# Study on Healthcare Associated Infections Management in I.C.U.

***By***

*Kirti Aggarwal*

*Dissertation submitted for the partial fulfillment of the*

*MBA Hospital and Health Management*

*Academic year, 2015-2017*

**The IIHMR University, Jaipur**

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IIHMR UNIVERSITY

**TO WHOMSOEVER MAY CONCERN**

This is to certify that **Dr.Kirti Aggarwal** student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone internship training at **Sarvodaya Hospital** from 6th Feb, 2017to 6th May, 2017

The Candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical.
The Internship is in fulfillment of the course requirements.

I wish her all success in all his future endeavors.

Dean, Academics and Student Affairs
The IIHMR University, Jaipur

Professor
The IIHMR University, Jaipur



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sarvodaya
HOSPITAL AND RESEARCH CENTRE

CELEBRATING 25 Years

## DESSERTATION CERTIFICATE

The certificate is awarded to **Miss Kirti Aggarwal** in recognition of having successfully completed her internship in the department of **"Medical Administration"** under the guidance of Dr. Saurabh Gahlote (Medical Administrator) on the topic **"A Study on Health Care Associated Infections Mangement in an Intensive Care Unit (ICU)"** at Sarvodaya Hospital & Research Centre, Sector – 8 Faridabad.

She has undergone 3 months dessertation from 6th February, 2017 to 6th may, 2017.

We wish her all the best for future endeavours.

**Dr. Saurabh Gahlote**
**Medical Administrator**
Sarvodaya Hospital, Sector- 8
Faridabad

## THE IIHMR UNIVERSITY, JAIPUR

## CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled "**A Study on Awareness of Healthcare Associated Infections Management in an ICU**" and submitted by **Dr. Kirti Aggarwal** Enrollment No **IIHMR-U/01/2015-17/0295** under the supervision of **Dr Alok Mathur** for award of MBA in Hospital Management of the University carried out during the period from **February 06, 2017 to May 06, 2017** 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.

Kirti Aggarwal

Signature

**THE IIHMR UNIVERSITY, JAIPUR**

**CERTIFICATE BY SCHOLAR**

This is to certify that all ethical issues have been considered while collecting data for my dissertation titled " A Study on Awareness of Healthcare Associated Infections Management in an ICU"

Kriti Aggarwal

Signature of student

# DECLARATION

I do hereby declare that I am a student of MBA in Hospital and Healthcare Management, IIHMR University, Jaipur, Rajasthan session 2015-2017.

I would like to state that I have carried out my Dessertation on the topic "A study on Health care Associated Infections Management in ICU's" under the guidance of Dr. Saurabh Gahlote (Medical Administrator) at Sarvodaya Hospital, Sector- 8, Faridabad for the fulfilment for the degree of MBA in Hospital and Healthcare Administration.

This project work is my own and has not been submitted to any of the other Institute or University for the purpose of award of any degree or diploma.

Dr.Kirti Aggarwal

IIHMR University

(2015-2017)

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# INTRODUCTION

Patients in intensive care units (ICUs) have more chances to acquire Health care associated infections (HAIs) as compared to those in non-critical care areas. ICU-acquired infection rate is five to ten times higher than hospital-acquired infection rates in general ward patients.

"Due to this, mortality and morbidity is considerably higher in ICU patients.This results in prolonged hospital stay, immune-suppression, increased use of antibiotics and frequent exposure to therapeutic procedures like endotracheal intubation with mechanical ventilation, nasotracheal intubation, intravenous lines, central venous line, arterial lines and urinary catheterization. The most common Hospital Acquired Infection (HAI) in Intensive Care Unit patients are respiratory tract infections (RTIs), urinary tract infections (UTIs) and bloodstream infections (BSIs) and are most often associated with the use of invasive devices. The Intensive Care unit are an area of considerable antibiotic use in which antibiotic-resistant organisms are prevalent". Their prevalence and rates of resistance can vary enormously depending on geographic location as well as location among ICU types. It is necessary to have updated knowledge about incidence and prevalence of the causative agents and their antimicrobial susceptibility patterns and updating with the latest technology for the management of nosocomial infections. The study aims to review the knowledge among the staff at Sarvodaya hospital about the nosocomial infection and policies followed to encounter them and measures that can be taken to attain minimum level of Hospital Acquired Infections.

## Types of Health Care Associated Infections

"The four most common types of nosocomial infections are catheter associated urinary tract infections(CAUTI), surgical site infection(SSI), ventilator associated pneumonia (VAP) and central line associated blood stream infections(CLABSI)". The most common is urinary tract infection. Eighty percent of these infections are associated with the use of an indwelling catheter. They are associated with less suffering than other infections but can sometimes lead to septicemia and death. Surgical infections are also frequent with an incidence varying from 0.5% to 15% depending on the type of surgery and the underlying patient status – " A surgical infection is indicated by the presence of purulent discharge around the wound or the insertion site of a drain, or by the presence of cellulites which is emanating from the wound.

Nosocomial pneumonia is one of the significant problem. The patients on ventilator acquire pneumonia which is around 3%. The source of the microorganism is mainly endogenous but may also be

exogenous with transfer of an organism from the respiratory equipment. There are several studies for the reduction of nosocomial infections and one successful example is of the "**Owensboro Medical Health System** who was able to reduce their rate of VAP in the ICU to zero for eight months. They implemented the Ventilator Bundle, a series of interventions related to ventilator care. The main interventions include elevation of the head of the bed, assessment of the readiness for extubation after intubation, daily "sedation" vacations, peptic ulcer prophylaxis, and deep vein thrombosis .The Owensboro team particularly noted the importance of elevating the head of the bed, citing an observed association of inability to elevate the head of the bed due to clinical condition and VAP. The team also noted the importance of getting "buy-in" from the nursing staff, making changes as easy as possible for the nursing staff, teaching new staff members the importance of the ventilator bundle, identifying a physician champion of the intervention, and remembering that cultural changes take time. Besides ventilator-associated pneumonia, there are also problems with viral bronchiolitis in children's units and influenza with secondary bacterial pneumonia in institutions for the elderly".

# REVIEW OF LITERATURE

The World Health Organization offers several definitions of a nosocomial infection/ healthcare –associated infection:

> "An infection acquired in a hospital by a patient who was admitted for a reason other than that infection / an infection occurring in a patient in a hospital or other health care facility in whom the infection 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 of the facility."

As a general timeline, "infections occurring more than 48 hours after admission are usually considered nosocomial. Nosocomial infections are also divided into two classes, endemic or epidemic. Most are endemic, meaning that they are at the level of usual occurrence within the setting. Epidemic infections occur when there is an unusual increase in infection above baseline for a specific infection or organism."

"Nosocomial infections occur worldwide, both in the developed and developing world. They are a significant burden to patients and public health. They are a major cause of death and increased morbidity in hospitalized patients. They may cause increased functional disability and emotional stress and may lead to conditions that reduce quality of life. Not only do they affect the general health of patients, but they add a huge burden financially. The greatest contributors are costs due to increased stays of patients with nosocomial infections. The increased length of stay varies from 3 days for gynecological procedures to 19.8 days for orthopaedic procedures. Other costs include additional drugs, the need for isolation, and the use of additional studies. There are also indirect costs due to loss of work."

"Nosocomial infections are most frequently infections of the urinary tract, surgical wounds, and the lower respiratory tract. A World Health Organization prevalence study and other studies have shown that these infections most commonly occur in intensive care units and in acute surgical and orthopaedic wards. Infection rates are also higher in patients with increased susceptibility due to old age, underlying disease, or chemotherapy".

"Patients are exposed to a variety of microorganisms during a hospital stay, but contact between a patient and an organism does not necessarily guarantee infection. Other factors influence the nature and frequency of infections. Organisms vary in resistance to antimicrobials and in intrinsic virulence. Bacteria, viruses, fungi, and parasites can all cause nosocomial infections. There are multiple ways of acquiring such an organism. The organisms can be transferred from one patient to another (cross-infection). They can be part of a patient's own flora (endogenous infection). They can be transferred from an inanimate object or from a substance recently contaminated by another human source (environmental transfer).

The organisms that cause nosocomial infections are often drug-resistant. The regular use of antimicrobials for treatment therapy or prophylaxis promotes the development of resistance. Through antimicrobial-driven selection and the exchange of genetic resistance elements, multi-drug resistant strains of bacteria emerge. Antimicrobial-sensitive microorganisms that are part of the endogenous flora are suppressed, while the resistant strains survive. Many strains of pneumococci, staphylococci, enterococci, and tuberculosis are currently resistant to most or all antimicrobials which were once effective."

## Methods of Acquisition

"Bacteria that cause nosocomial infections can be acquired in several ways. Endogenous infections can develop from the endogenous or transient flora of the patient. When bacteria present in the normal flora are transmitted to sites outside of their normal environment like the urinary tract, they can cause infection. Infection can also occur with tissue damage (wound) or with inappropriate antibiotic therapy that allows overgrowth of endogenous bacteria like *C. difficile.* Exogenous cross-infection can occur with transfer of an organism from one patient or member of the staff to another patient or member of staff". The WHO guide summarizes this idea with the following statement:

> ""Bacteria are transmitted between patients: (a) through direct contact between patients hands, saliva droplets or other body fluids), (b) in the air (droplets or dust contaminated by a patient's bacteria), (c) via staff contaminated through patient care (hands, clothes, nose and throat) who become transient or permanent carriers, subsequently transmitting bacteria to other patients by direct contact during care, (d) via objects contaminated by the patient (including equipment), the staff's hands, visitors or other environmental sources (e.g. water, other fluids, food)."

