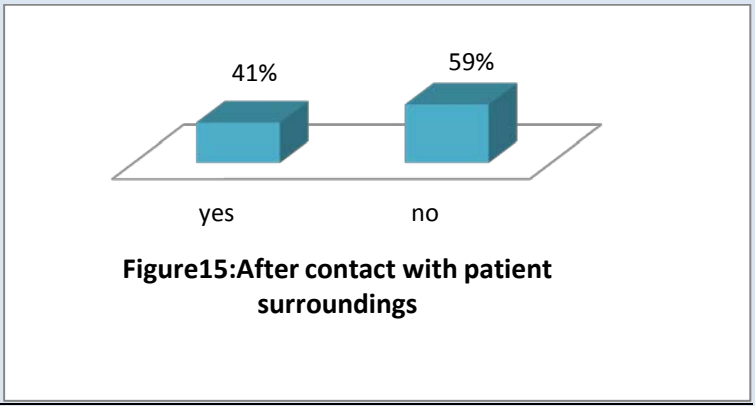


Figure15:After contact with patient surroundings

41% staffs perform hand hygiene after contact with inanimate surfaces and objects (including medical equipment) in the immediate vicinity of the patient.

59% staffs do not perform hand hygiene after contact with inanimate surfaces and objects

(Including medical equipment) in the immediate vicinity of the patient.

- After removing sterile or non-sterile gloves-

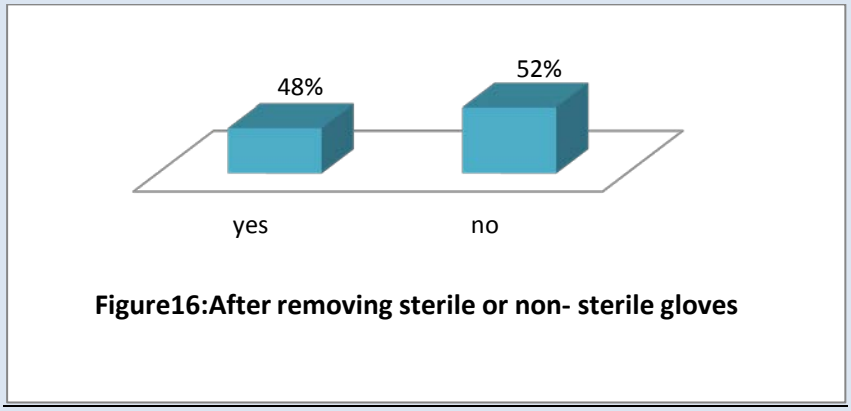


Figure16:After removing sterile or non- sterile gloves

48% staff performs hand hygiene after removing sterile or non-sterile gloves.

52% staff does not perform hygiene after removing sterile or non-sterile gloves.

- Before leaving the patient care area-

After leaving patient site hand should be sterilized .

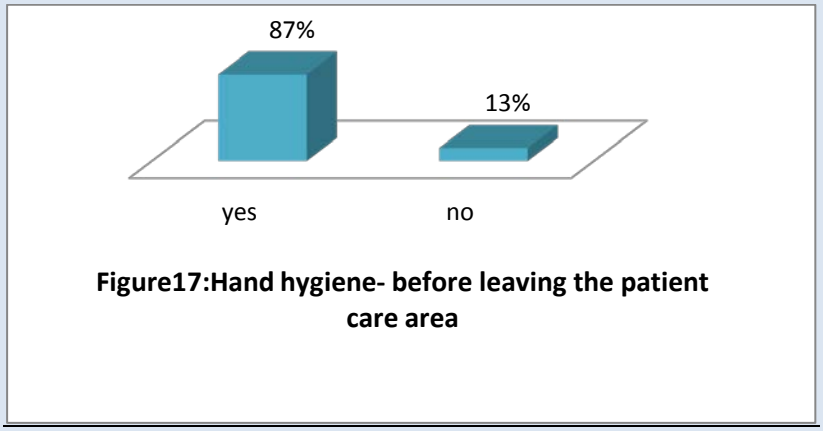


Figure17:Hand hygiene- before leaving the patient care area

87% staff performs hand hygiene before leaving the patient care area.

13% staff does not perform hand hygiene before leaving the patient care area.

USE OF GLOVES:-

- Wear gloves when it can be reasonably anticipated that contact with blood or other potentially infectious materials, mucous membranes or non-intact skin will occur-

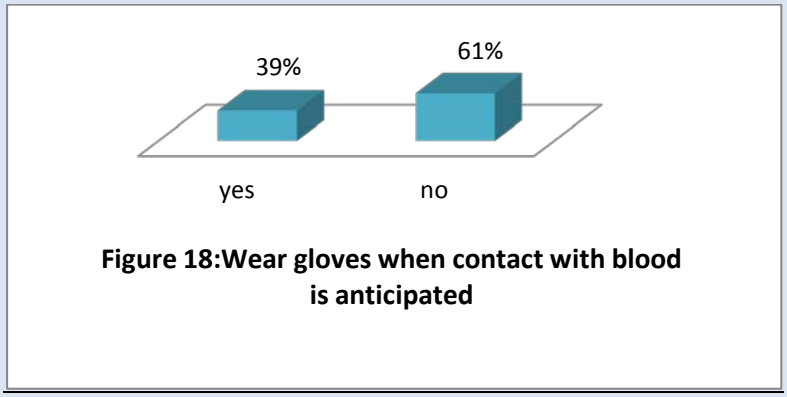


Figure 18:Wear gloves when contact with blood is anticipated

- Remove gloves after caring for a patient. Do not wear the same pair of gloves for the care of more than one patient-

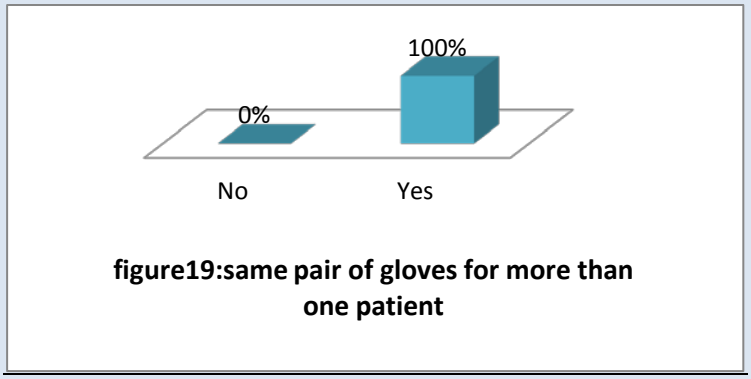


figure19:same pair of gloves for more than one patient

100% staff removes gloves after use and do not wear same for other patient.

- When wearing gloves, change or remove gloves during patient care if moving from a contaminated body site to either another body site within the same patient or the environment-

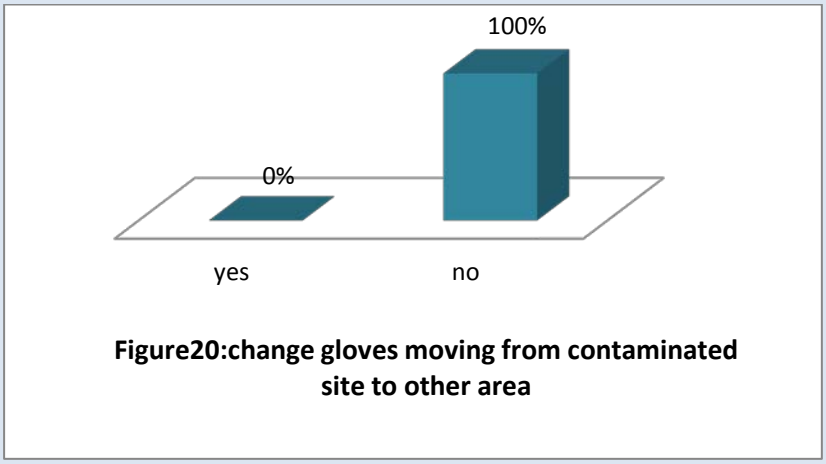


Figure20:change gloves moving from contaminated site to other area

100% staff does not follow and thus do not change or remove gloves when moving from a contaminated body site to another body site of same patient.

- Hand Hygiene Technique with Alcohol-Based Formulation-

100% staff follows the standard timing of hand rub that is 20-30 secs which is important to make hand germ free.

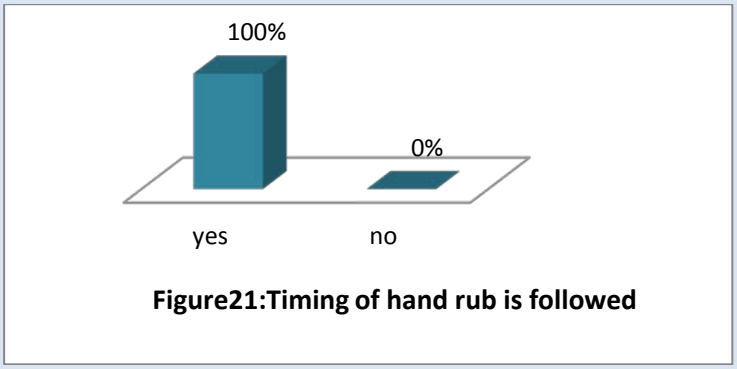


Figure21:Timing of hand rub is followed

- Hand Hygiene Technique with Soap and Water-

100% staff follows the standard timing of hand rub that is 40-60 secs.

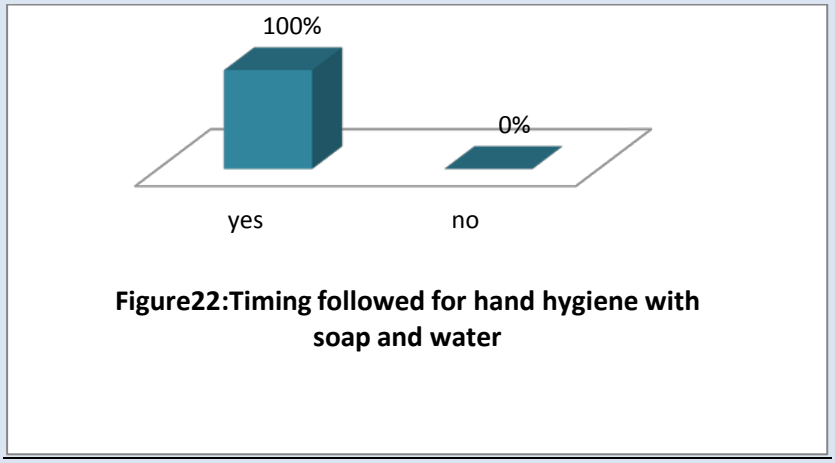


Figure22:Timing followed for hand hygiene with soap and water

3.1.2.SAFE INJECTION AND INFUSION PROCESS

Safe injection and infusion process

- Needles and syringes are used for only one patient-

  Disposable needles are used for each patient.

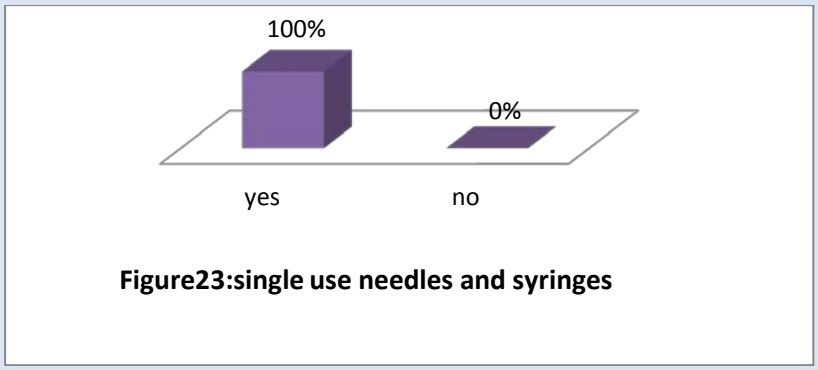


Figure23:single use needles and syringes

(To avoid transfer of infection and diseases)

- Rubber septum on a medication vial-

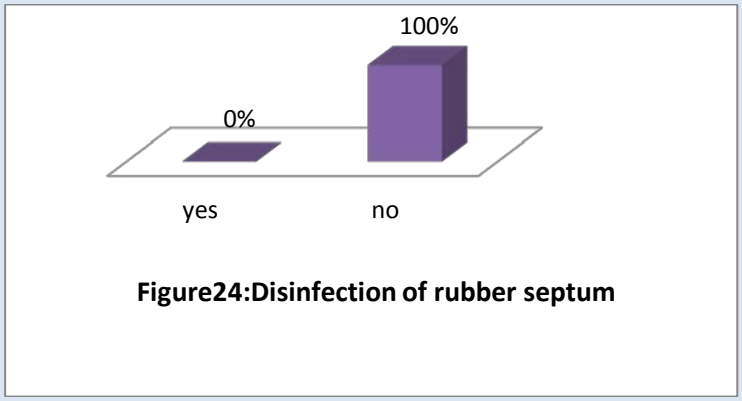


Figure24:Disinfection of rubber septum

Rubber septum on a medication vial is not disinfected with alcohol prior to piercing

Purpose- the infection from the surface is not transferred.

Medication vials-

Medication vials are entered with new needle and a new syringe, even when obtaining additional doses for the same patient.

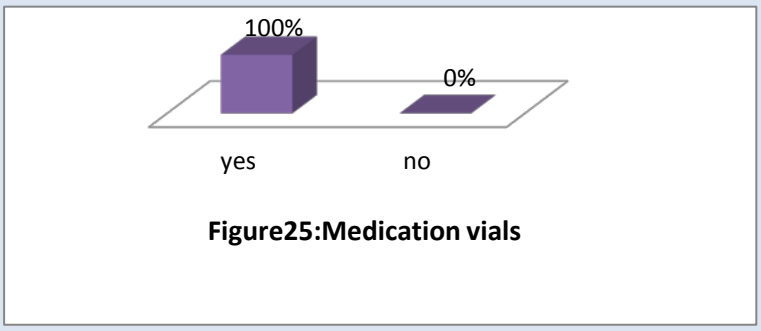


Figure25:Medication vials

- Medication vials, ampoules, and bags or bottles of IV solutions-

Single use medication vials, ampoules, and bags or bottles of IV solutions are used for only one patient

100% followed

They are then disposed according to the BMW- in white containers and red respectively.

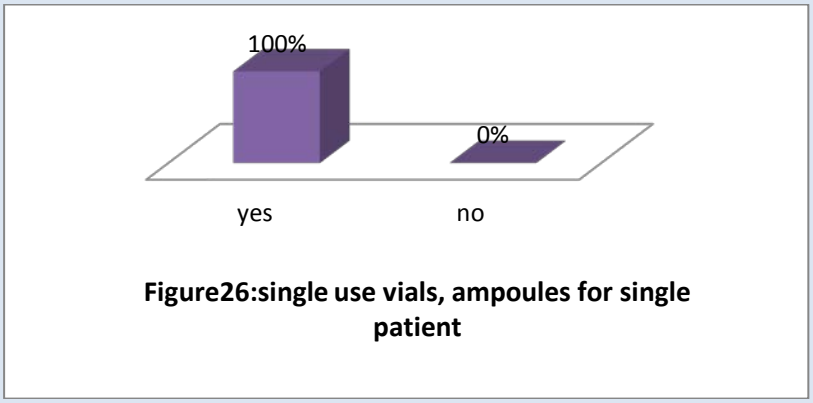


Figure26:single use vials, ampoules for single patient

- Medication administration tubing and connectors-

  Medication administration tubing and connectors are used for only one patient

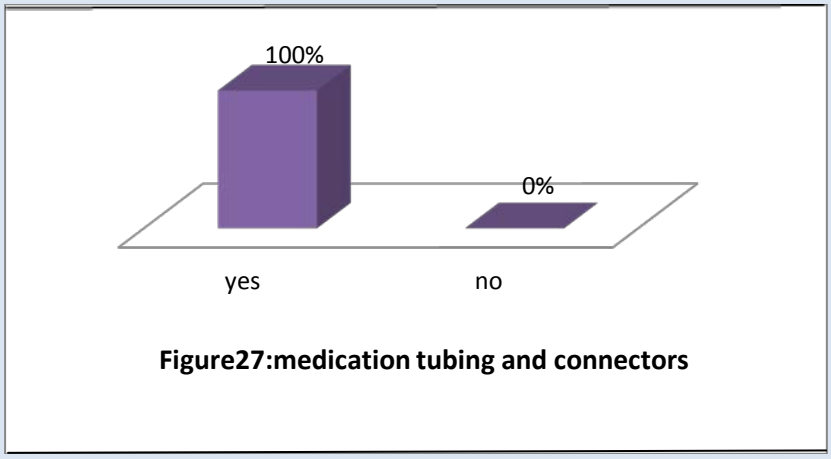


Figure27:medication tubing and connectors

- Disposal of sharps-

Not all sharps are disposed off in a puncture - resistant sharp container

There is availability of white containers in all wards and ICUs to dispose sharps.