"A final route of acquisition is through flora from the healthcare environment. Certain microorganisms do well in the hospital environment. They may live in water, in damp areas, in sterile products or disinfectants (*Pseudomonas, Acinetobacter, Mycobacterium*), in linens, in food, in fine dust and droplet nuclei, and in equipment and supplies used in care."

People are central to all of these routes of transmission. They are the main reservoir and source for microorganisms. They are the main transmitters of organisms, and they are the receptors of organisms, in consequence becoming new reservoirs.

"Some strains of methicillin-resistant *Staphylococcus aureus* are particularly capable of causing nosocomial infections. These strains are often resistant to multiple antibiotics and sometimes are only sensitive to vancomycin and teicoplanin. Infections caused by MRSA are similar to those caused by methicillin sensitive strains (wound infections, lower respiratory and urinary tract infections, septicemia, infections of sites for invasive devices, pressures sores, burns and ulcers. MRSA has the potential for epidemic spread, regionally and nationally. Vancomycin resistant enterococci are also known causes of nosocomial infections".

**The Societal Impact of Healthcare associated Infections**

" One study estimates that bloodstream nosocomial infections are the eighth leading cause of death, assuming a nosocomial infection rate of 5%, of which 10% are bloodstream infections, and an attributable mortality rate of 15%. In absolute numbers, if the overall attack rate was 5%, and 25 million patients were admitted each year, 1.75 million people would acquire nosocomial infections each year. If 10% of these were bloodstream infections, 175,000 would get these serious infections each year. If the attributable mortality rate of nosocomial infections is 20% and the infection rate is 5%, an estimated 350,000 life years would be lost annually. Another source reports an incidence of 2 million new cases of nosocomial infections per year, leading to an estimated 20,000 deaths per year. They also estimate that nosocomial infections more than double the mortality and morbidity risks of any patient admitted to a hospital.The costs to society can also be studied in terms of dollars spent. Assuming an incidence of 2 million nosocomial infections per year, the estimated added expenditure is in excess of $2,000,000,000 per year. One study showed that length of stay for a patient with a*Staphylococcus aureus* infection was increased by nearly three times the average length of stay for any other type of hospitalization. This increased length of stay also means increased costs. Treating a*methicillin-resistant Staphylococcus aureus* (MRSA) infection costs 6-10% more than treating a *S. aureus* infection that is sensitive to methicillin (MSSA). Patients with MRSA infections also have a higher attributable death rate than MSSA patients. These statistics support the argument for increasing efforts to reduce the incidence of hospital-acquired infections so that the associated societal costs will also be reduced".

As a public health problem, nosocomial infections will become increasingly important in the future. Crowding and population size are increasing, and impaired immunity is becoming more frequent. New microorganisms will develop, and existing microorganism will develop even greater resistance.

## Specific Infection Control Measures

"Besides the committees and other leaders in infection control, much of infection control lies in the hands of the personnel in direct contact with the sick patient. These healthcare employees must understand specific guidelines in prevention of infection transmission through isolation and other good healthcare habits. Much of

this information in disseminated through training and educational programs given by the infection control departments". Examples of guidelines that are essential for the healthcare worker are specified as:

**Hand Washing**

"Though simple, this measure is one of the most effective methods in prevention of the spread of infection. Depending on the type of care being provided there is a different hand-washing protocol indicates. For example, with routine care in the hospital, healthcare workers can wash with a non-antiseptic soup or to disinfect the hand by rubbing with an alcohol solution. However, when caring for patients who are already suffering infection, hands must be washed with antiseptic soap for at least one minute or hands can be disinfected by rubbing with alcohol solution. Finally, in the surgical setting, the hand and forearm must be washed with an antiseptic soap for 3 to 5 minutes or simple hand washing with the addition of disinfection by rubbing on alcohol".

## Hygiene and Uniform

"Healthcare workers must also be conscious of their personal hygiene and what they wear to work as it could help spread infection within the hospital. For example, employees must have good personal hygiene, maintain short and clean nails, and keep hair worn short or pinned up. Also, employees should wear a uniform that is covered by a white coat and must obey special uniform rules in setting such as burn or intensive care units. Clothing must also be easy to decontaminate and cleaned daily to keep at optimum conditions. It is important that with any exposure to a possible pathogen, clothing should be changed as soon as possible. Shoes are another measure of safety in the healthcare system. Staff should wear shoes that are dedicated to the particular unit and make sure that the shoes have been cleaned".

## Barriers: Caps, Masks, Gloves

"Another important group of precautions to prevent the spread of infection is the use of barriers such as caps, masks, and gloves. In general, caps are suggested when in aseptic units, operating rooms, or when performing other invasive procedures. Masks that are made of synthetic material that can filter the air are considered good barriers against microorganisms. Masks made of other material such as wool, gauze, or paper is not considered effective. The use of masks is indicated for many situations and is present for both the protection of the patient and the healthcare worker. Gloves are another set of necessary barrier when working with patients with a communicable disease. Staff should wear non-sterile gloves when caring for this type of patient while when working in surgery or immuno-compromised patients, gloves used should be sterile. Again, gloves are used for protection of both the patient and healthcare provider".

## Injection Practices

"Transmission of blood borne pathogens is often the result of unsafe injection methods. It is recommended that all staff is aware that they should decrease unnecessary injections, to always use a sterile needle and syringe, and to dispose of the used needle and syringe in an appropriate manner, i.e. the use of a sharps container and biohazard disposals".

## Equipment Safety

"Another common mode of transmission of infection is through equipment and environmental causes. Though it may appeal to common sense, it is necessary that the hospital environment is thoroughly cleaned often. The hospital can be divided into four zones where different cleaning procedures can be followed. In zone A, there are no patients in this area and normal cleaning can be used. In zone B, patients are present but do not have an infection nor are susceptible to infection. Zone B should be cleaned in a manner that does not raise dust and a detergent solution may be used to improve the cleaning. In zone C, patients are infected and isolated and in zone D, patients are often highly susceptible to infection and are isolated. These areas must be cleaned with a detergent or antiseptic solution and different cleaning equipment must be used for different rooms. Another important way to keep the equipment and environment safe is to disinfect through the use of other compounds than those used for cleaning. These compounds are usually non-volatile, remain safe for the patient and staff, and should be effective for a short time frame. Disinfection can be categorized as high, intermediate, or low. Under high-level disinfection, all microorganisms should be eliminated with the exception of heavy bacterial spore counts. Under intermediate disinfection, most bacteria and viruses are killed but not all spores are killed. Finally, in low-level disinfection, only some microorganisms are killed with some more resistant species escaping destruction. One last way to ensure equipment safety is sterilization, which is destruction of all microorganisms. Sterilization can be achieved through both mechanical and chemical processes. While equipment and device disinfection and sterilization are critical, it is also crucial that all personnel are trained properly in the use of the equipment and device and know contacts for any malfunctions in such equipment".

## Isolation

“While all of the infection control methods deal with physical objects, isolation of the patient also plays a critical role in infection control. The isolation of an infected patient can often prevent the spread of disease and also protect the patient from acquisition of other infections. Isolation policy may vary slightly between hospitals but patient are usually evaluated before being placed under isolation”.

**Surveillance and Infection Control**

“Surveillance has been instituted for many years since the rise of nosocomial infections in the United States. A majority of hospitals have their own surveillance systems and some hospitals voluntarily report their findings to the CDC and the NNIS report is written to give other hospitals an idea of how well their infection control systems are working.”

# RATIONALE

This report is indented to find out the various nosocomial infections encountered in ICU’s in Sarvodaya Hospital, Faridabad as Nosocomial infections is one of the major contributing factors that adds to the cost of patients and major cause of mortality and morbidity in patients leading to increase in average length of stay and adds to cost in maintenance for the hospital as well.Reducing the nosocomial infection in ICU’s can lead to increase in significantly enhancing the hospital’s image.

Establishing a standard protocol procedure for controlling the nosocomial infections in ICU’s will help in promoting efficiency amongst the employees and helps in establishing a significant position of the hospital amongst competitors.

## OBJECTIVES

1. To observe and analyze the various infection control practices followed at Sarvodaya Hospital, Faridabad.

2. To search for areas of problem and find reasons for the same.

## METHODOLOGY

- ***Type of study :*** Descriptive
- ***Study population*** : Doctors, Nurses in ICU'S at SarvodayaHospital, Faridabad
- ***Study area*** - All ICU's at Sarvodaya Hospital, Faridabad
- ***Duration of Study***– 3 months (12 weeks)
- ***Type of Data*** - Quantitative
- ***Technique*** – personally distributed to everybody and requested them to fill in front of the reseracher
- ***Tool*** –Questionnaire
- ***Sample size*** –95(covered all the doctors and nurses were covered.)
- ***Data*** -Primary
- ***Data entry***- excel sheet
- ***Data Analysis***- excel sheet

# OBSERVATIONS AND FINDINGS

**HOSPITAL INFECTION CONTROL**

**1. Sarvodaya Hospital has a well-designed, comprehensive and documented infection control programme aimed at reducing/eliminating risks to patients and their attendants, visitors and the health care providers:**

a) Currently there is a hospital infection control committee on infection control the meeting of which is held every month.

b) There is a documented infection control programme.

c) There is an infection control task force which is involved in surveillance activities.

d) There are designated infection control nurses.

**2. The organization has an infection control policy which is periodically updated:**

a) There is infection control manual. It has all policies and procedures related to infection control activities in thehospital and identify high risk areas in the same.

b) Even though surveillance activities like swab culture is done in various areas like OT & ICU there is a need ofstrengthening the surveillance activities by including rounds, air and water quality checks in high risk areas like CSSD& kitchen.

c) Policies and procedures related to CSSD activities must be prepared and included in the manual.

**3. The infection control committee is responsible for surveillance activities in identified areas of the hospital**

a) There is data collected on surveillance activities. The infection control nurse maintains the surveillance data oninfection control.

b) This is being uniformly done.Information is sent to appropriate authorities.

d) Monitoring the effectiveness of housekeeping services (infection control) is being done.

**4. The organization takes actions to prevent reduce the risk of HealthCare Associated Infections (HCAI's) in patientsand employees.**

**5. Proper facilities and adequate resources are provided to support the infection control programme**

a) Hand washing facility is adequate. Scrubs are provided with elbow/foot operating tap. Also drier/tissue papers are provided. Hand washing pictures are displayed. Also hand washing areas are kept clean.

b) Hand washing should are monitored regularly.

c) Policies and procedures on isolation and barrier are available. Staffs are aware of isolation/barrier activities, who arethe patients to be admitted in isolation room. Isolation rooms are available in wards. These rooms are more organizedand cleaned. They are displayed "ISOLATED ROOM".
d) Adequate gloves, masks and disinfectants are available. The usage must be monitored by infection control team.

**6. The organization takes necessary actions to control infection outbreak.**
Hospital has documented procedures on handling such outbreaks. It is prepared and implemented.

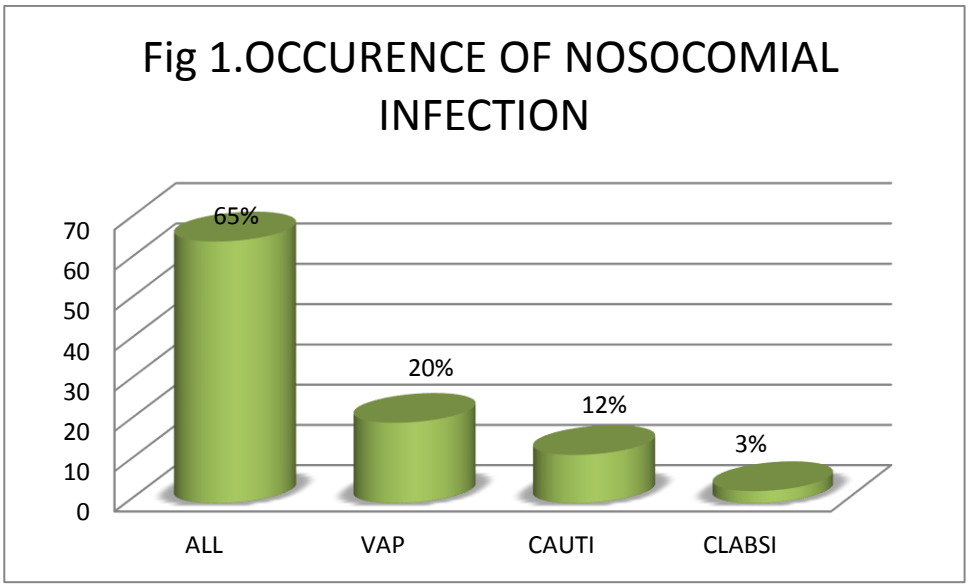
**7. Sterilization is as per the documented procedures and protocols are followed in the intensive care units in the organization**
There is an established documented procedure.

**8. Statutory provisions with regard to Bio Medical Wastes (BMW) are complied with**
a) The hospital is authorized by
b) Biomedical waste segregation is done with the help of colour codes and instructions are properly displayed in waste segregation areas. This is displayed uniformly throughout the hospital.
c) The waste is cleared at least twice in a day. Trolleys are used with covered bins of different colour to transport waste.
d) All the wastes must be weighed before handling over to the outsourcing service.
e) Bio-medical waste treatment is outsourced which is authorized to treat biomedical waste.

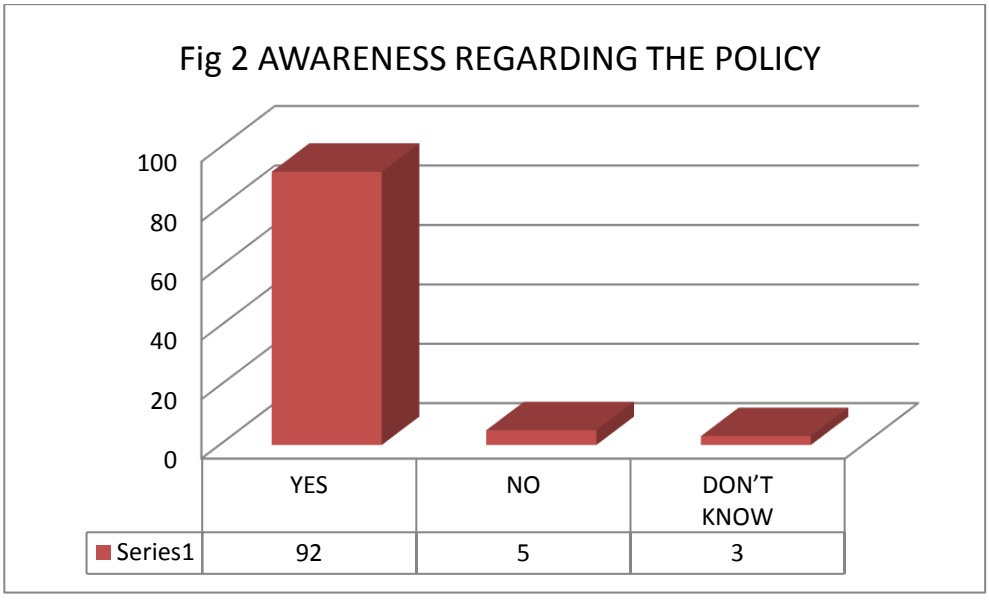
**9. The infection control programme under infection control committee is supported by the organization's management that includes training of staffs and employee health**
a) Designated infection control nurses are there.
b) Facilities like gloves, mask etc is available.
d) Soap solutions are provided in all hand washing areas instead of soap
f) Proper system of pre and post exposure prophylaxis is implemented throughout the organization. This must be applicable to all staffs working in the organization including outsourced services.