78% is followed

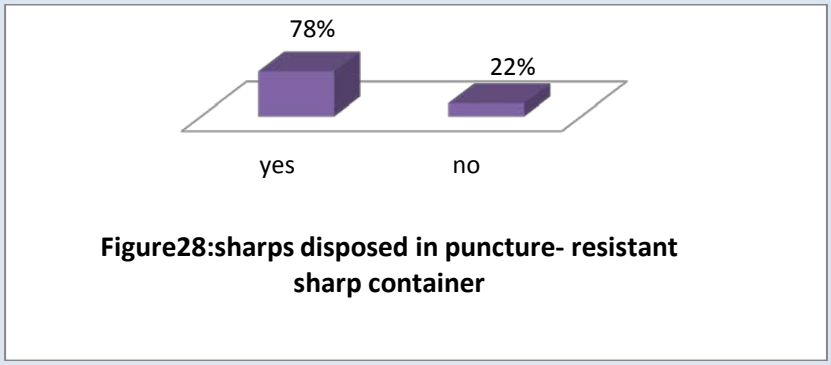


Figure28:sharps disposed in puncture- resistant sharp container

- Single - use devices-

Single - use devices are discarded after use and not used for more than one patient

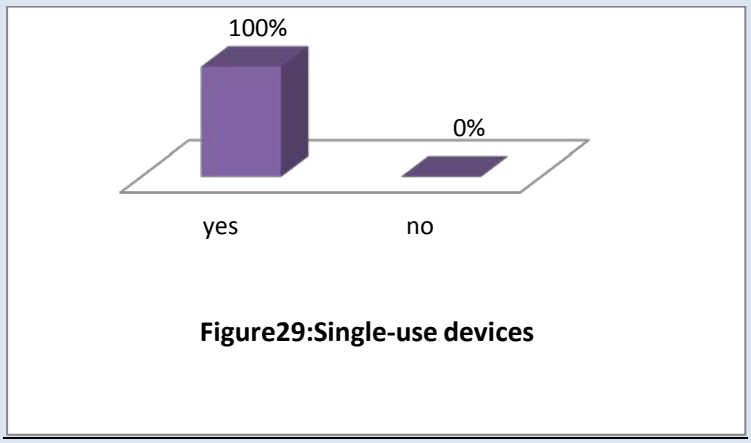


Figure29:Single-use devices

- Protocols for needle stick injury-

Protocols of needle stick injuries are as follows :
Effected part should be washed under running water with soap and water and at the same time this should be informed to your departmental HOD .Blood test like HIV and Hepatitis B are carried out for free twice.

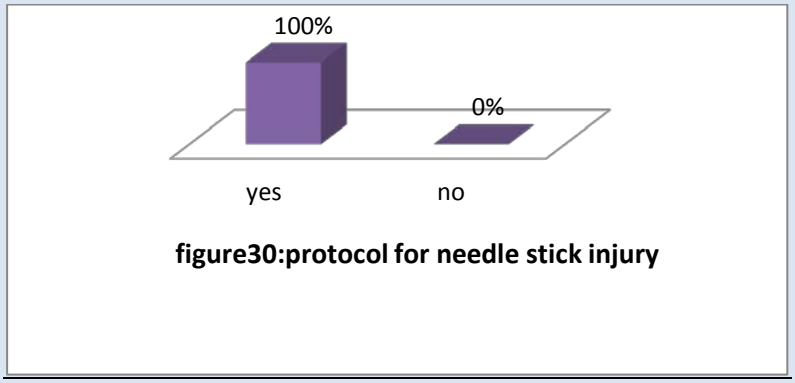


figure30:protocol for needle stick injury

100% staff is aware of needle stick injury protocol and is followed, and even the posters are displayed in few patient care areas.

But the reporting is not done by the staff, when checked there were only 1-2 reporting every month in last few months.

3.1.3.TRANSMISSION – BASED PRECAUTIONS

(According to CDC)

Potentially infectious patient

CONTACT, DROPLET AND AIR BORNE PRECAUTIONS

- Wear gloves when touching the patient and the patient's immediate environment or belongings-

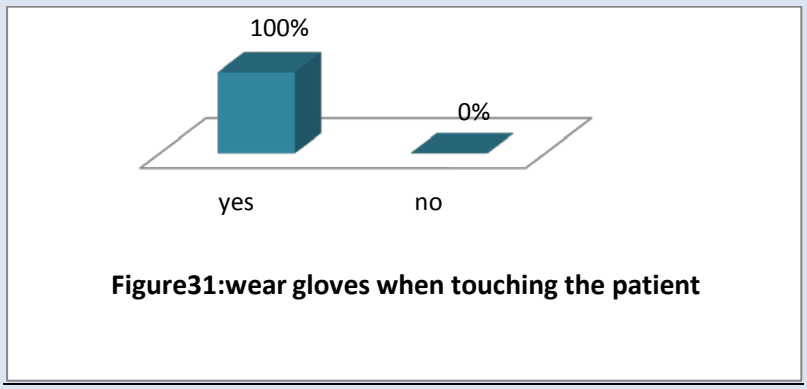


Figure31:wear gloves when touching the patient

- Wear a gown if substantial contact with the patient or their environment is anticipated-

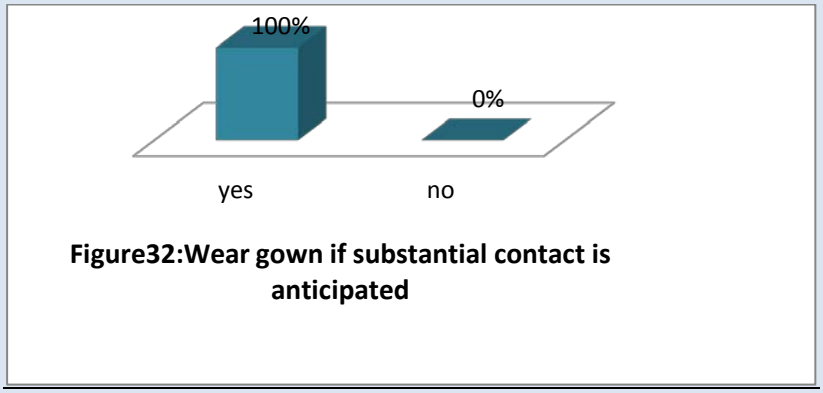


Figure32:Wear gown if substantial contact is anticipated

- Perform hand hygiene before touching patient and prior to wearing gloves-

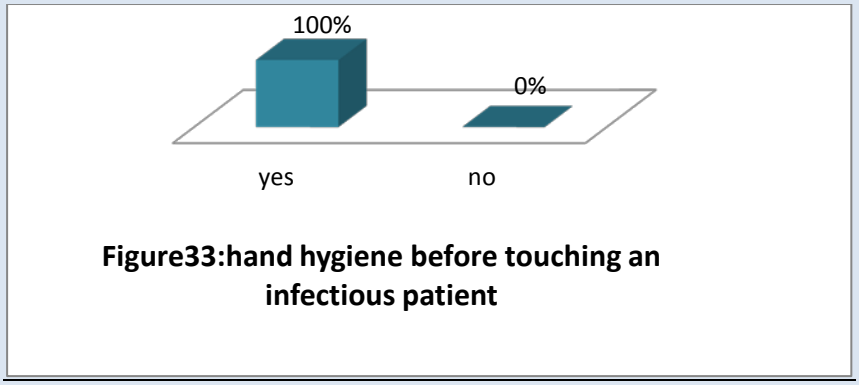


Figure33:hand hygiene before touching an infectious patient

100% staff is aware that they have to perform hand hygiene before touching an infectious patient.

- Perform hand hygiene after removal of PPE; note: use soap and water when hands are visibly soiled-

PPE means personal protective equipments i.e head caps ,gloves and mouthmasks.

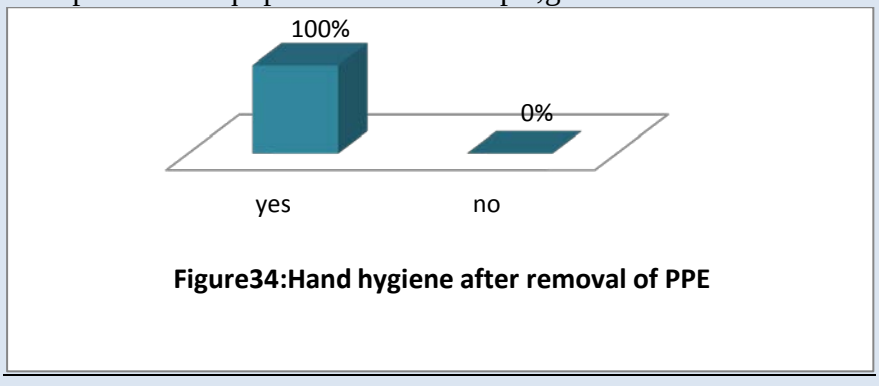


Figure34:Hand hygiene after removal of PPE

100% staff is aware that they have to perform hand hygiene after removal of PPE.

- Perform hand hygiene before touching patient and prior to wearing gloves-

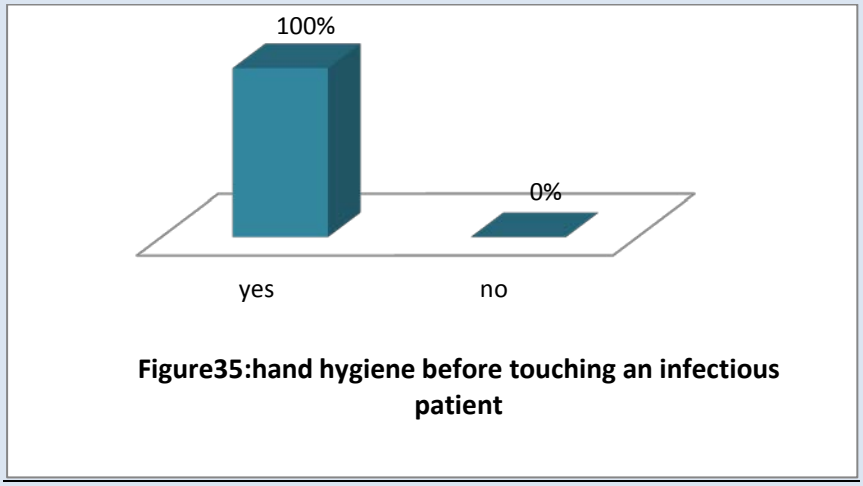


Figure35:hand hygiene before touching an infectious patient

100% staff is aware that they have to perform hand hygiene before touching an infectious patient.

- Perform hand hygiene after removal of PPE; note: use soap and water when hands are visibly soiled-

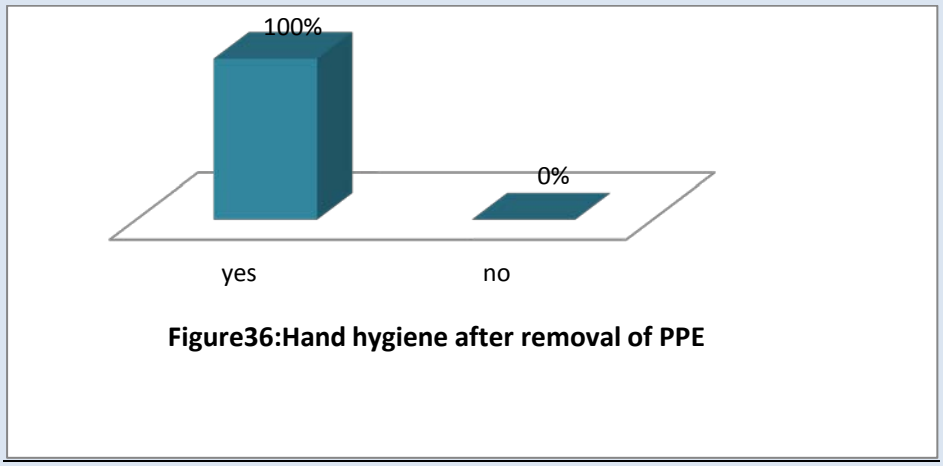


Figure36:Hand hygiene after removal of PPE

100% staff is aware that they have to perform hand hygiene after removal of PPE.

- Clean/disinfect the room accordingly-

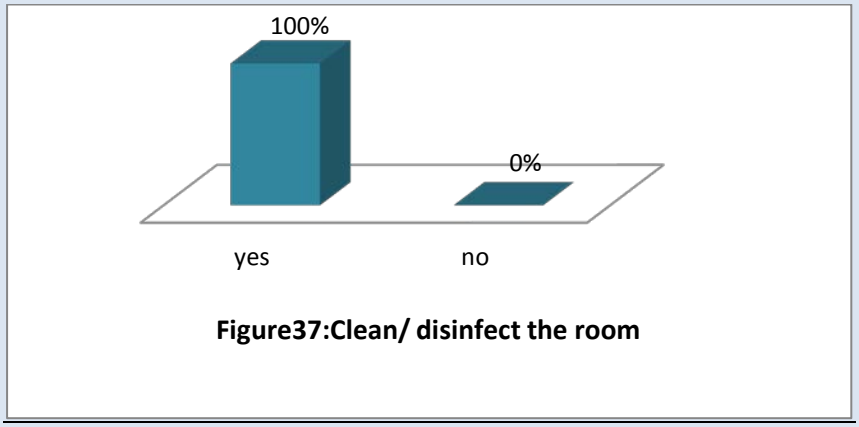


Figure37:Clean/ disinfect the room

100% staff is aware that the room is deep cleaned or fumigated after the patient is discharged.

- PPE use-

  Surgical facemask, gloves and gown-

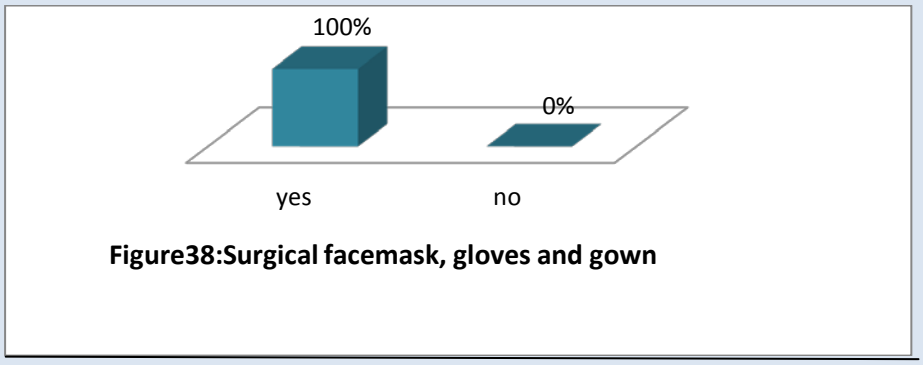


Figure38:Surgical facemask, gloves and gown

100% staff is aware about the PPE used- surgical facemask, gloves and gown.