# DATA ANALYSIS

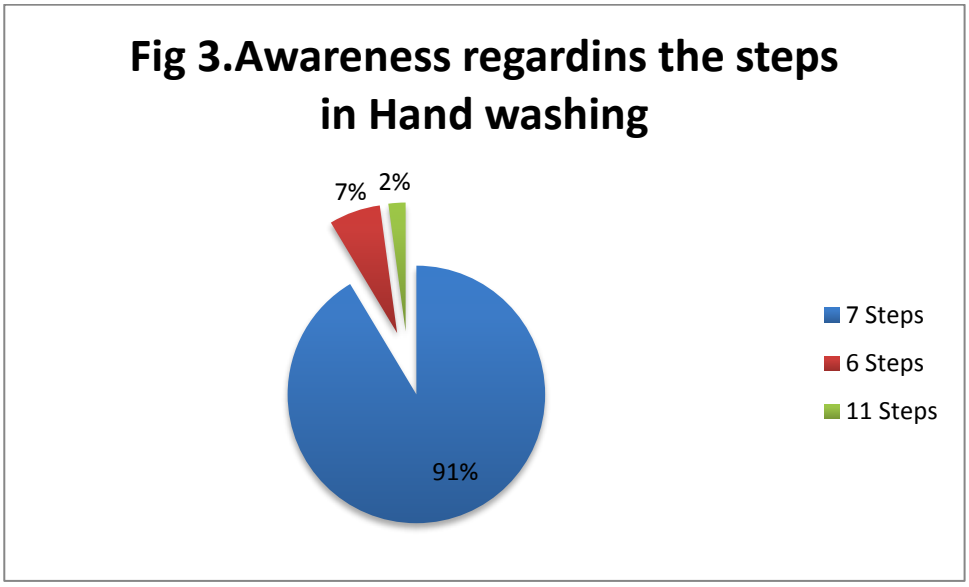
## NURSE Analysis



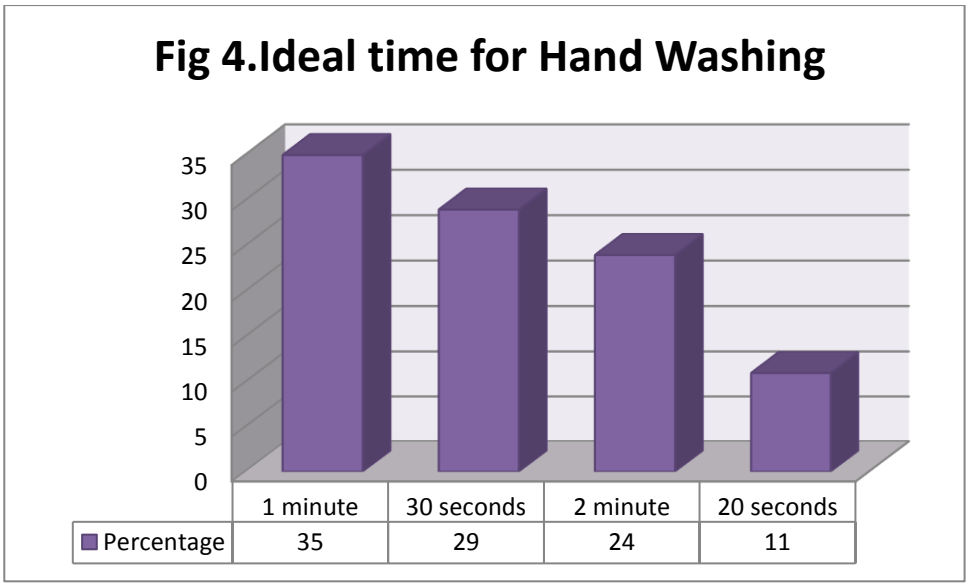

**INFERENCE**: The figure 1 reveals that 65% of the Nurses agreed that all the nosocomial infections such as Ventilator Associated Pneumonia (VAP), Methicillin Resistant Staphylococcus aureus (MRSA), Catheter Associated Urinary Tract Infection (CAUTI), Center Line Associated Blood Stream Infections (CLABSI) occur at Sarvodaya Hospital.



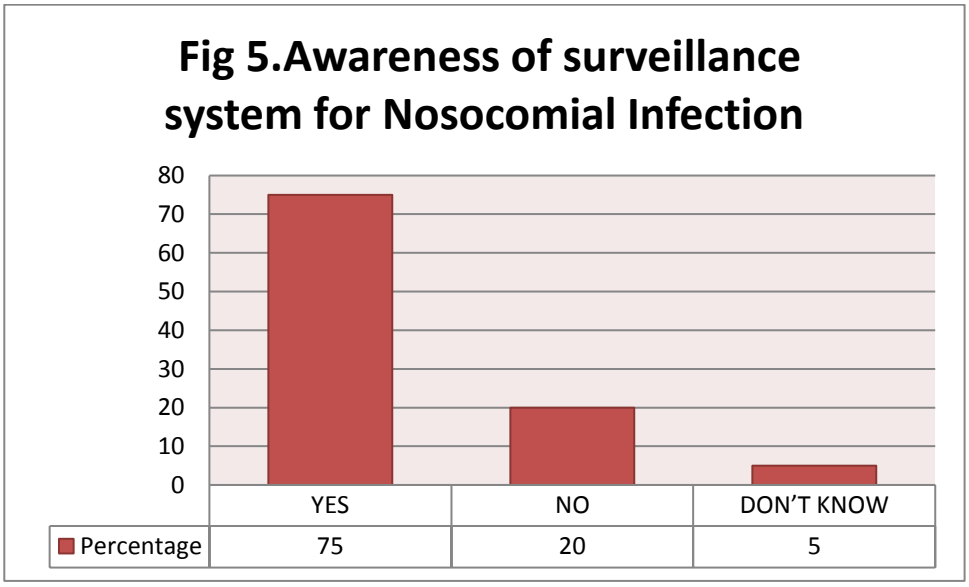

**INFERENCE**: The figure 2 depicts that**92%** of the Intensive Care Units are aware about the policy regarding Nosocomial Infection in the Hospital.



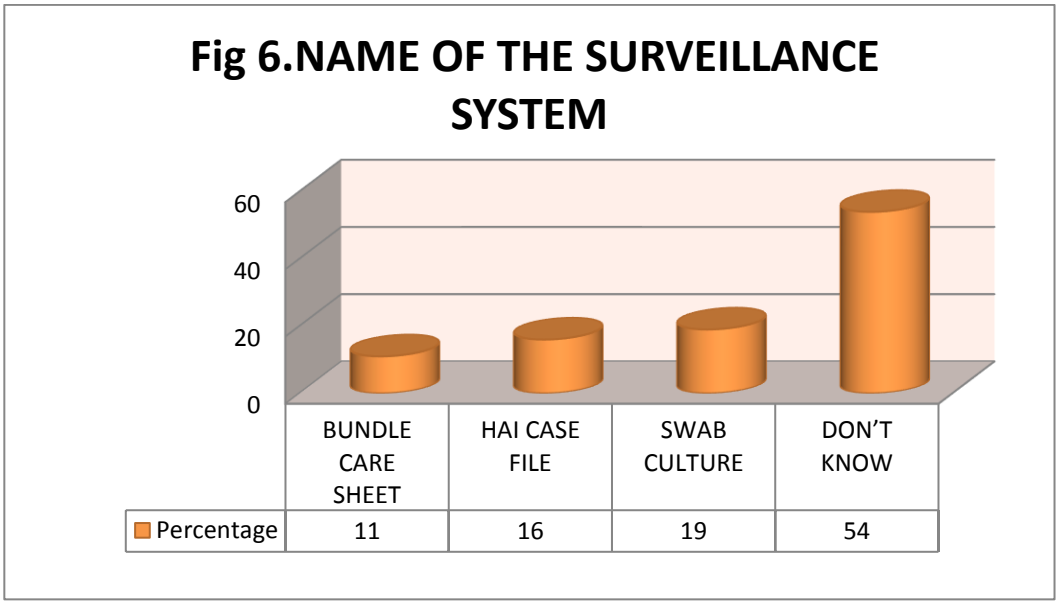

**INFERENCE**: The figure 3 clearly shows that**91%**of the Intensive Care Unit Nurses are aware of the 7 steps followed in Hand Washing Practices.**7%** Nurses feel there are 6 steps followed by 5% who feel there are 11 steps.



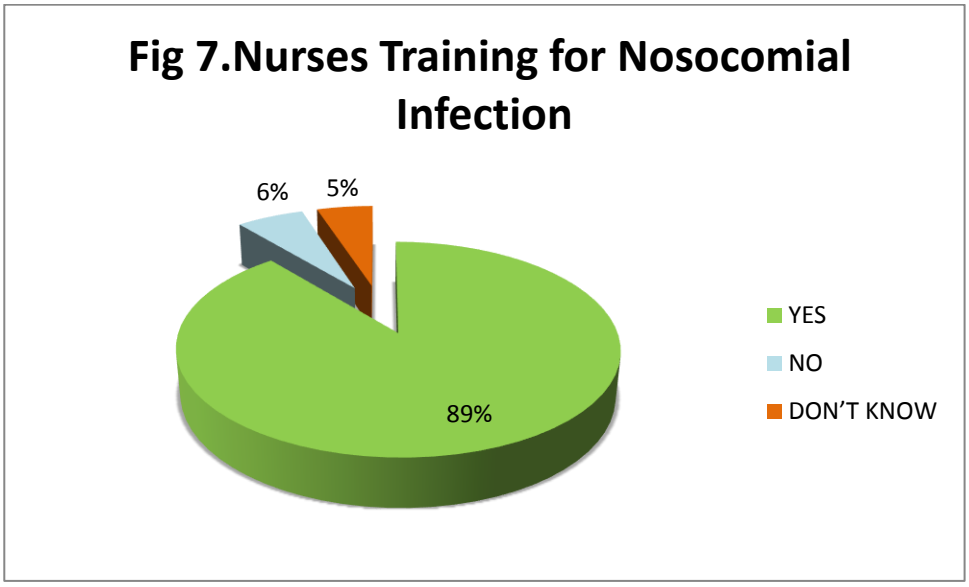

**INFERENCE**: The figure 4 clearly depicts that **35%** of the Intensive Care Unit Nurses knew about the ideal time followed by **29%** who feel 30 seconds to be the ideal time followed by **24%** who feel 2 minute to be the ideal time.