- **Goggles**

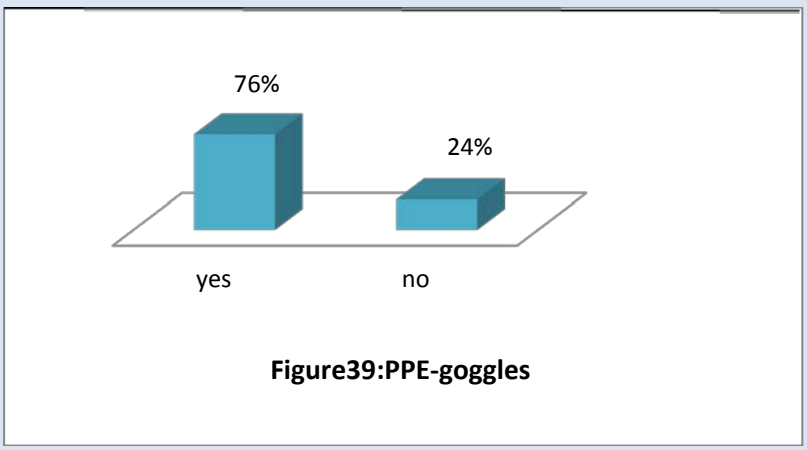


Figure39:PPE-goggles

Only 76%staff is aware that goggle is also used for infectious patients

And 24% staff is not aware that goggle can be used as PPE.

- Instruct patient to wear a facemask when exiting the room, avoid coming into close contact with other patients-

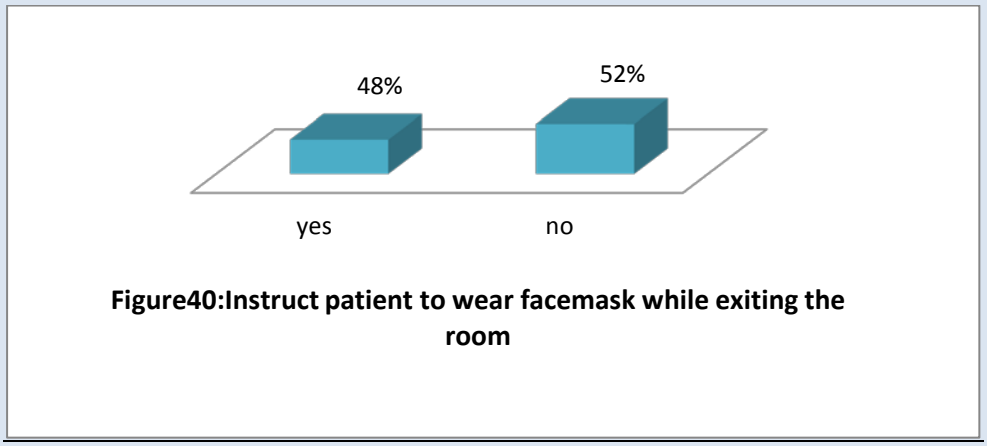


Figure40:Instruct patient to wear facemask while exiting the room

48% staff is aware to instruct patient to wear a facemask when exiting the room

52% staff is not aware to instruct patient to wear a facemask when exiting the room

- Provide a facemask (e.g., procedure or surgical mask) to the patient and place the patient in room with a closed door

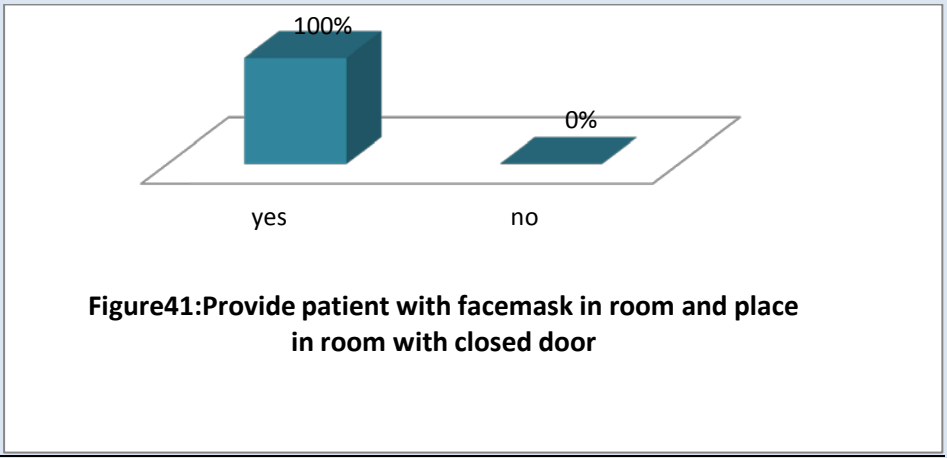


Figure41:Provide patient with facemask in room and place in room with closed door

- Instruct the patient to keep the facemask on in room, if possible, and to change the mask if it becomes wet-

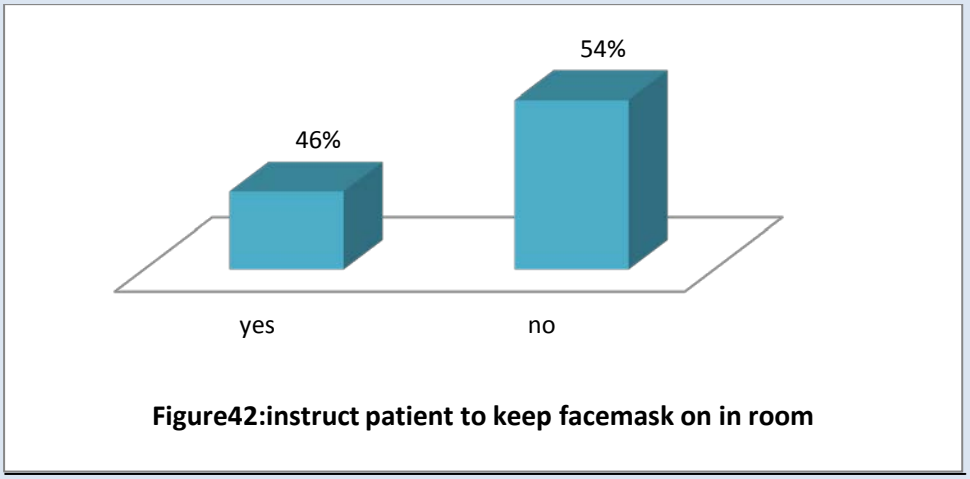


Figure42:instruct patient to keep facemask on in room

46% staff is aware that they have to instruct the patient to keep the facemask on in room, if possible, and to change the mask if it becomes wet

54% staff is not aware that they have to instruct the patient to keep the facemask on in room, if possible, and to change the mask if it becomes wet

3.1.4.CAUTI (catheter associated urinary tract infection)

(According to CDC)

CAUTI

(Interviewed the staff and observed patients)

- Catheter insertion-

It is indicated in-

Acute urinary retention

Measurement of urinary output(critical pts)

Preoperative

Pts with prolonged immobilization

End life care comfort

100% followed.

- Leave catheter in place-

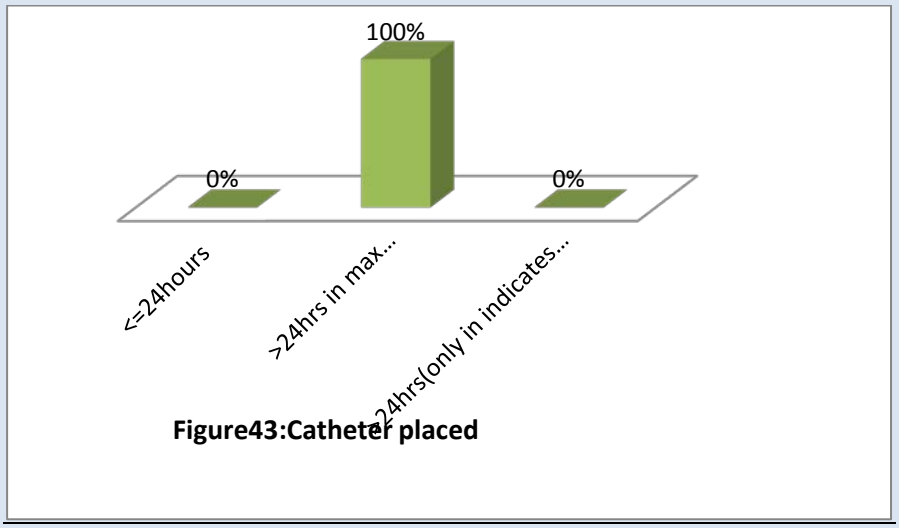


Figure43:Catheter placed

Catheter is placed for 48-72 hours

But the catheter should be placed for 24 hours and should only be placed in recommended patients for more than 24 hours. This *increases the chances of CAUTI.*

It can be considered as the infection rate reported is 1-2 in last 3 months.

- Hand hygiene-

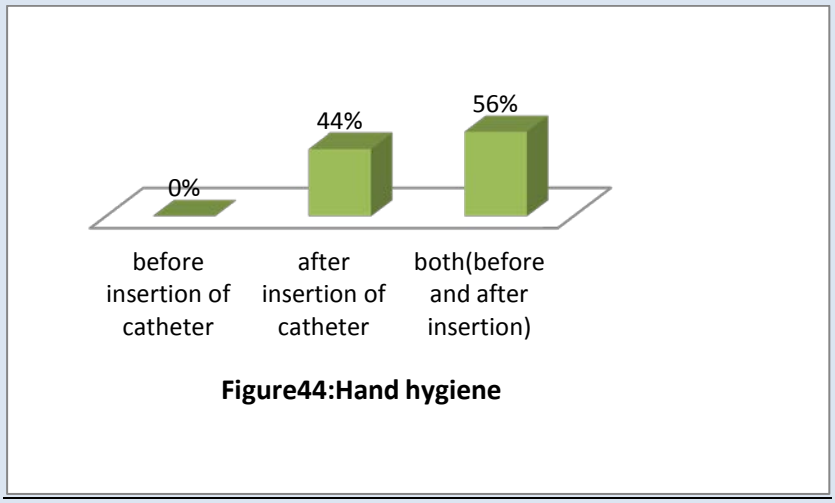


Figure44:Hand hygiene

(Hand hygiene should be done both before and after insertion, to avoid spread of infection.)

But only 56% are aware about hand hygiene is to be done both before and after insertion though

100% people are aware about PPE to be used.

- Secure catheters-

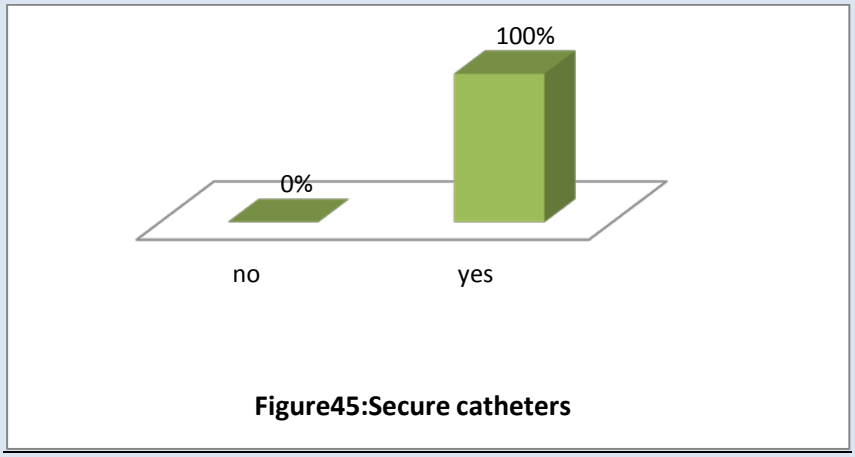


Figure45:Secure catheters

100% followed.

They are inserted by the professionals and are secured.

- Replace catheter-

Catheters are replaced when

Leakage

Disconnection

Advised by doctors (if patient need prolong catheterization)

Purpose – to avoid infection

- Placement of catheter, collecting tube and urinary bag-

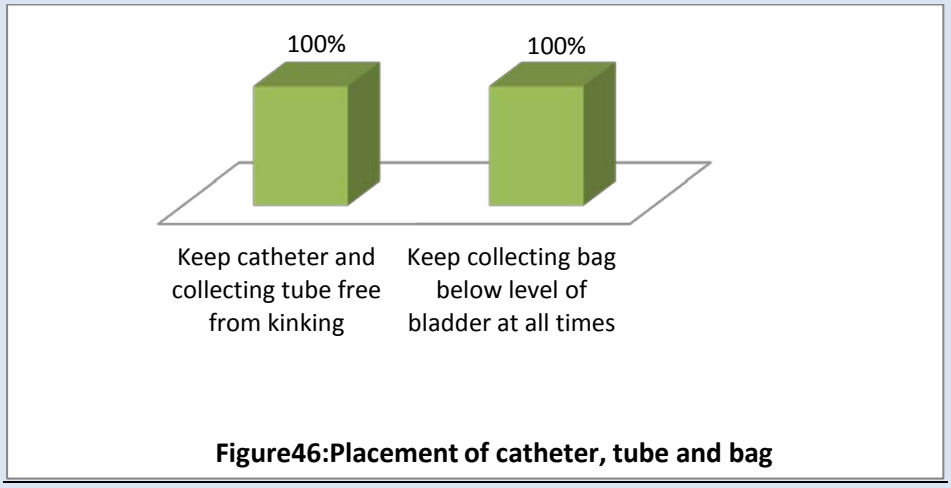


Figure46:Placement of catheter, tube and bag

Purpose- to maintain unobstructed urine flow

Avoid CAUTI

Recommendations- Catheter and collecting tubes are kept free from kinking and

Collecting bag is kept below level of bladder.

- Empty collecting bag-

It is emptied regularly when filled

But there are not separate urine pots for each patient and all staff is not aware for the same.

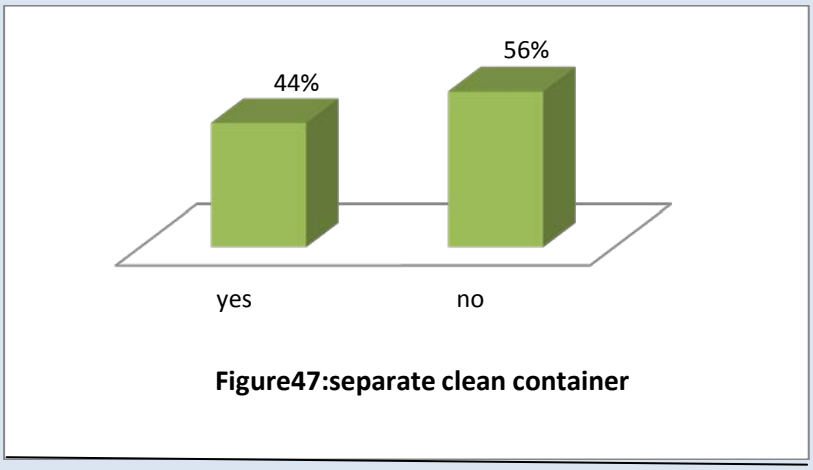


Figure47:separate clean container

(Only 56% staff was not aware about separate and clean containers)

- Drainage spigot-

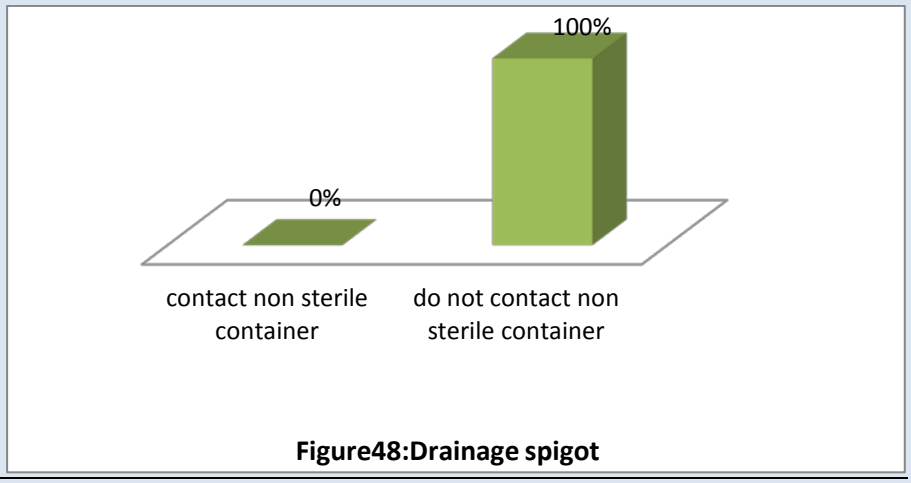


Figure48:Drainage spigot

(When emptied the drainage spigot do not contact the non sterile container)

3.1.5.CENTRAL LINE INFECTION

Central line infection

(Based on interview)

(According to CDC)

- Removal of central lines-

  Unnecessary central lines are removed when indicated by the professionals after the daily audits (doctor's visit).