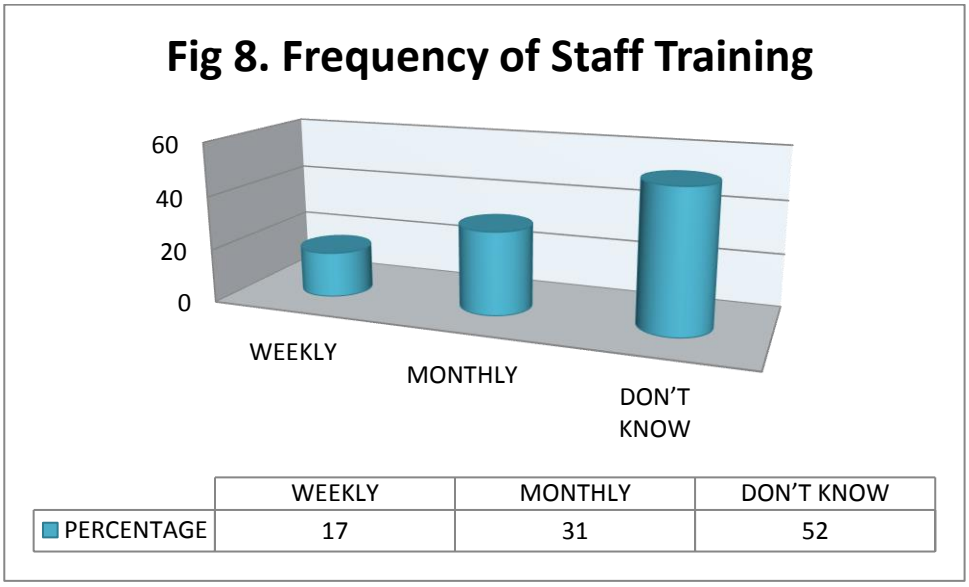

**INFERENCE:The Figure 5 clearly shows that75%of the Intensive Care Unit Nurses were aware about the surveillance system for nosocomial infections that monitors the incidence of nosocomial infections.**



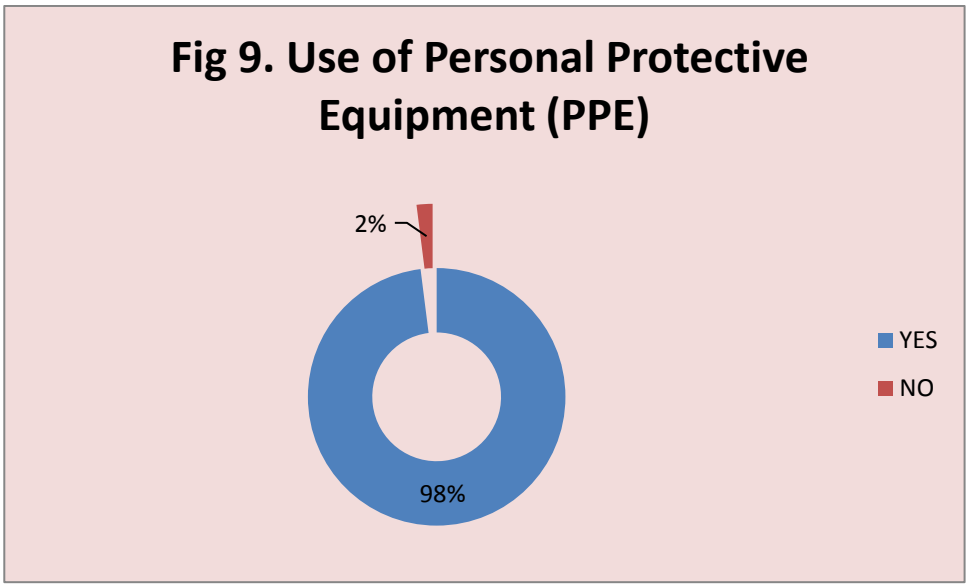

**INFERENCE:The figure 6 clearly shows that only54 %of the Intensive Care Unit Nurses were not aware about the Surveillance System maintained by the Hospital followed by 19% who thinks that swab culture is one of the system.**



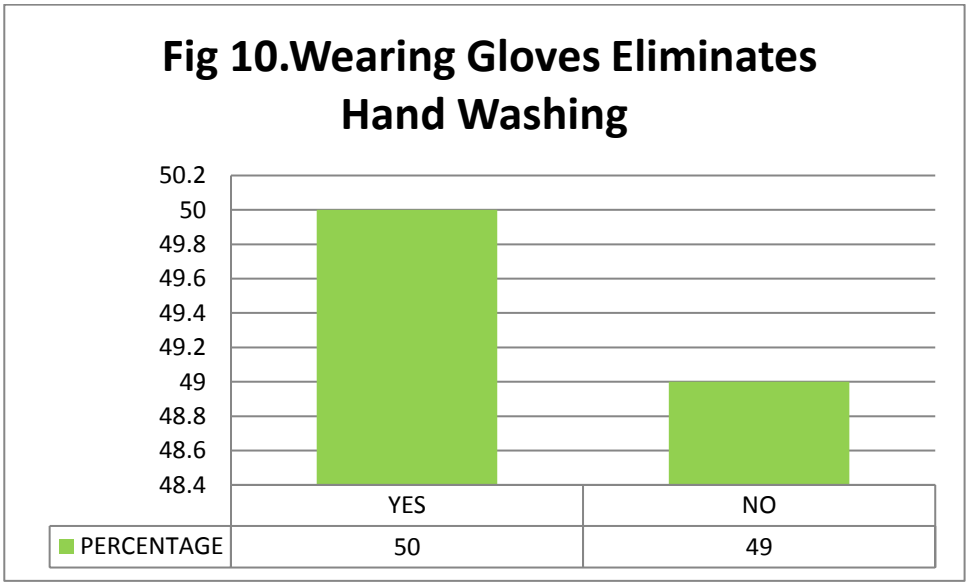

**INFERENCE:The figure 7 clearly reveals that 89% of the Intensive Care Unit Nurses agreed that they receive training for nosocomial infection.**



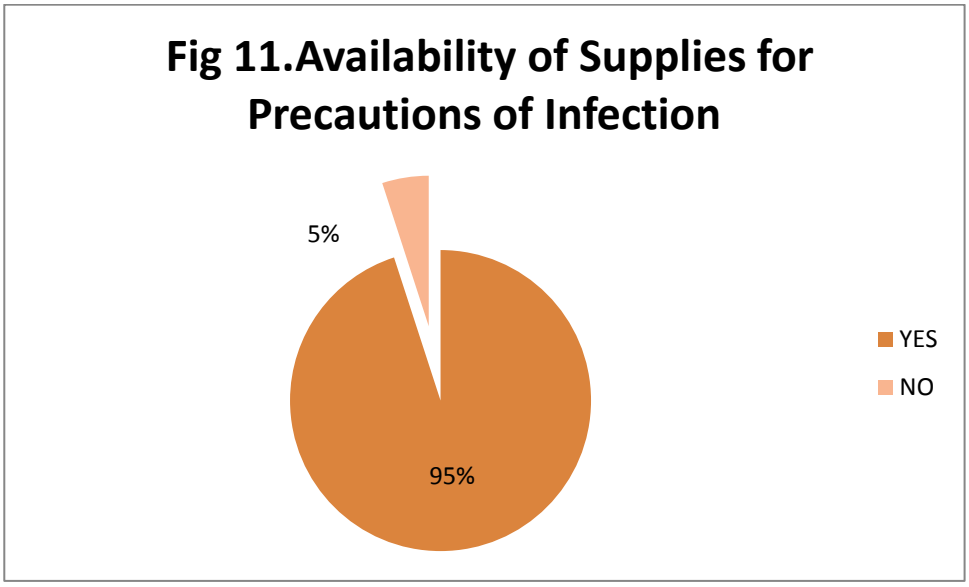

**INFERENCE:The figure 8 clearly shows that only 31%of the Intensive Care Unit Nurses said that they receive training for nosocomial infection once a month.**



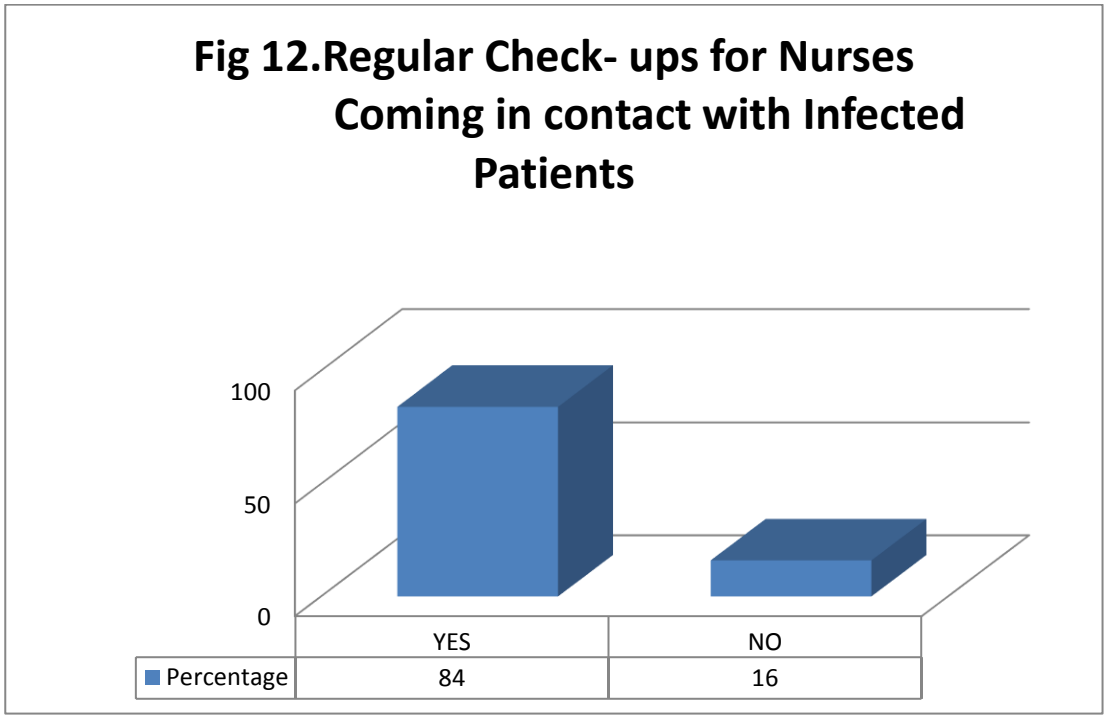

**INFERENCE:The figure 9 clearly shows that almost all the Intensive Care Unit Nurses use Personal Protective Equipment while attending Nosocomial Patients.**



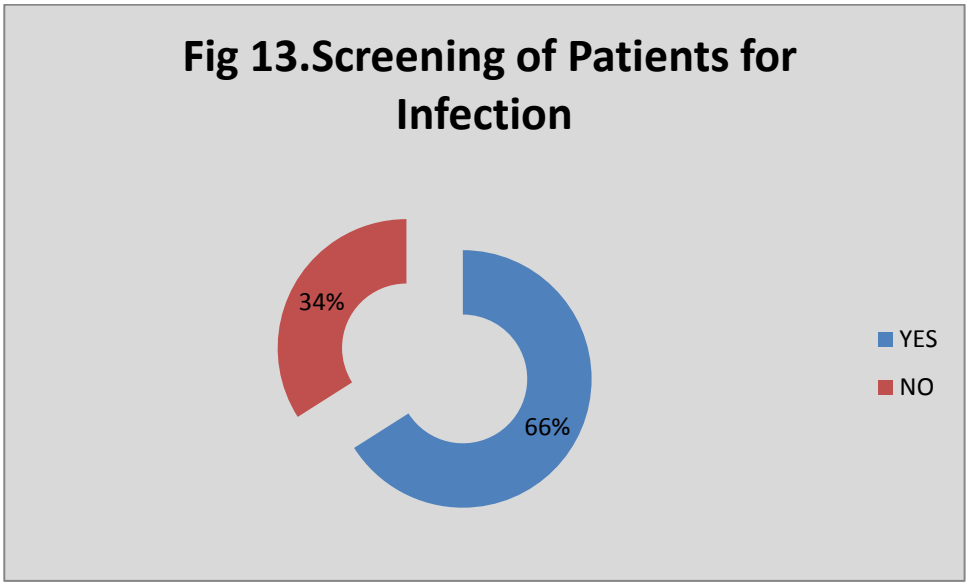

**INFERENCE:The figure 10 clearly shows that 50% of the Intensive Care Unit Nurses feel that if they wear gloves they do not need to wash hands and they will be safe from getting infected from nosocomial infections.**



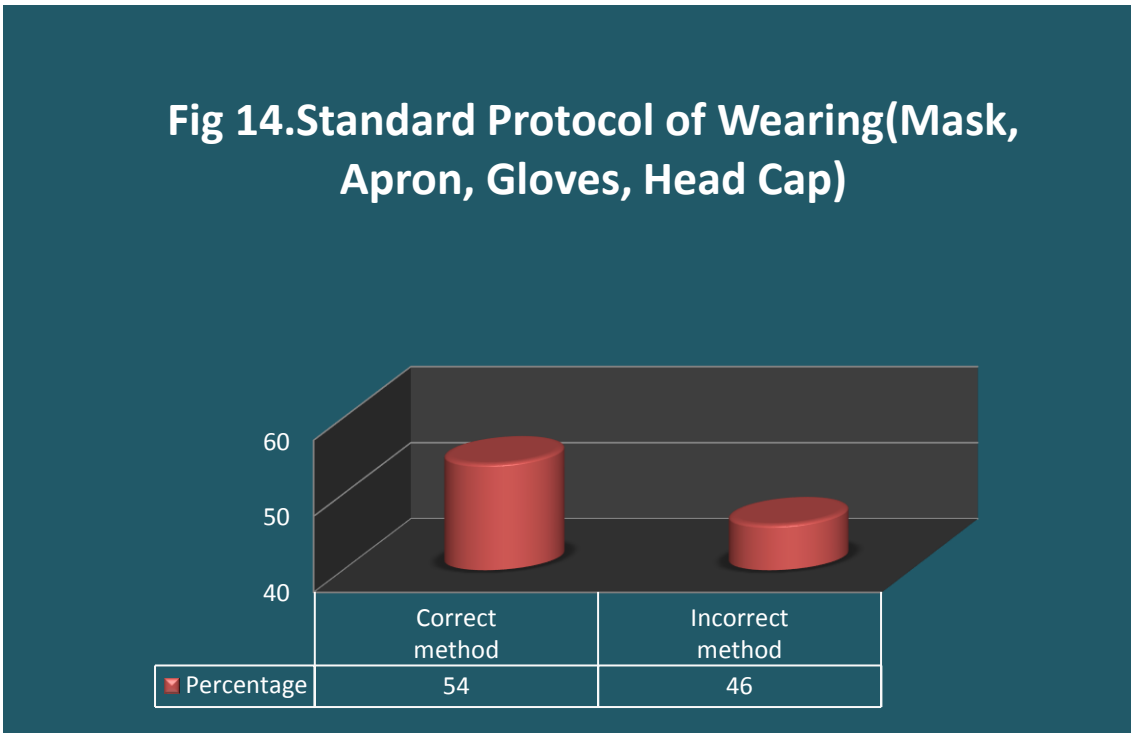

**INFERENCE:The figure 11 shows that 95%of the Intensive Care Unit Nurses believe that there is continous availability of supplies for precautions of infection.**



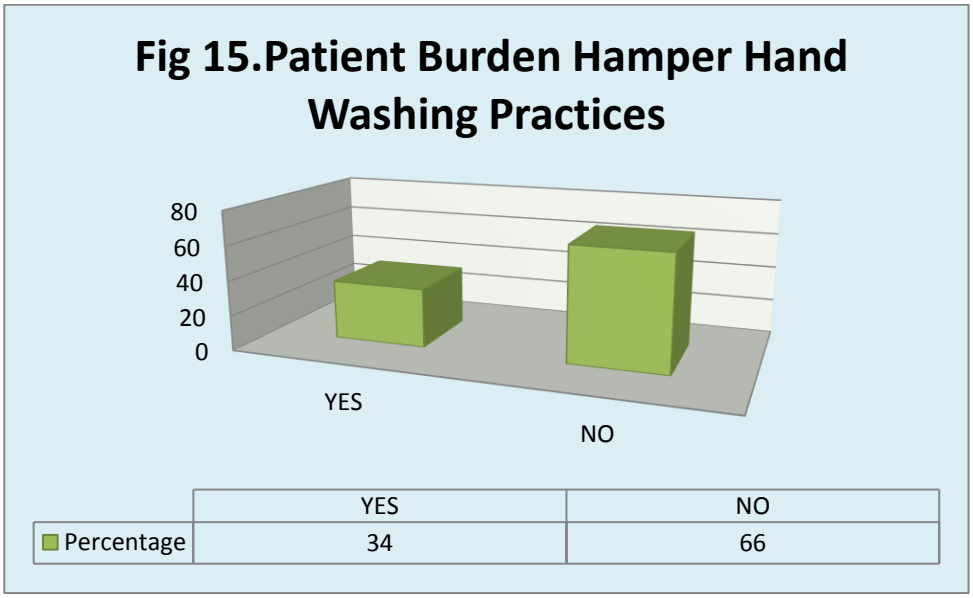

**INFERENCE:The figure12 clearly reveals that 84%of the Intensive Care Unit Nurses said that they had regular checks ups after providing care to the infected patient whereas 16%nurses disagreed.**