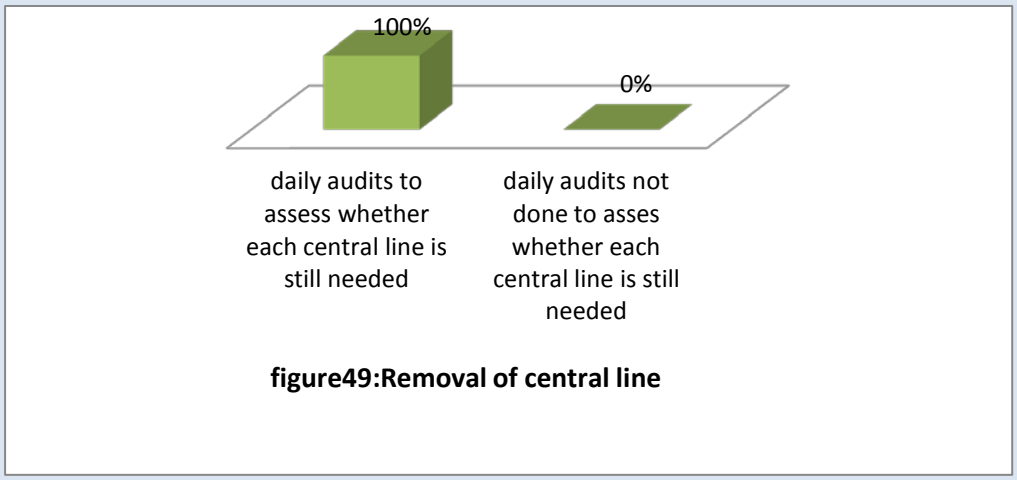


figure49:Removal of central line

- Hand hygiene-

  It should be performed both before and after the insertion of central line.

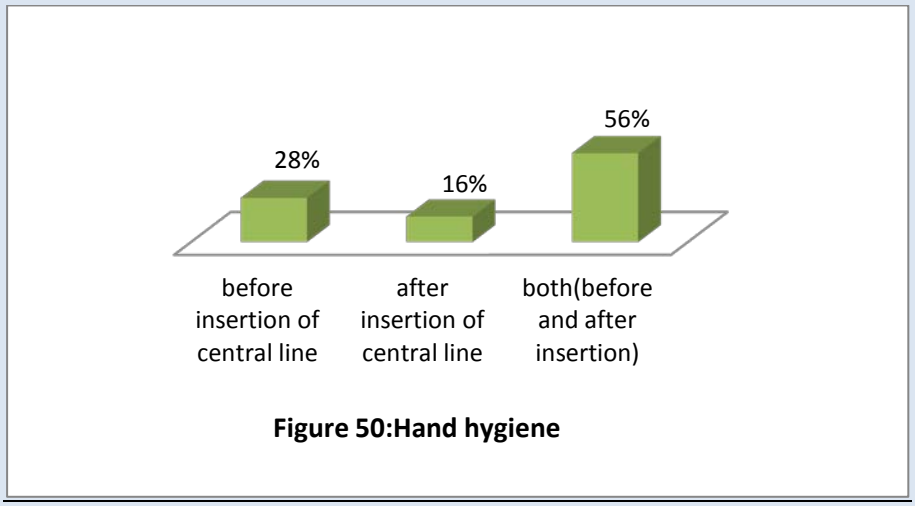


Figure 50:Hand hygiene

(But only 56% of staff in ICU is aware)

- Sterile barrier precautions-

Mask

Head cap

Gown

Sterile gloves

Sterile full body drape

Staff is aware of all the PPP to be used and uses mask head cap and gloves on regular basis and gown and drape if they suspect a highly infected patient.

- Skin antisepsis –

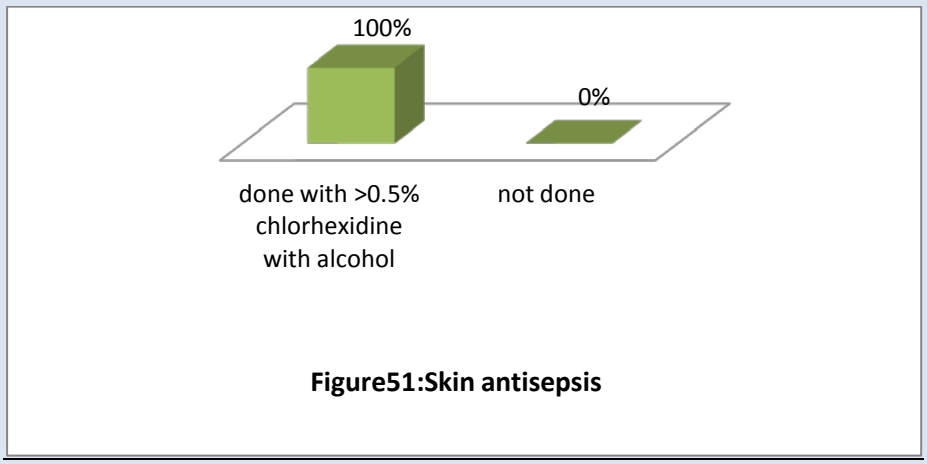


Figure51:Skin antisepsis

(Skin antisepsis is done with chlorhexidine to avoid infection)

Site is covered bysterile gauze.

- Replace dressings-

  Dressings are replaced when

  Wet

  Soiled

  Dislodged

Figure52:Replace dressings

(100% followed)

- Dressing-

  Dressing is performed under aseptic precautions using sterile gloves.

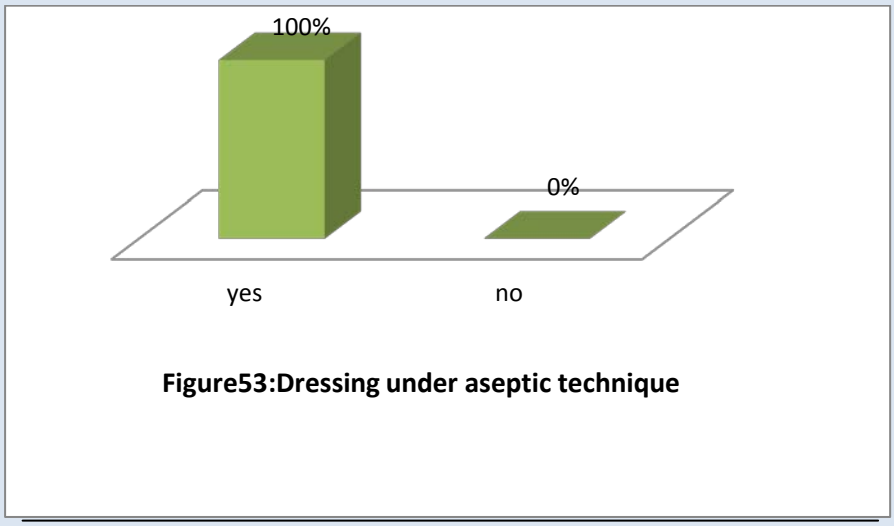


Figure53:Dressing under aseptic technique

(100% followed)

- Scrubbing of the access port or hub-

Standard practice-Scrubbing of the access port or hub immediately prior to each use with an appropriate antiseptic (e.g., chlorhexidine, povidone iodine, an iodophor, or 70% alcohol).

But it is not performed.

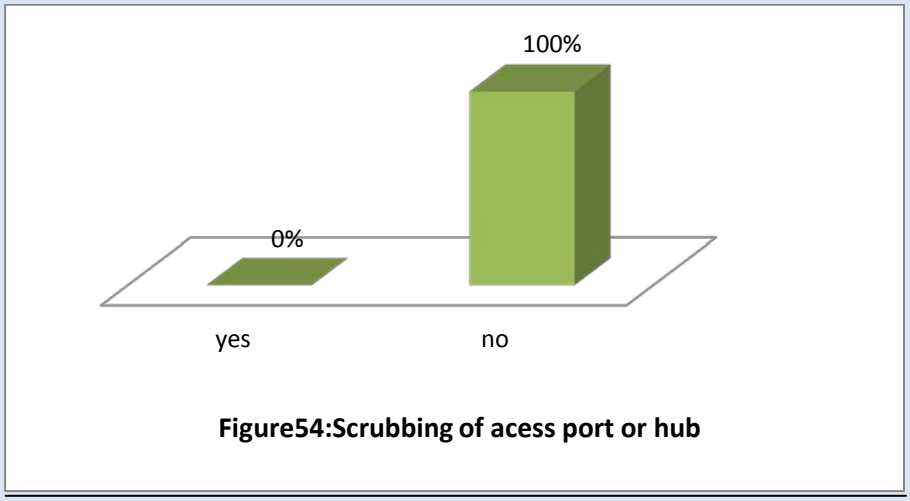


Figure54:Scrubbing of acess port or hub

- Education sessions-

Provide recurring education sessions on central line insertion, handling and maintenance.

Staff should be provided with recurring sessions regarding central line.

But they are given training only at the time of employment.

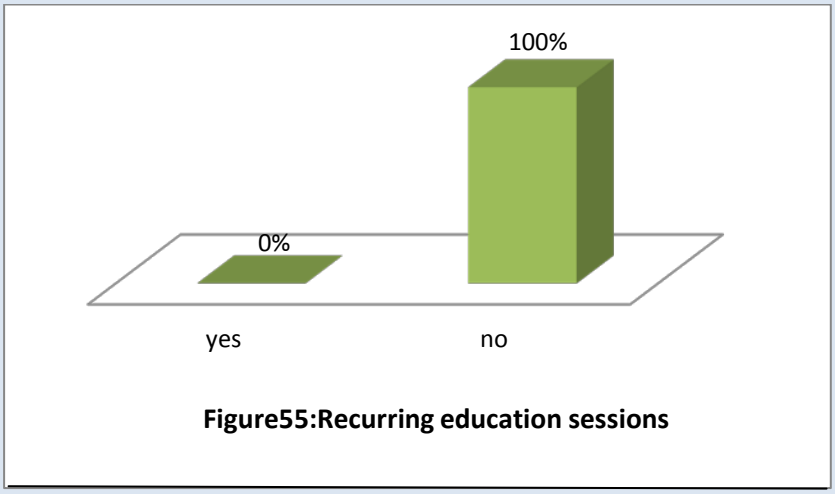


Figure55:Recurring education sessions

3.2.SUPPORTING SERVICES

It includes CSSD ,housekeeping Kitchen,laundry,operation theatre,biomedical waste management.

3.2.1.CSSD

CSSD

(15 days observation)

(According to CDC)

- PPE (personal protective equipments)

It includes gloves, mouth masks, head caps and gowns if required

100% staff is aware of it and follows it regularly

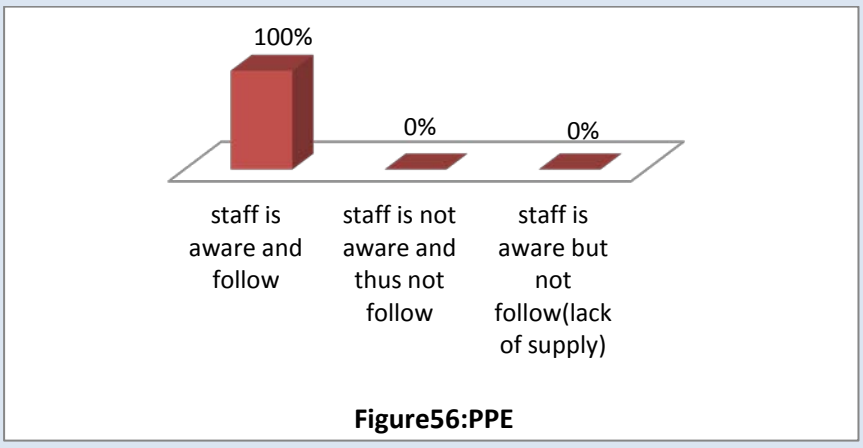


Figure56:PPE

Before entering into CSSD staff wears slippers and before entering clean area staff change their clothes in changing room and wear their uniform.

- Unidirectional flow-

  There is a different receiving area and dispatch area to avoid infection of the sterilized equipment and material.

  100% followed by staff.

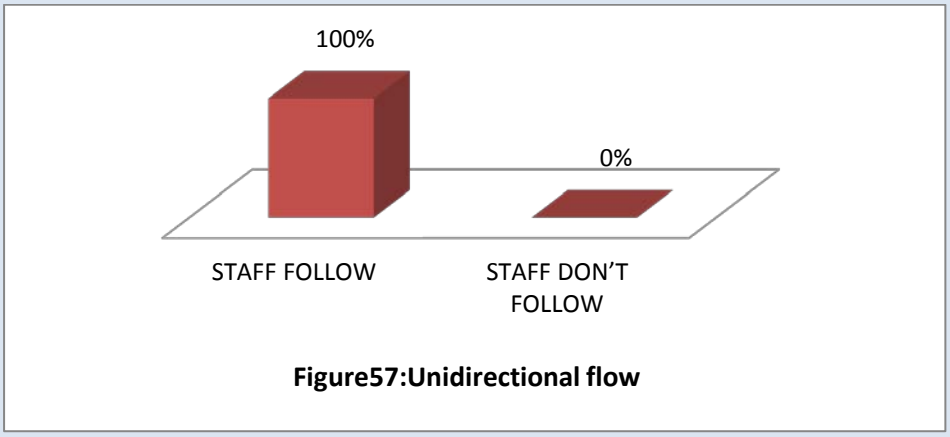


Figure57:Unidirectional flow

- Clean patient care items-

  Before high-level disinfection and sterilization process patient care items are cleaned-

  Manually
  Mechanically-ultrasonic cleaners
  Washer-disinfector
  Washer-sterilizer

100%followed

Purpose- It is done to remove any blood stains, body fluids, body parts from the instrument before undergoing the process of high-level disinfectant and sterilization.

- Discard or repair instrument-

  It is done when

  No longer functions as intended

Cannot be properly cleaned, and disinfected or sterilized

On observation, it was found that it is done by the maintenance department and the professionals of the patient care areas.

Instruments are also discarded according to the manufacturer instructions.

- Flash sterilization-

It is not done on a regular basis for convenience, alternative to purchasing additional instrument sets, to save time.

It is done when patient-care items that will be used immediately, patient-care items that cannot be packaged, sterilized, and stored before use.

It is mainly carried out in operation theatre if any instrument falls and is needed urgently and we don't have any alternative option.

- Aeration of EtO sterilizer-

EtO sterilization is used for heat and moisture sensitive critical equipments.

Importance- as the gas is carcinogenic in nature thus the aeration time and temperature is very important to be followed.

Actual time and temperature- 12hrs, 50-60 deg C

100% followed

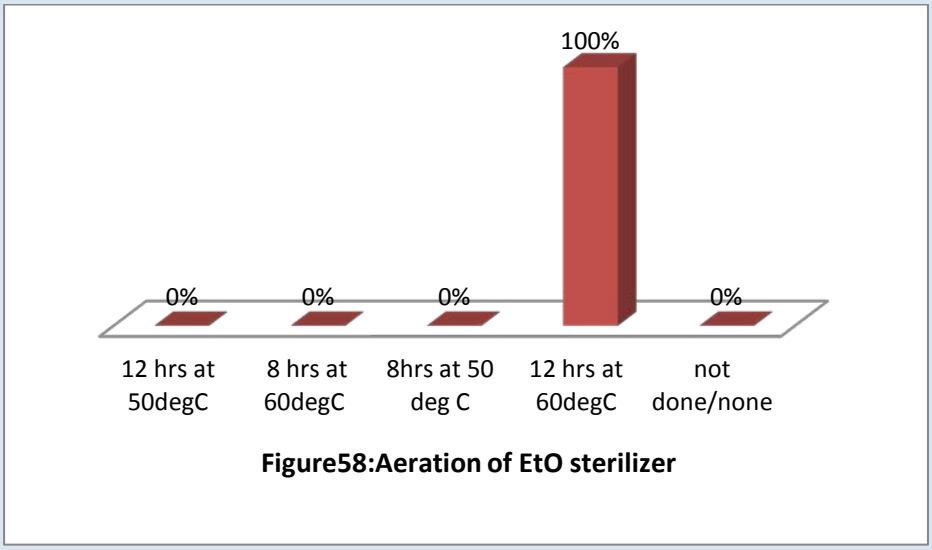


Figure58:Aeration of EtO sterilizer

On observation, it was seen that aeration was done at 60 deg C for 12 hours.