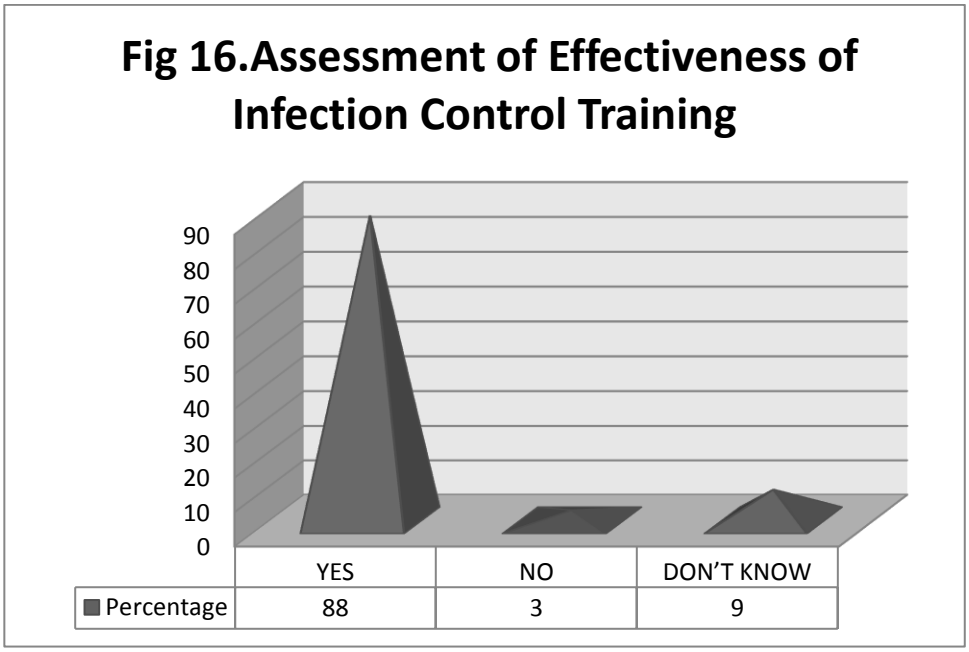

**INFERENCE:The figure 13 shows that 33% of the Nurses do not Screen Patients for Infection**



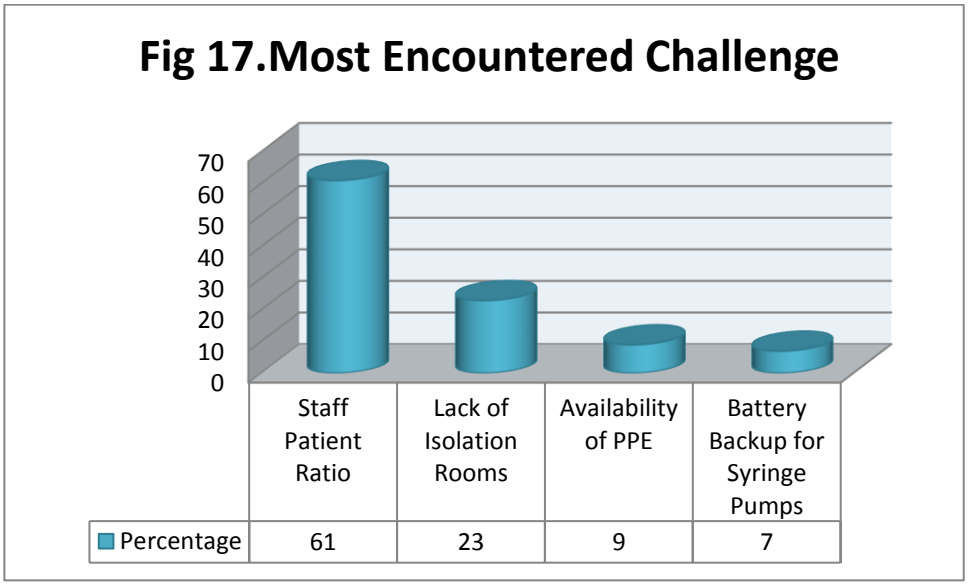

**INFERENCE:The figure 14 clearly shows us thatOnly54%of the Intensive Care Unit Nurses knew about the standard protocol of wearing the Mask, Gloves, Apron & Head Cap and 46%nurses were unaware of the Standard Protocol.**




**INFERENCE:The figure 15 shows that 34%of the Intensive Care Unit Nurses believe that they are overburdened with patients and this hampers their Hand washing practices.**




**INFERENCE:The figure 16 shows that 88% of the Intensive Care Unit Nurses believe that there occurs assessment of effectiveness of Infection Control Training.**




**INFERENCE:** **The Figure 17 shows that 61%of the Intensive Care Unit Nurses feel the greatest challenge is of shortage of staff, 23%of the nurses feel that there is lack of isolation rooms and 9% feel there is no availability of Personal Protective Equipment (PPE)**

# INTERPRETATION

Nurses in the Intensive Care Unit are well aware of the Nosocomial Infection existing in hospitals and the policy and surveillance regarding it but some fail to remember the surveillance system followed at Sarvodaya Hospital.

All the nurses have received a formal training in Hand Hygiene but very few of them were unable to recall the steps during Hand washing. Many of the nurses were able to recall the ideal time for hand washing.

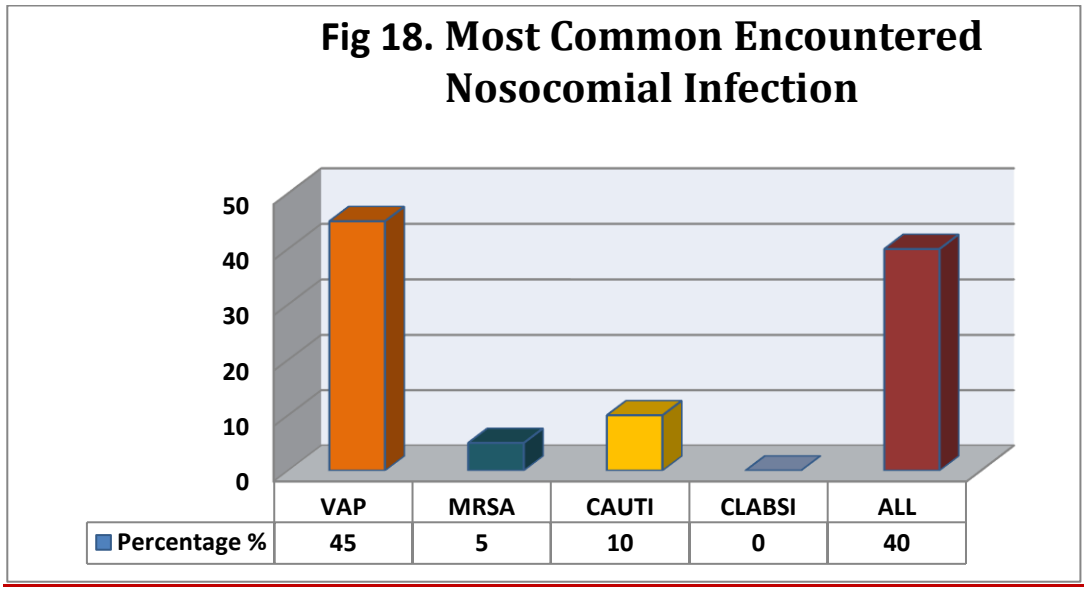
Standard protocols are followed by the nurses to maintain the utmost safety of the patient and providing the best possible care to the patient but many of them fail to recall the standard protocols of wearing gloves, head cap, apron, and mask. Some feel that wearing gloves eliminates hand washing requirements and 34 %of the nurses feel that overburdening of the patients hamper their Hand washing practices.

Nurses feel challenging in providing care to the nosocomial infection patient as there is fear of getting infection as mentioned by the nurses that they are not regularly screened for infections and this adds to their worry. Another challenge according to the nurses is understaffing and lack of more isolation rooms in the Intensive Care Units.And also there is no battery backup for syringe pumps, lack of availability of Personal Protective Equipment (PPE). One of the major challenge they face is of attendants i.e. sometimes there is no fixed timing for attendant.

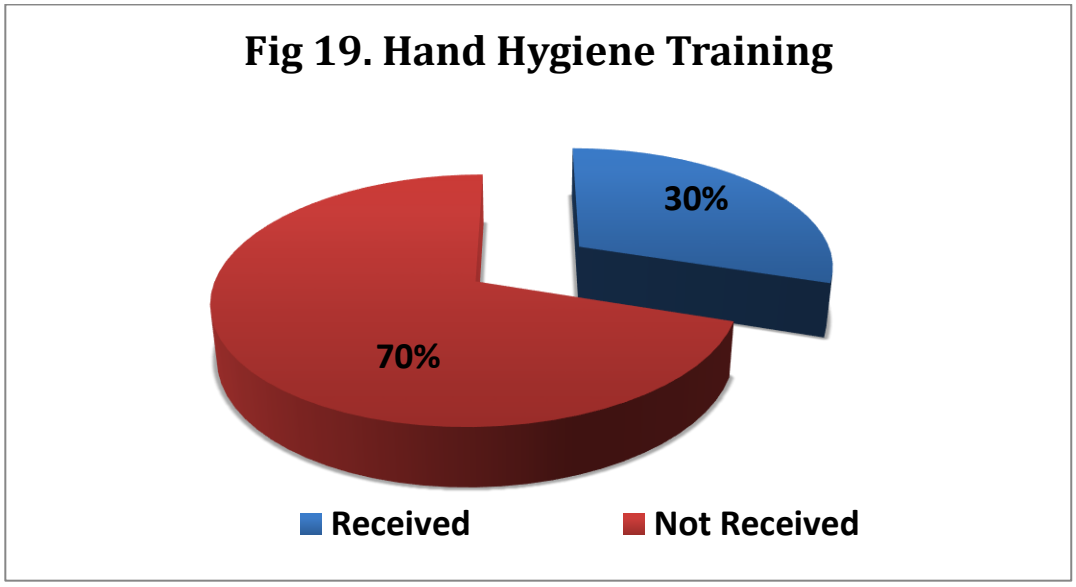
Some Nurses suggested some initiatives that will help them in overcoming their challenges and providing better care facilities to the patient.