- Packaging material

The packaging material used here is

Puncture resistant

Not tear resistant

It has a plastic cover and a paper cover, so sometimes paper cover is torn if not packed correctly.

- Monitoring of sterilizer

It is done to check the efficiency of the sterilizer and can be done by

Mechanical monitors

Chemical monitors

Biological monitors

Mechanical monitors and chemical monitors are used daily with each cycle and the records are maintained.

Biological monitors are used weekly for steam sterilizer and for each cycle of EtO.
100% followed, cross checked with the records.

- Mechanical monitors-

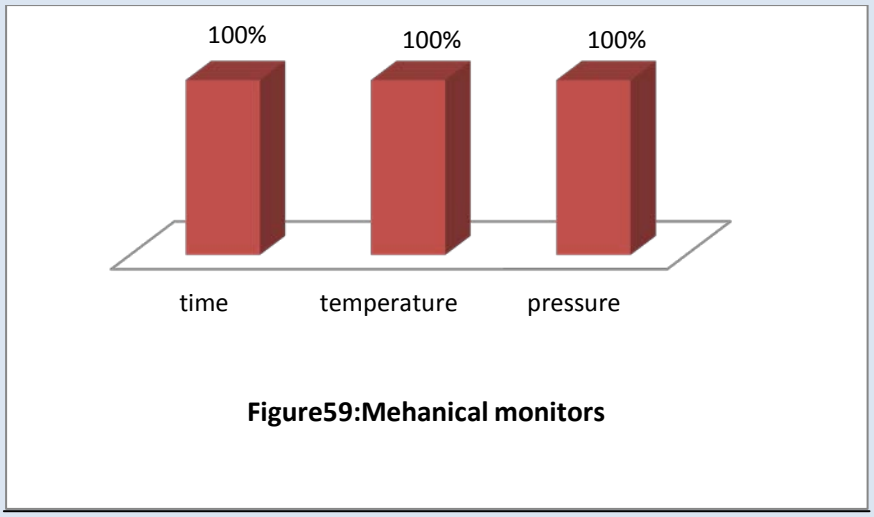


Figure59:Mehanical monitors

Time, temperature and pressure are monitored for each cycle and for every sterilizer.

And records are maintained for the same.

100% followed

- Inadequate processing-

  If any of the above monitors show an error-inadequate processing, then the material and equipments of that load number should not be used and should be reprocessed.

  100% followed.

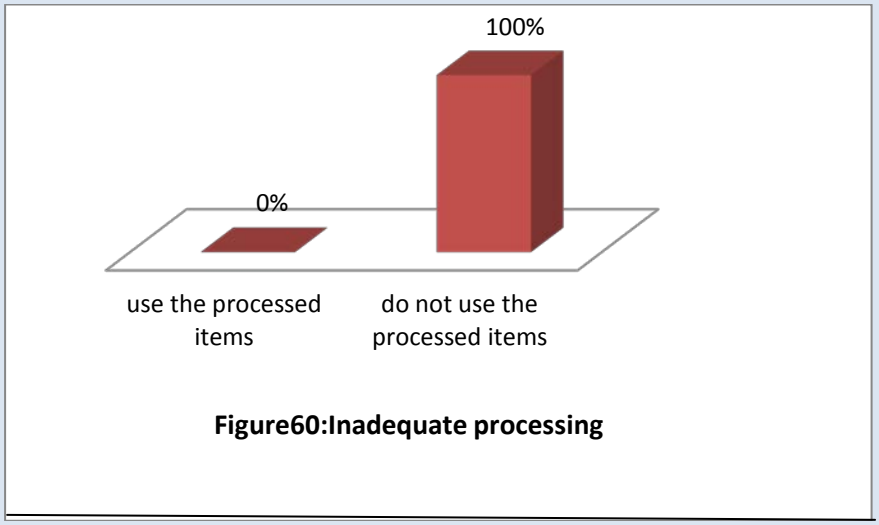


Figure60:Inadequate processing

- Biologic indicators-

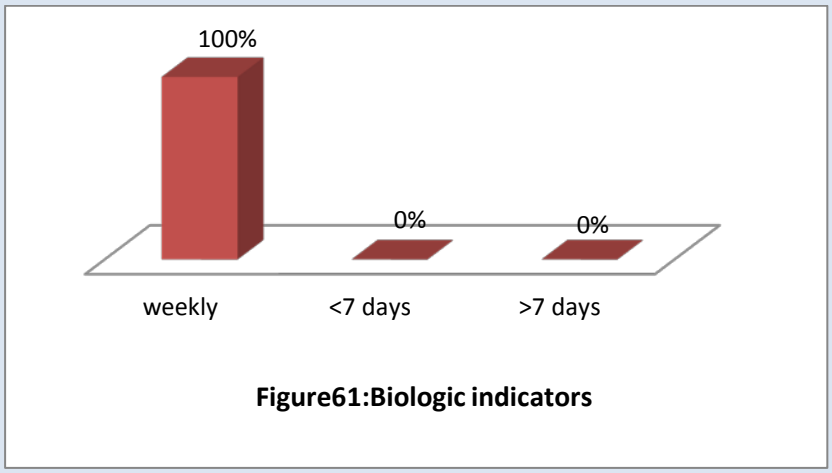


Figure61:Biologic indicators

Used- weekly for steam sterilization

In each EtO cycle

These are expensive indicators and as per recommendations they should be used weekly only.

100% followed.

- Items to be sterilized-

When placed in cart/ basket/ shelf- ***loosely and correctly*** placed

Importance- easy penetration of steam

Effectiveness of steam increases

Increase in exposure area

Effective sterilization

100% followed.

- Storage-

The sterilized items are stored in

Sterile area

Protected against dust, moisture, insects, temperature and humidity extremes.

Well ventilated area

- Labeling of the sterilized items

Each sterilized item is labeled with

Sterilizer used

Cycle or load number

The date of sterilization

The expiration date

Purpose- if any of the monitors give an indication of inadequate processing then the items of that load number can be collected back and reprocessed.

Unused items after passing of expiry date is sent back for re sterilization

100% followed.

Training of staff-

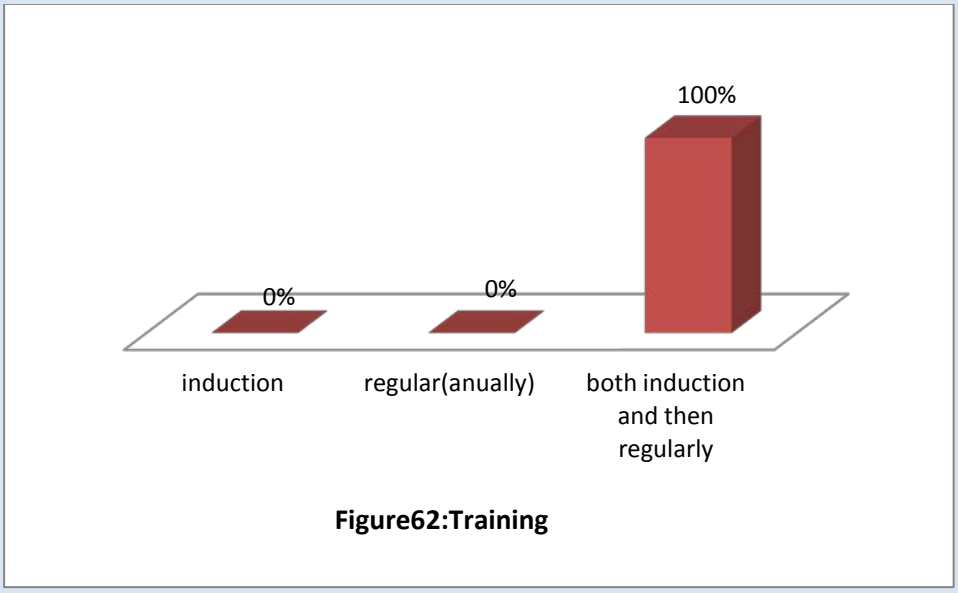


Figure62:Training

Comprehensive and intensive training is provided to all the staff.

Trainees are ***supervised*** during the training period unless and until the supervisor is confident that the trainee can function independently.

- Competency testing-

  It should be performed at beginning of employment and thereafter regularly (at least annually).

  Purpose- to check staff knowledge and its implementation by them.

  But there is *no regular testing* is done.

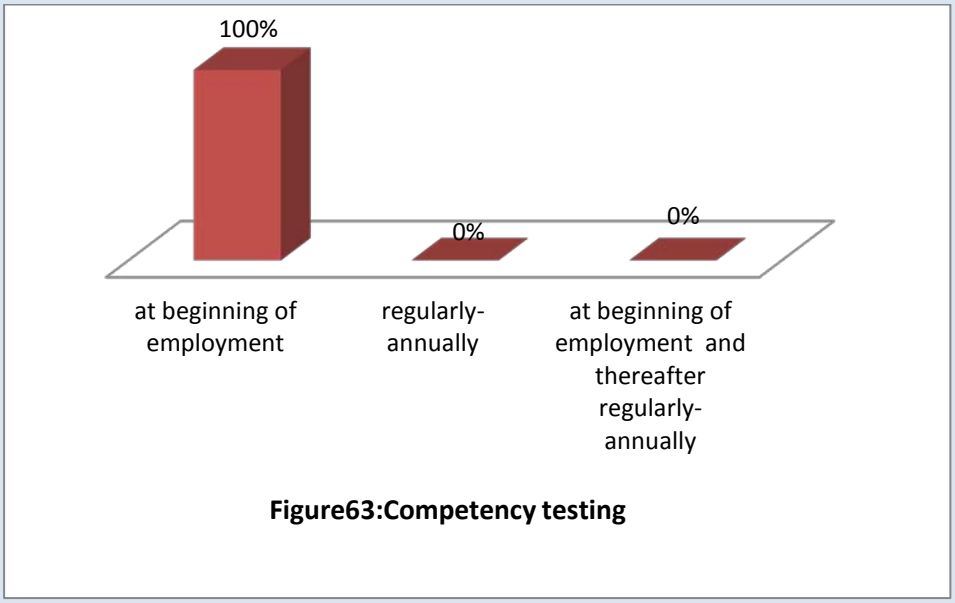


Figure63:Competency testing

.

- Records-

For each sterilization cycle-

Type of sterilizer and cycle used
Load identification number
The load contents
Exposure parameters (e.g., time and temperature)
Operator's name or initials
Results of mechanical, chemical, and biological monitoring

Purpose- to avoid infection, by reprocessing the items of a particular load number if any of above monitors shows inadequate processing.

100% followed.

The above records are available ***for 2 years.***

3.2.2.HOUSEKEEPING

Housekeeping

- PPE-

During observation, it was seen that only 50% of staff is well aware about the PPE to be used and use them regularly.

PPE availability is also a problem,which is to be taken care of.

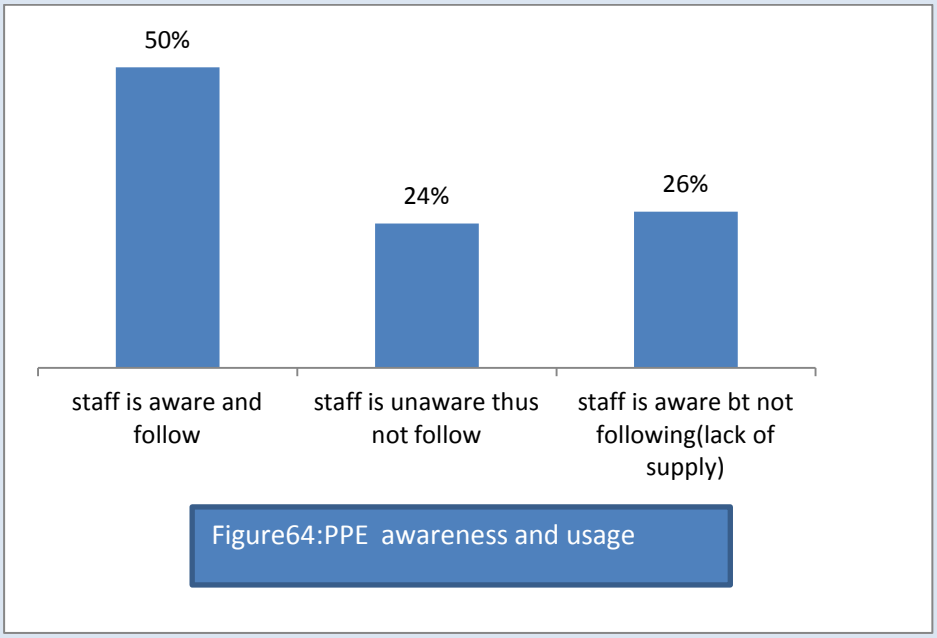


Figure64:PPE awareness and usage

- Clean housekeeping surfaces-

Includes- Table tops

Floor

Cleaning protocol-

Regular basis (3 times in each shift)

Shifts- 6am-2pm

2pm-10pm

9pm-7am

When spills occur

Housekeeping surface is visibly soiled.

These records are maintained with the housekeeping department-

Room check list

Toilet check list

Floor cleaning checklist

Cleaning protocol for walls, windows curtains, blinds-

When visibly contaminated or soiled

When patient is discharged from the room

- <u>Floor mopping solution-</u>

Though there is a policy to change the solution after 3 rooms or if visibly dirty before that. But it is not followed by the staff.

During observation, it was seen that the solution and the water was changed either after finishing the whole area under the staff or when visibly it's dirty (not specified).

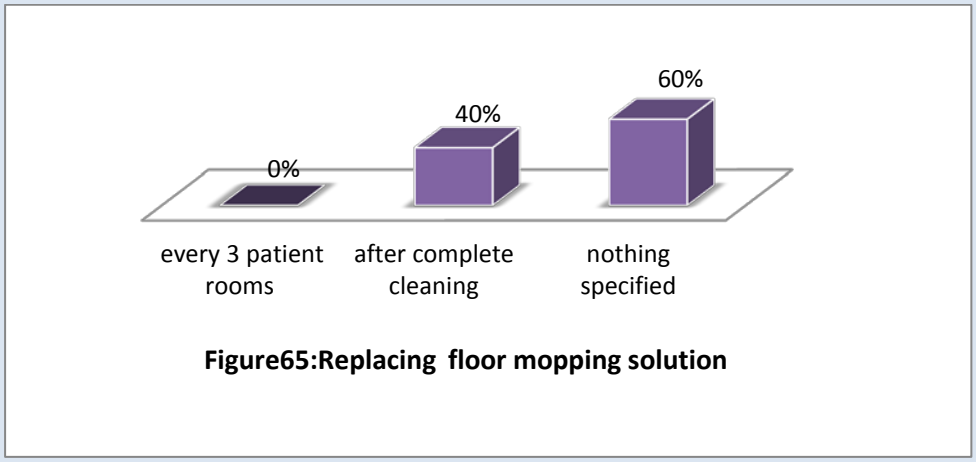


Figure65:Replacing floor mopping solution

60% of staff is changing whenever they see that the solution is visibly dirty.

40% staff is changing the solution when they finish their area of cleaning.

- <u>Decontaminate mop heads and cleaning cloths-</u>

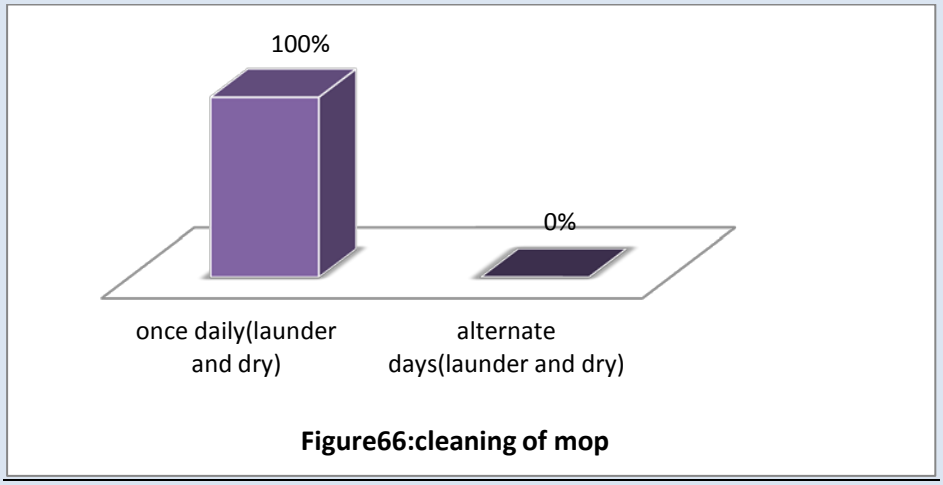


Figure66:cleaning of mop

Mop heads are daily washed after the cleaning and are kept dry at the respective housekeeping station.

Separate mops are used from different areas and are not interchanged or used in other areas (i.e. specific mops for specific areas.)

- Cleaning of non - porous floors

On regular basis, dry mopping/ dry dusting followed by wet mobbing are done.

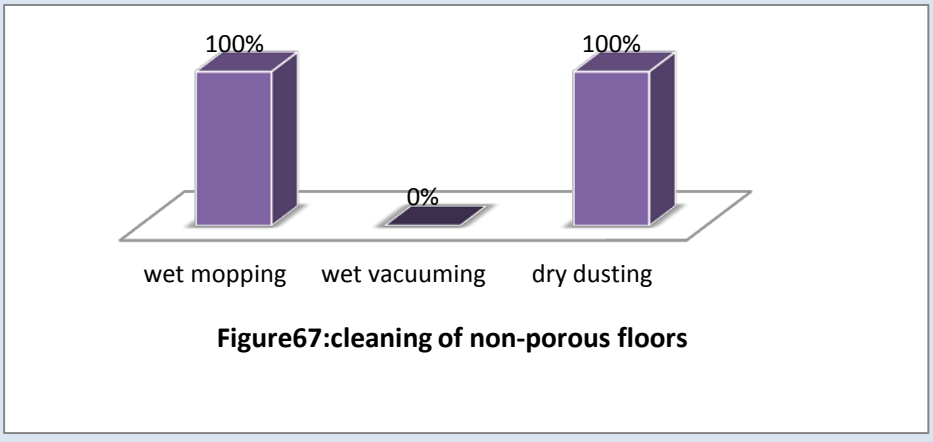


Figure67:cleaning of non-porous floors

- Mop left after cleaning

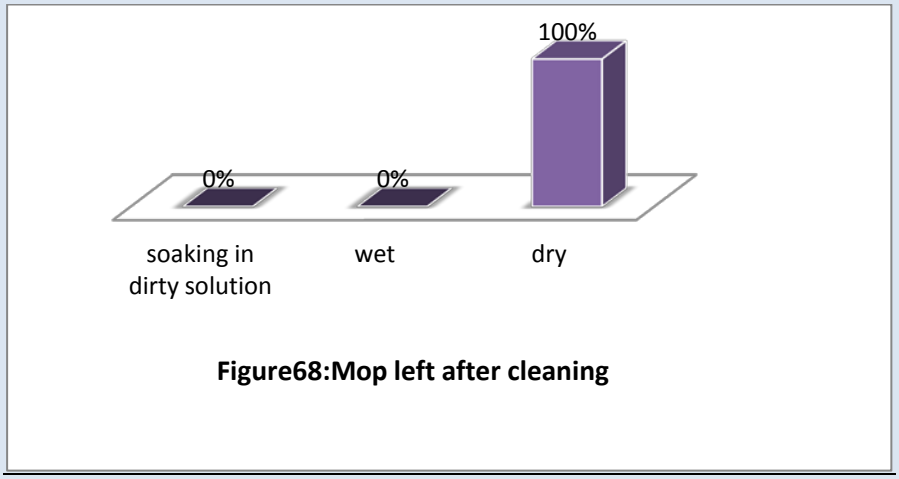


Figure68:Mop left after cleaning

Mop is always kept in the housekeeping station after the complete cleaning and laundry of mop head.

It is then kept dry with the mop head facing upwards.

- Disinfectants to clean infant bassinets and incubators while these items are occupied-

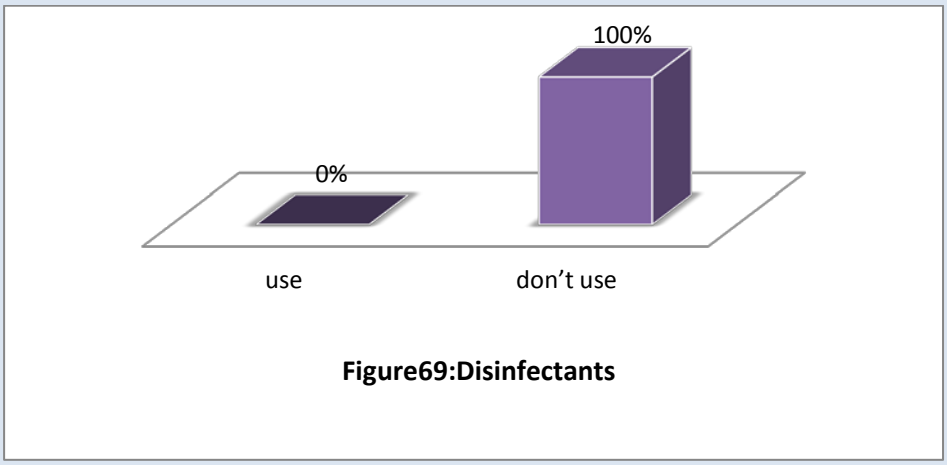


Figure69:Disinfectants

As recommended, it should not be used and thus it is 100% followed.

- Chlorine solution-

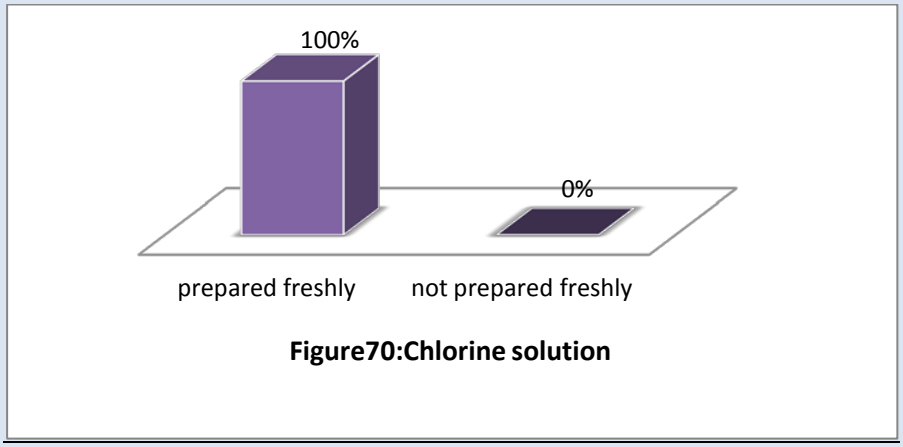


Figure70:Chlorine solution

Chlorine solution is always prepared freshly in the ratio of 200:800 ml Chlorine: water

- Wet mopping-

During observation it was seen that all the staff follows motion 8 during wet mopping

Importance- To carry out all the dirt and waste, collect it at a point
Avoid dirt to move back to the clean area.

It was also seen that 100% staff hold the handle away from the body as recommended.

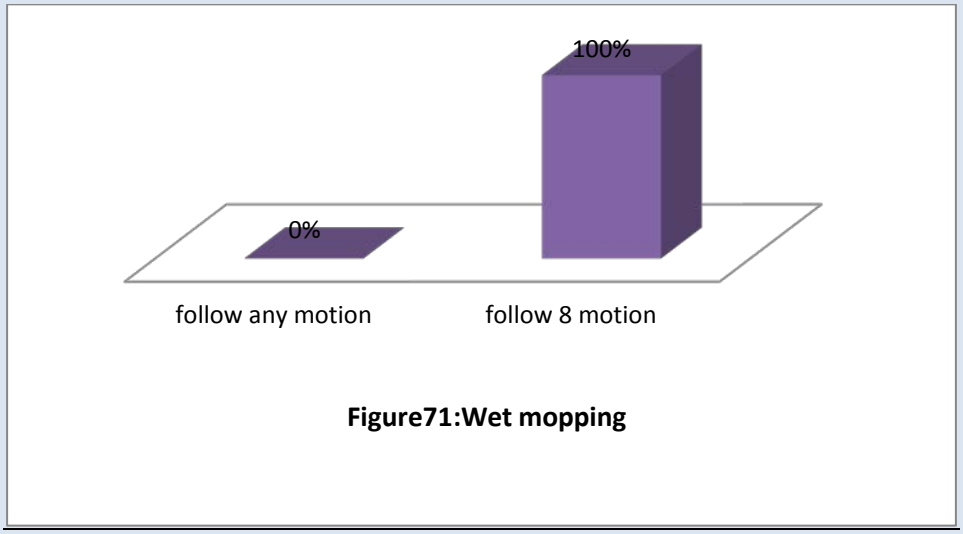


Figure71:Wet mopping

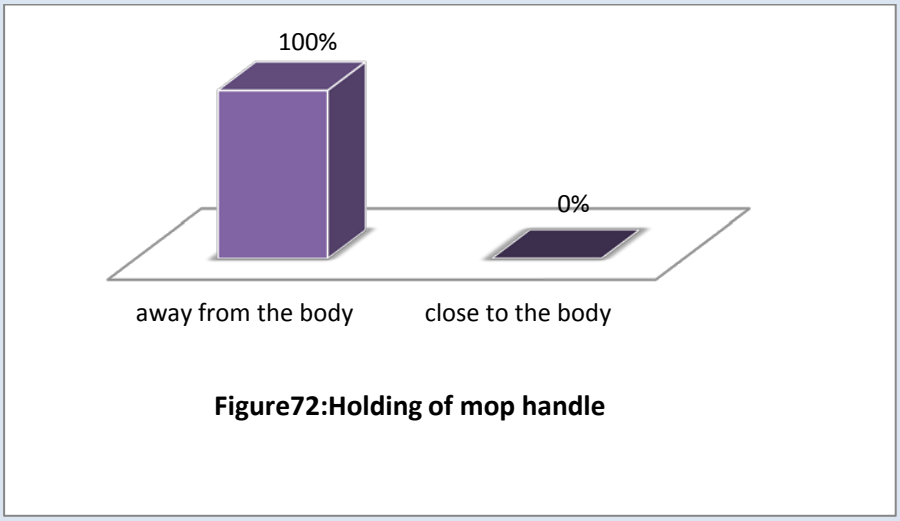


Figure72:Holding of mop handle

3.2.3.KITCHEN

Kitchen

(15 days observation)

- PPE (personal protective equipments)-

  Staff is well aware of the PPE to be used and regularly uses head caps.

But use of gloves-

100% followed while serving food

47% followed while making food.

This can lead to infection from the staff to patients.

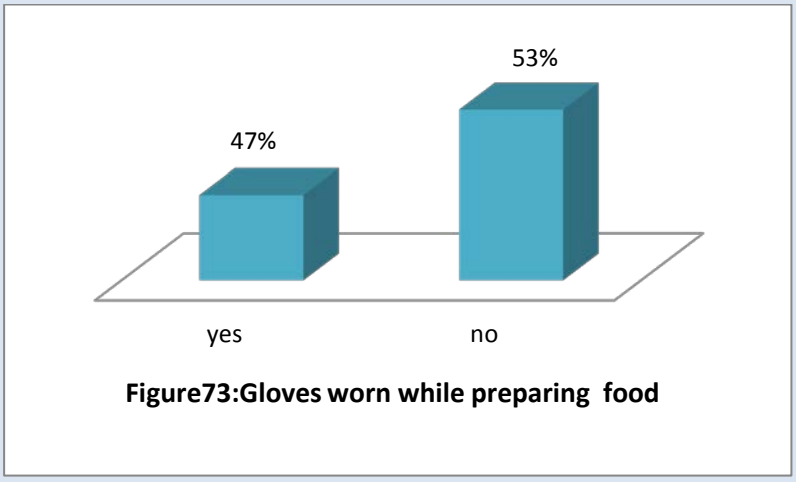


Figure73:Gloves worn while preparing food

- Jewelry-

  Staff should try avoiding wearing jewelry as it is the source of infection from outside and thus there can be transfer of infection from staff to patient.

  On observation, it was seen that maximum staff was male staff and.
  Where the male staffs were not wearing jewelry except few rings

  So jewelry to minimum was followed 100%

- Nails-

These are the source of infection from outside and are not easily cleaned as the dirt collects deep inside the nails, so it is advised to keep the nails short and clean.

On observation, it was seen that it is followed 100% and nails of all staff is checked on a regular basis in the beginning of shift by the supervisor.

- Milk and milk products-

  They are stored at a right temperature and are labeled to ensure that they are used within the time limit.

  100% followed.

- Food items-

  Food items are also labeled – time of preparation and time till which it can be consumed.

  It is packed and stored at a right temperature.

  On observation,

  E.g. - after chopping of vegetables they are packed, labeled and stored, so that before consumption it can be cross checked

  And it is 100% followed.

- Preparation of food -

  The vegetables are purchased one day before in evening according to the menu and the strength of the hospital. And chopping of vegetables is done in night for the next day morning

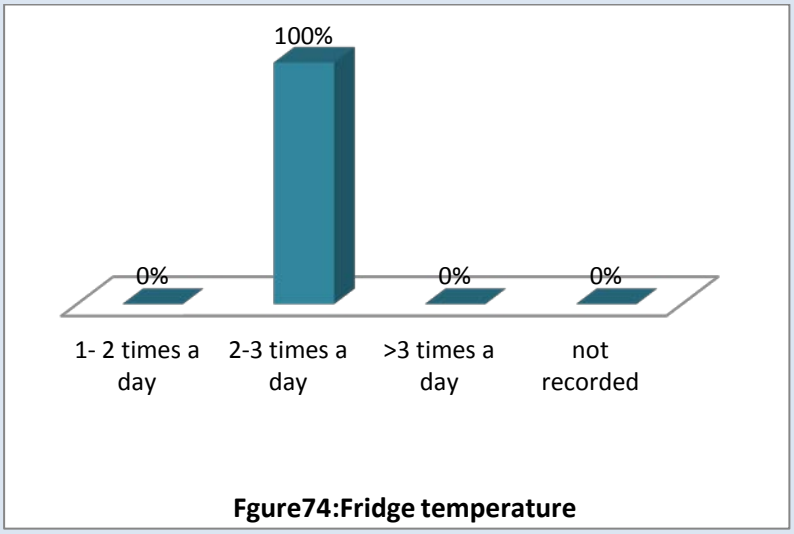
  And preparations for lunch and dinner are done on the same day.

  This is followed regularly.

- Fridge temperature-

  It is recorded daily and maintained.

  Temperature is recorded 4 times a day on a regular basis.



Fgure74:Fridge temperature

This helps in proper functioning of fridge and thus avoids any contamination of food.

- Food temperature-

  Actual temperature for hot and cold food during serving is to be maintained should be

  63 deg C for hot food
  5 deg C for cold food

  On observation, it was seen that the temperature was maintained for hot food but the staff is not aware about the temperature.

- Dispatch

  Taste- daily food is tasted by the dietician before serving and packing of food.

  This is done to cross check whether any contaminated food is not served to the patient.

- Packing-

Regularly, every meal of the patient is packed and then transferred. Even the mid meals and the drinks for the patient are packed and served daily.

100% it is followed

There are slips with the name, ward of the patient and also if any specific instructions (changes in food) are mentioned and is placed above the packed plates.

- Infected patients-

This category of patients include

HIV
Skin diseases
Boils
Burns

Yes, 100% special precautions are taken.

The food is packed in disposables and then served. And the stewards are given special instructions regarding them – to take precautions while serving, and to cross check before serving for the disposable plates.

- Patient identity-

Patient identity must be checked by asking the patient or its relatives or the staff for the patient's name to avoid any exchange of food (as food is served according to patient's requirements).

On observation it was seen that,

In ICU- patient identity is cross checked with the help of files on the medication table kept near the bed. This can lead to medical errors, if the files of the patients are exchanged and patient gets different food and not as prescribed by doctors and dieticians.

In WARDS- patients are given food according to the room numbers and cross checking of files which may also lead to medication error if the files are changed or patient is transferred on different bed or room.

- Visitors in kitchen-

As visitors are the source of infection from external environment and thus they should not be allowed in kitchen.

100% followed and patient relatives and visitors are not allowed inside the kitchen and if the staff enters then it is compulsory to wear head cap.

3.2.4.LAUNDRY

LAUNDRY

(15 days observation)

- Unidirectional flow-

There should be a separate area for dirty laundry collection and a different area for fresh laundry dispatch. This helps in avoiding recontamination of washed clothes.

But when observed it is not followed regularly, and the clean linen is also collected from the dirty area. It was seen that 67% time it is followed and 33% it is not followed.

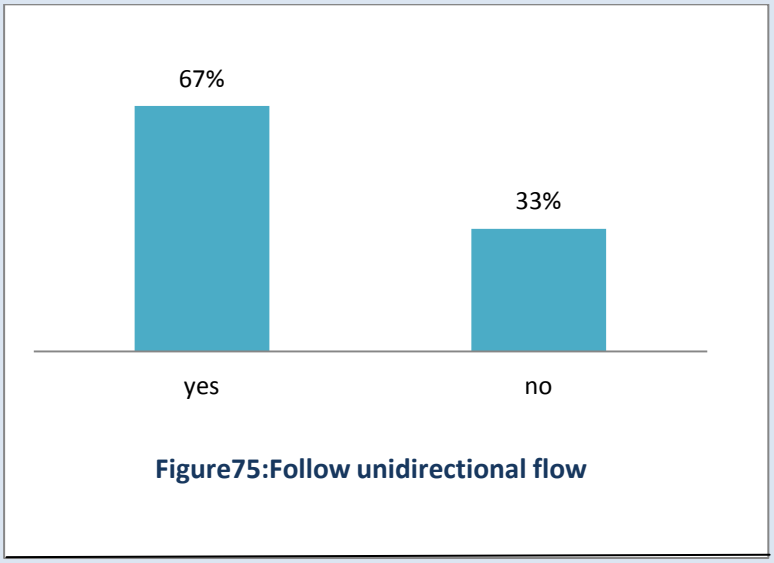


Figure75:Follow unidirectional flow

- Segregation of clothes

  Linen can be dirty linen and soiled linen which have different washing procedures. It should be segregated in laundry and not work place.

  On observation, when linen is collected in laundry then it is segregated into soiled and dirty and sometimes it is brought differently as soiled and dirty linen.

- Pressure-

  Negative pressure is not exactlymaintained in the receiving area but the laundry is isolated from the patient care area to avoid the spread of infection.

- Sorting laundry

Laundry should be sorted out in dirty area for needles, syringes and patient property, to avoid recontamination of laundry by infected needles and syringes and thus avoid spread of infection. It is also done to avoid any damage to the machine.

On observation, it was seen that there was a different area for sorting laundry and also the staff was aware about it and they are following it.

100% it was not followed.

- Textiles-

If the textiles are wet then it should not be kept wet overnight. This provides bacteria a favorable environment for its growth. Most of the OT linen is wet and is stored overnight because laundry is outsourced and vehicle comes to collect the linen once in 24 hrs.

- Packing- (according to CDC & HICPAC guidelines)

Clean linen should always be packed and then dispatched and transferred.

This avoids the recontamination of the linen during transfer and thus avoids the transfer of infection from patients and staff.

On observation, it was seen that this is not followed, packing of clean linen was not done and it was transferred openly.

100% it is not followed

- Drainage-

Laundry is totally outsourced so not observed.

. Linen change policy-

There is linen change policy of 60 washes(Rental linen) and 90 washes(hospital owned linen). But the staff is unaware about the policy.

- Washing protocols-

There are different washing protocols for different clothes like-

Soiled linen
Infected linen
Blankets
OT dresses

This avoids transfer of infections and also avoids damage of clothes.

Soiled linen and infected linen- they are segregated at the point of collection in laundry and are packed in different packets but transferred in same vehicle ,this can be a source of infection. So this should be avoided.

.

Storage-

Clean linen should be stored in a dry clean area and above the floor level.

On observation,

It was seen that the clean linen is stored in cupboards (clean and dry area and above the floor level).

It was seen that it is 100% followed that it is daily stored in cupboards.

3.2.5.OPERATION THEATRE

(According to NABH)

OPERATION THEATRE

The OT is so spaced that it can be occupied by *5-8 persons at any given point of time* depending on the surgery (general or super specialty).

- Air changes in OT-

  Weekly, air changes are measured by *anemometers* with help of engineers and are maintained in records in the maintenance department.

  When the records were cross checked it was seen that the air changes in OT were

  25-30 in super specialty OT (normal 30 air changes)
  20-25 in general OT (normal 25 air changes)

- Air components-

There is accurate number of fresh air components of the air change

05- super specialty OT
04- general OT

- Air velocity-

  Velocity of air is also checked weekly and is maintained in records.

Direction- air is directed such that it *unidirectional and downwards* towards the OT table.

It is directed so that the air coming out of the diffusers should be able to Carry bacteria carrying particle load away from the operating table.

- Pressure-

  There is a requirement to maintain *positive pressure* differential between OTand adjoining areas to prevent outside air entry into OT and thus avoid infection.

  Pressure is also checked on a *weekly basis* by the maintenance department and records are maintained.

  0*.001-0.003 kilopascals* positive pressures is maintained (normal-15 pas)

- HEPA filters

  These are fitted in the *ceiling of the OT* and the air is passed through HEPA filters before entering in OT.

  The size of HEPA filters are planned such as they *cover the OT table and the surgical team* to avoid the bacterial infection.

  8' * 6' (super specialty)
  6' * 4' (general)
  (According to NABH standard)

- Exhaust grille (return air)

  These are fitted at *the floor level – approx 6 inches above the floor level* so that the air passes downward from the OT table and moves out via exhaust grille and thus unidirectional flow is maintained

- Temperature and Humidity

Both temperature and humidity is monitored regularly

OT display panel are installed inside OT to display and monitor the temperature and humidity.

These are recorded daily in files by the engineers and are submitted weekly in the maintenance department.

And if there is any problem then it is corrected accordingly.

20-24 deg C is maintained (21+/-3 deg C –normal)
45-60% humidity is maintained (40-60% - normal)

- Rh

Ideal Rh is maintained that is 55%

- AHU blower

For air filtration AHU blower are there in OT which are *dedicated one* for each OT and also these are *operational round the clock* even in non functional hours.

- Air conditioner (ac)

There *is neither any window air conditioner nor split air conditioner* in OT because they are pure re circulating units and have convenient pockets for microbial growth which cannot be sealed.

- Flooring, walls and ceiling

Non porous

Smooth

Seamless without corners

This is essential to avoid infection by repeatedly cleaning it easily.

- Maintenance

  There is scheduled weekly preventive maintenance done and the records are maintained in the maintenance department.

  Cleaning of pre-filters is done in 30 days which should be done in 15 days according to the NABH guidelines

3.2.6.BIOMEDICAL WASTE MANAGEMENT

Biomedical Waste Management

- Authorization-

  Biomedical waste disposal is outsourced for the hospital. The authority is authorized by the state govt.

Pt of generation (wards, ICU, patient care areas)

↓

Collection of waste

↓

Transferred

↓

Weighted

↓

Stored

↓

Disposed off via a vehicle that comes for collection (ETEC)

POINT OF GENERATION-

- Shall be segregated into containers / bags-

  On observation it was seen that there are different color coded bags and container (for sharps) available in all patient care areas and wards.

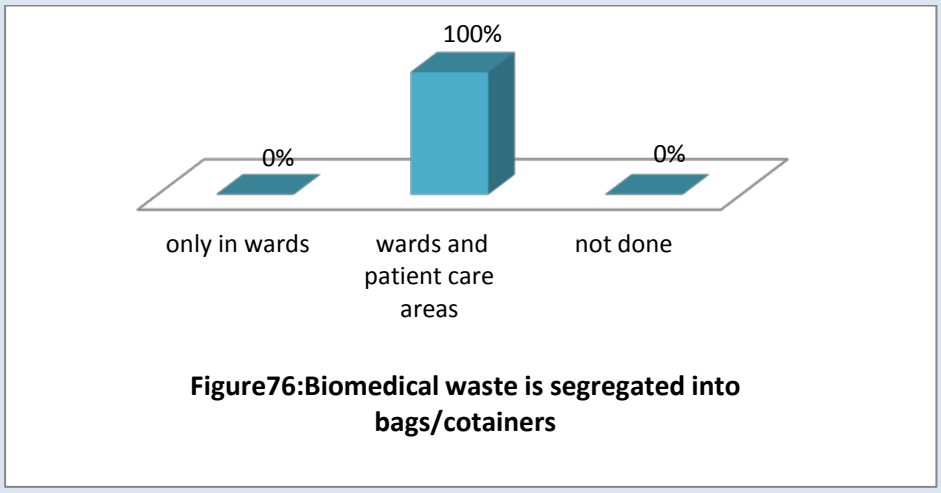


Figure76:Biomedical waste is segregated into bags/cotainers

(So it is 100% followed in all wards and patient care area)

- Color coding followed-

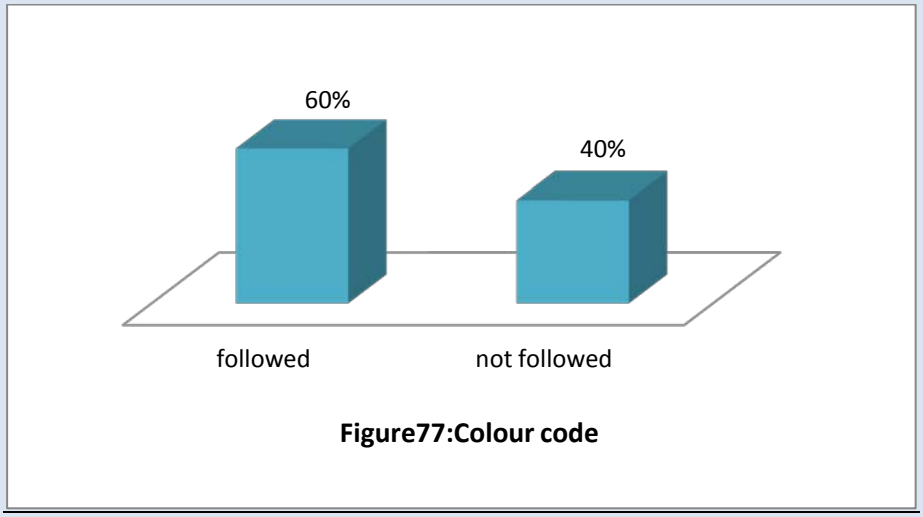


Figure77:Colour code

Under 15 days observation, it was seen that 60% times color code was followed but 40 % times it was not followed.New nursing students mostly do this mistakes .So ,they should trained before sending them to wards.

TRANSPORTATION

- Is the waste transported in closed 4-wheel trolley?

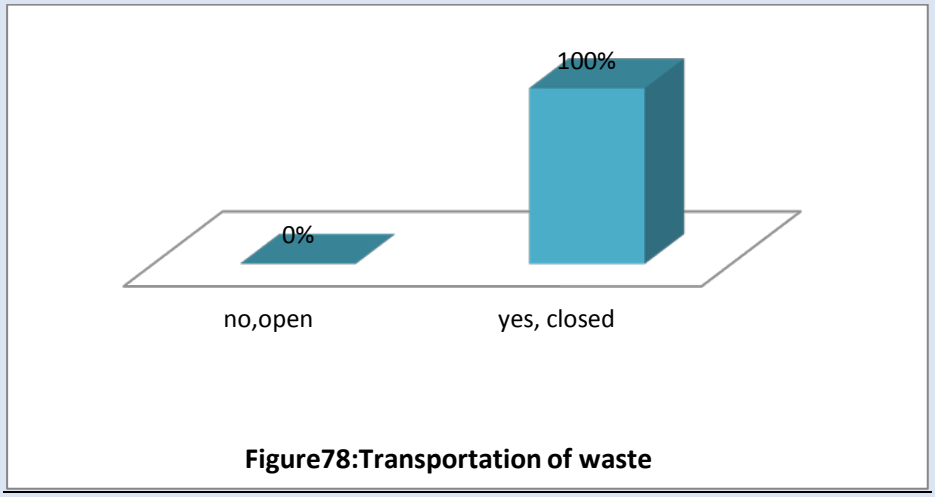


Figure78:Transportation of waste

During observation, it was seen that the waste is transported in close dustbins placed over 4- wheel trolley, which is also covered by a cloth.

It is followed regularly-100% followed by all staff

- Is staff aware of correct PPE and is following it accordingly?

Yes all staff is aware of the PPE to be used.

It is daily followed by staff but not *followed by* all staff mainly the *newly recruited staff.*

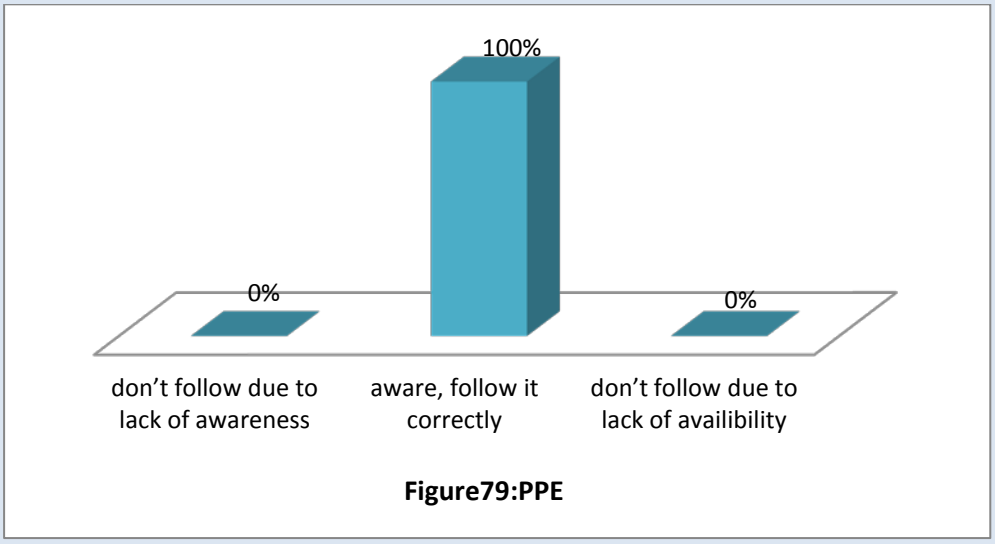


Figure79:PPE

STORAGE-

- Waste is stored for?

It is not stored more than 48 hours and the area is cleaned daily.

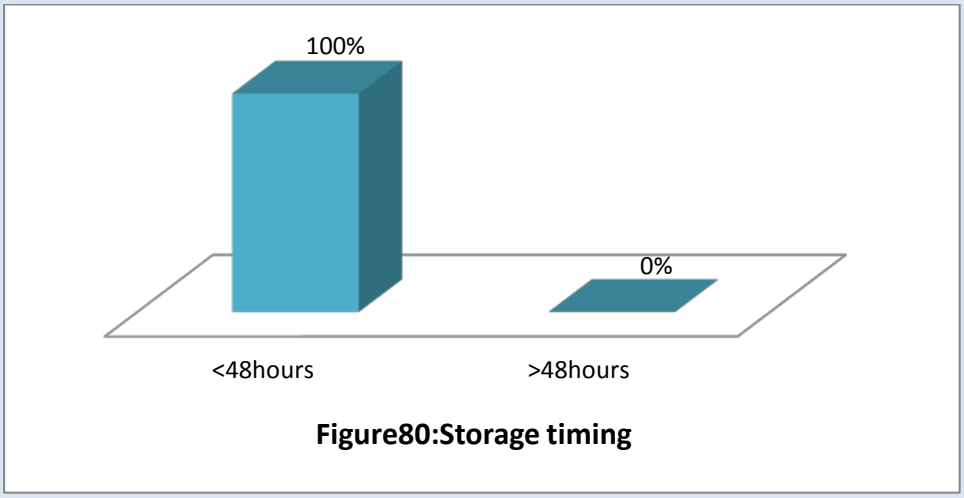


Figure80:Storage timing

Area- where the biomedical waste is stored is washed regularly with the help of hypochlorite solution.

- Containers and bags should be labeled(biohazard symbol)-

  Yes, the bags are labeled that is there is symbol of biohazard and the symbol is-

  Prominent
  Non-washable

- Records-

  There is maintenance of record of collection- which shows that from where the waste has been collected, and then it is weighted after the collection and noted as per the color coding.

4.KEY FINDINGS

Main findings were

1)22% of the staff is never trained for hand hygiene

2)43% have attended hand hygiene training only once

3) consumption of hand rub and soap is never monitored

4)healthcare workers are not washing their hands after touching every patient ,and sometimes not even after and before carrying invasive procedures.

5)staff is not attending training regularly.

6) Housekeeping staff which is most illiterate part of hospital employees ,they are not well informed about the practices need to be followed.

5. Recommendations

1. It was seen that 100% is completely aware about the infection control measures specially the hand hygiene but they lack in implementing their knowledge- due to lack of motivation, and due to lack of staff (unplanned holidays)
2. Surprise inspections on weekly basis for the practical implementation of hand hygiene and PPE should be done and staff should be made aware of their safety and patient safety during the inspection round.
3. The collected data can be analyzed and can be presented in the meetings before the management and grades can be issued to staff on basis of their knowledge and practical implementation.
4. On the basis of above two points staff can be awarded, titled as staff of month or can be promoted accordingly.
5. Training-

   Few staff does not attend training due to busy schedule, so training can be planned and staff names can be send a week ago so that their duties can be planned accordingly can they can attend their training

   Regular training should be planned which was found that it was not followed 100%.
6. There should be a regular monthly check for the PPE consumed and hand rub and soap so that it can be assessed that staff is using or not.
7. Packing of clean laundry can be done if it's cost effective for the hospital to avoid environmental infection.
8. During biomedical waste collection it can be recorded that which patient care area is not following the color code, which can be presented in meeting.
9. Stewards should be trained to ask the patient identity by asking the patient itself or the nursing staff

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6. Practical guidelines for infection control in health care facilities, world health organization,2003
7. WHO Guidelines on Hand Hygiene in Health Care: a Summary,2009, as seen on Arpil 2015.

7.ANNEXURE

List of activities carried out in the hospital:

Date	Departments
2/02/2015-2/03/2015	Observation of various departments of hospital and their working.
3/03/2015-04/4/2015	Preparation of questionnaire and checklist by studying on various guidelines for different patient care areas and department.
05/04/2015-21/04/2015	Interview and observation of the staff for the departments selected, and the nursing staff of ICU and wards. Observation of housekeeping and the biomedical waste department staff. Wherever possible cross –checking of records
22/04/2015-30/04/2015	Data analysis and Interpretations and preparation of report

ACRONYMS AND ABBREVIATIONS:

OT	Operation Theatre
ICU	Intensive Care unit(Medical, Surgical, Cardiac)
BMW	Biomedical waste
AC	Air conditioner
AHU	Air handling unit
PPE	Personal Protective Equipments
Pas	Pascal
NABH	National Accreditation Board for Hospitals and Healthcare
E.g.	For example
EtO	Ethylene Oxide
CSSD	Central Sterile Stores Department
CAUTI	Catheter-Associated Urinary Tract Infections
IV	Intravenous
Secs	Seconds
Rh	Relative Humidity

Questionnaire and checklists used:

How easily available is alcohol-based hand rubs in your health care facility?	i. Not available ii. Available only in some wards or in discontinuous supply (with efficacy1 and tolerability2 proven) iii. Available facility-wide with continuous supply(with efficacy1 and tolerability2 proven) iv. Available facility-wide with continuous supply, and at the point of care3 in the majority of wards(with efficacy1 and tolerability2 proven) v. Available facility-wide with continuous supply at each point of care3 (with efficacy1 and tolerability2 proven)
What is the sink: bed ratio?	i. Less than 1:10 ii. At least 1:10 in most wards iii. At least 1:10 facility-wide and 1:1 in isolation rooms and in intensive care units
Is there a continuous supply of clean, running water?	i. No ii. yes
Is soap available at each sink?	i. No ii. yes
Are single-use towels available at each sink?	i. No ii. yes
How frequently do health-care workers receive training regarding hand hygiene?	i. Never ii. At least once iii. Regular training for medical and nursing staff, or all professional categories (at least annually) iv. Mandatory training for all professional categories at commencement of employment, then ongoing regular training (at least annually).

Is a system in place to ensure that all health-care workers complete this training?	i. No ii. yes
Is a professional with adequate skills to serve as trainer for hand hygiene educational programs?	i. No ii. yes
Is health-care worker knowledge regarding indications and technique for hand hygiene assessed at least annually?	i. No ii. yes
Is consumption of alcohol-based hand rub monitored monthly (or at least every 3-5 months)?	i. No ii. yes
Is consumption of soap monitored monthly (or at least every 3-5 months)	i. No ii. yes
Indications for hand hygiene	Before handling medication or preparing food
	Wash hands when visibly dirty or visibly soiled with blood or other body fluids or after using the toilet
	Before and after touching the patient
	Before handling an invasive device for patient care, regardless of whether or not gloves are used
	After contact with body fluids or excretions, mucous membranes, non-intact skin, or wound dressings
	If moving from a contaminated body site to another body site during care of the same patient
	After contact with inanimate surfaces and objects (including medical equipment) in the immediate vicinity of the patient
	After removing sterile or non-sterile gloves
	Before leaving the patient care area
Use of gloves	i. Wear gloves when it can be reasonably anticipated that contact with blood or other potentially infectious materials, mucous membranes or non-intact skin will occur ii. Remove gloves after caring for a patient. Do not wear the same pair of gloves for the care of more than one patient iii. When wearing gloves, change or remove gloves during patient care if

	moving from a contaminated body site to either another body site within the same patient or the environment
Timing	i. Hand Hygiene Technique with Alcohol-Based Formulation(20-30secs) ii. Hand Hygiene Technique with Soap and Water(40-60secs)
SAFE INJECTION AND INFUSION PROCESS	i. Needles and syringes are used for only one patient ii. Rubber septum on a medication vial is disinfected with alcohol prior to piercing iii. medication vials are entered with new needle and a new syringe, even when obtaining additional doses for the same patient iv. single use medication vials, ampoules, and bags or bottles of IV solutions are used for only one patient v. medication administration tubing and connectors are used for only one patient vi. all sharps are disposed off in a puncture - resistant sharp container vii. single - use devices are discarded after use and not used for more than one patient viii. protocol for needle stick injury
CAUTI	
1. Insert catheters only for appropriate indications	i. acute urinary retention ii. measurement of urinary output(critical pts) iii. preoperative iv. pts with prolonged immobilization

	v. end life care comfort
2. leave catheter in place	i. <=24hours ii. >24hrs in max patients(>50%) iii. >24hrs(only in indicates patients)
3. hand hygiene	i. before insertion of catheter ii. after insertion of catheter iii. both(before and after insertion)
4. secure catheters	i. no ii. yes
5. replace catheter	i. disconnection ii. leakage
6. Maintain unobstructed urine flow	i. Keep catheter and collecting tube free from kinking ii. Keep collecting bag below level of bladder
7. Empty collecting bag	i. Regularly ii. Separate, clean container for each patient
8. Rest bag on floor	i. Yes ii. no
9. drainage spigot	i. contact non sterile container ii. do not contact non sterile container
CENTRAL LINE INFECTION	
1. Promptly remove unnecessary central lines	i. daily audits to assess whether each central line is still needed ii. daily audits not done to assess whether each central line is still needed
2. proper insertion practices	
3. hand hygiene	i. before insertion of catheter ii. after insertion of catheter iii. both(before and after

	insertion
4. sterile barrier precautions	i. mask ii. head cap iii. gown iv. sterile gloves v. sterile full body drape
5. skin antisepsis	i. done with >0.5% chlorhexidine with alcohol ii. not done
6. Cover the site with	i. sterile gauze ii. transparent, semi permeable dressings
7. Replace dressings that are	i. Wet ii. Soiled iii. dislodged
8. Perform dressing changes under aseptic technique using clean or sterile gloves	i. Yes ii. no
9. Scrubbing of the access port or hub immediately prior to each use with an appropriate antiseptic (e.g., chlorhexidine, povidone iodine, an iodophor, or 70% alcohol)	i. Yes ii. no
10. Provide recurring education sessions on central line insertion, handling and maintenance	i. Yes ii. no
CSSD	
1. PPE	i. staff is aware and follow ii. staff is not aware and thus not follow iii. staff is aware but not follow(lack of supply)
2. unidirectional flow	i. yes ii. no
It yes, then	i. staff follow ii. staff don't follow
3. clean patient-care items before high-level disinfection or sterilization procedures	i. manual ii. mechanical • ultrasonic cleaners

	• washer-disinfector • washer-sterilizers
4. Discard or repair equipment	i. no longer functions as intended ii. cannot be properly cleaned, and disinfected or sterilized iii. don't check
5. flash sterilization used for	i. convenience ii. alternative to purchasing additional instrument sets iii. to save time iv. patient-care items that will be used immediately v. Patient-care items that cannot be packaged, sterilized, and stored before use.
6. ETO sterilizer (aeration)	i. 12 hours at 50degC ii. 8 hours at 60degC iii. 8 hours at 50degC iv. 12 hours at 60degC
7. packaging material	i. Puncture resistant ii. Tear resistant
8. Monitoring of sterilizer(efficiency)	i. Mechanical ii. Chemical iii. biological monitors
9. mechanical monitors	i. time ii. temperature iii. pressure
10.if indicators suggest inadequate processing	i. use the processed items ii. do not use the processed items
11.biologic indicators used	i. weekly ii. <7 days iii. >7 days
12. items placed in basket/ cart/shelf	i. correctly loosely ii. close to each other iii. not specified
13. sterile storage area	i. well-ventilated ii. protection against dust, moisture,

	insects, and temperature and humidity extremes
14. Label sterilized items with	i. sterilizer used ii. the cycle or load number iii. the date of sterilization iv. the expiration date
15. Provide comprehensive and intensive training for all staff	i. induction ii. regular iii. both induction and then regularly
16.Is trainees supervised?	i. Yes ii. no
17. conduct competency testing	i. at beginning of employment ii. regularly- annually iii. at beginning of employment and thereafter regularly- annually
18. For each sterilization cycle, record the	i. type of sterilizer and cycle used ii. load identification number iii. the load contents iv. exposure parameters (e.g., time and temperature) v. operator's name or initials vi. results of mechanical, chemical, and biological monitoring
19. sterilization records	i. 1-2 years ii. >=3 years
BIOMEDICAL WASTE MANAGEMENT	
authorized by authority specified by govt	i. govt of state ii. union territory
shall be segregated into containers / bags	i. only in wards ii. wards and patient care areas
color coding followed	i. only in wards ii. wards and patient care areas iii. not followed
is the waste transported in closed 4-wheel trolley	i. no, open

	ii. yes, closed iii. not regularly followed(only 3-4 days followed)
Is staff aware of correct PPE and is following it accordingly?	i. don't follow due to lack of awareness ii. follow it correctly iii. don't follow due to lack of availability
Waste is stored for?	i. <48hours ii. >48hours iii. no records
Is the area cleaned after disposal of waste?	i. yes, daily ii. yes, not daily iii. monthly iv. no
vehicle should be authorized by competent authority(specified by govt)	i. yes ii. no
containers and bags should be labeled(biohazard symbol)	i. yes(non washable ,prominent) ii. yes(washable, prominent) iii. Yes(washable, non prominent) iv.
Records	i. Generation ii. collection
HOUSEKEEPING	
PPE-	i. staff is aware and follow ii. staff is not aware and thus not follow iii. staff is aware but not follow(lack of supply)
Clean housekeeping surfaces(table tops , floors)	i. regular basis ii. when spills occur iii. When these surfaces are visibly soiled.
Clean, when visibly contaminated or soiled in patient-care areas	i. walls ii. blinds

	iii. window curtains
replace floor mopping solution	i. every 3 patient rooms ii. every 5 patient rooms iii. after complete cleaning iv. nothing specified
Decontaminate mop heads and cleaning cloths	i. once daily(launder and dry) ii. alternate daily(launder and dry)
cleaning of non - porous floors	i. wet mopping ii. wet vacuuming iii. dry dusting
mop left after cleaning	i. soaking in dirty solution ii. wet iii. dry
disinfectants to clean infant bassinets and incubators while these items are occupied	i. use ii. don't use
chlorine solution	i. prepared freshly ii. not prepared freshly
if not prepared freshly then stored	i. room temp -30 days in opaque bottle ii. room temp> 30 days in opaque bottle iii. room temp-30 days clear bottle iv. nothing specified
Wet mopping	i. follow any motion ii. follow 8 motion
holding of handle	i. away from the body ii. close to the body
OPERATION THEATRE	
Occupancy- 5-8 persons at any given pt of time	
minimum total air changes	i. 30- superspecialty OT ii. 25- general OT
fresh air component of the air change	i. 05- superspecialty OT ii. 04- general OT

air velocity	i. Unidirectional ii. downwards on the OT table
positive pressure(15 Pas)	
HEPA filters	i. 8' * 6' (super specialty OT) ii. 6' * 4' (general OT)
exhaust grille (return air)	Located –approx. 6 inches above the floor level
temperature - 21 +/- 3 deg c	
humidity 40% - 60%	
ideal Rh - 55%	
Non functional hours, AHU blower will be operational round the clock	
window and split A/c should not be used	
flooring, walls and ceiling	i. Non-porous ii. Smooth iii. seamless without corners iv. easily cleanable repeatedly
periodic preventive maintenance	
cleaning of pre-filters in 15 days	
LAUNDRY	i. unidirectional ii. Segregation of clothes into spoiled and infected clothes at laundry and not at work place iii. Maintenance of right temperature(65 ^{0}C) iv. Receiving area- negative air pressure v. sorting laundry at dirty area- needles, syringes, and patients property vi. Damn textiles should not be kept overnight vii. Packing is done before transferring viii. drainage- open pit then should be covered / closed pipe ix. linen change policy x. different washing protocols

	soiled linen infected linen blankets OT clothes xi. Clean linen should be stored in a dry area above the floor level.
F&B(KITCHEN)	1. Is gloves worn while making food and serving food? 2. jewelry to minimum 3. nails short and clean 4. Does milk n milk products and all open products stored at right temp and used within time? 5. Is labeling of food item-time of preparation and time till it can be used is done? 6. food brought on same day cooked and served one day before ,cooked and served > 1 day 7. fridge temp 1-2 times a day 2-3 times a day >3 times a day Not recorded 8. food temp maintained 63deg c - hot food 5 deg c or less - cold food 9. Is food tasted before dispatch? 10. Is food packed before dispatch? 11. Is special precautions taken for infected patients (HIV, skin diseases, boils, burns)? 12. Is patient identity checked before serving the food? 13. visitors not allowed