- Aseptic Precautions and use Personal Protective Equipment (PPE)
- Avoid staff shuffling
- Staff patient ratio should be 1:1 for Ventillated patients.
- Education regarding the latest trends and precautions for nosocomial infections
- Regular survey for better enlightenment
- Adhering to strict Hand Hygiene Protocols**.**
- Proper disposal of Biomedical waste
- Fumigation to be carried out on the regular basis.

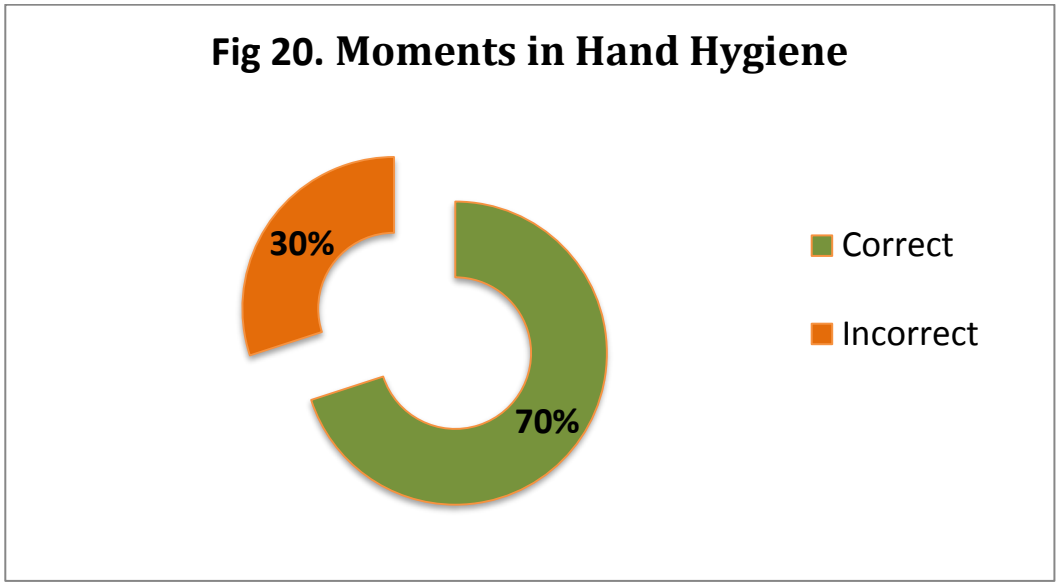
# PHYSICIANS Analysis



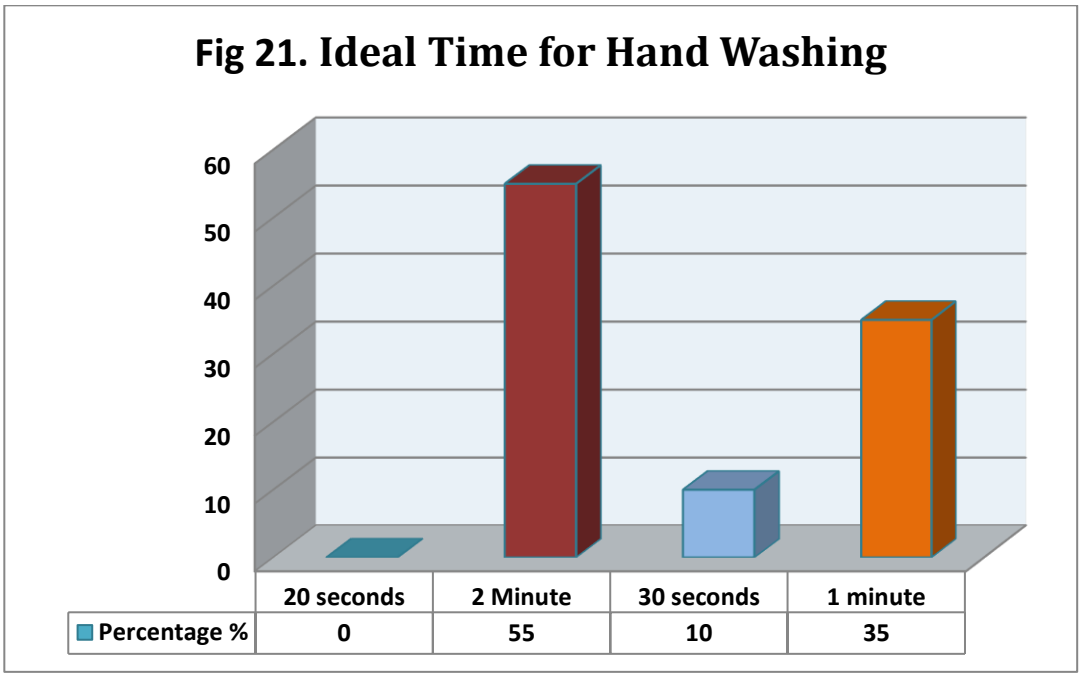

**INFERENCE**:**The figure 18 shows that45%of the Physicians from Intensive Care Units feel that the most common Nosocomial Infection In Sarvodaya Hospital is Ventilator Associated Pneumonia.**



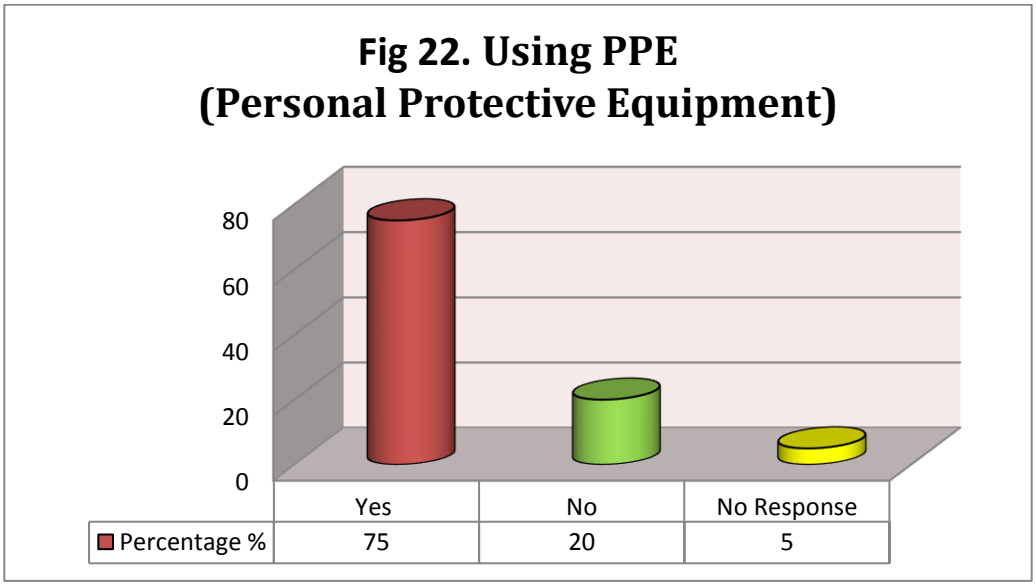

**INFERENCE**:**The figure 19 reveals that70%of the Physicians from Intensive Care Unit received a formal Hand Hygiene Training**




**INFERENCE:The figure 20 shows us that 70%of the Physicians from Intensive Care Unit were able to recall all the 5 Eureka Moments essential for Hand Hygiene.**

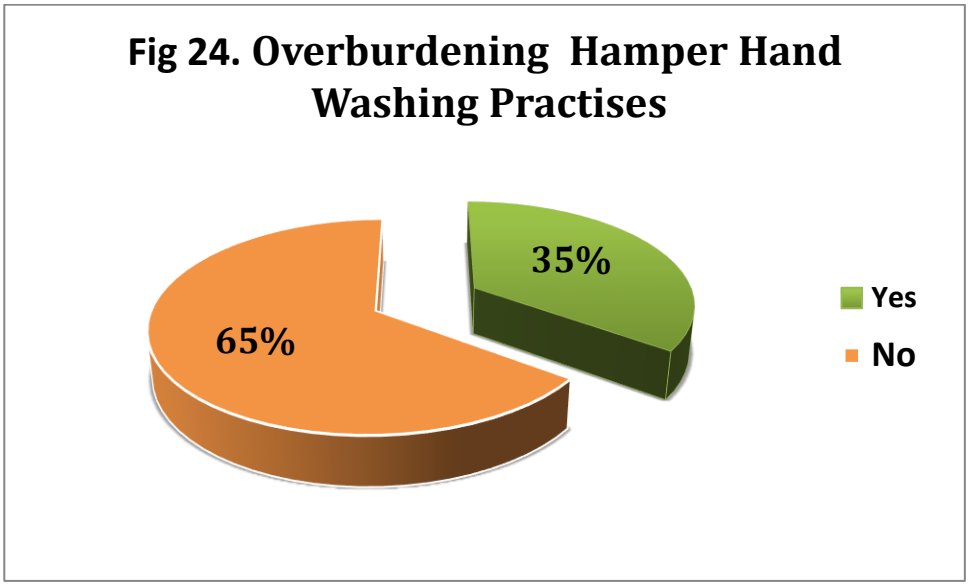



**INFERENCE:The figure 21 depicts that 55%of the Physicians from Intensive Care Unit feel that 2 minutes is the ideal time for Hand washing while 35% believe that 1 minute is the ideal time for washing hands.**

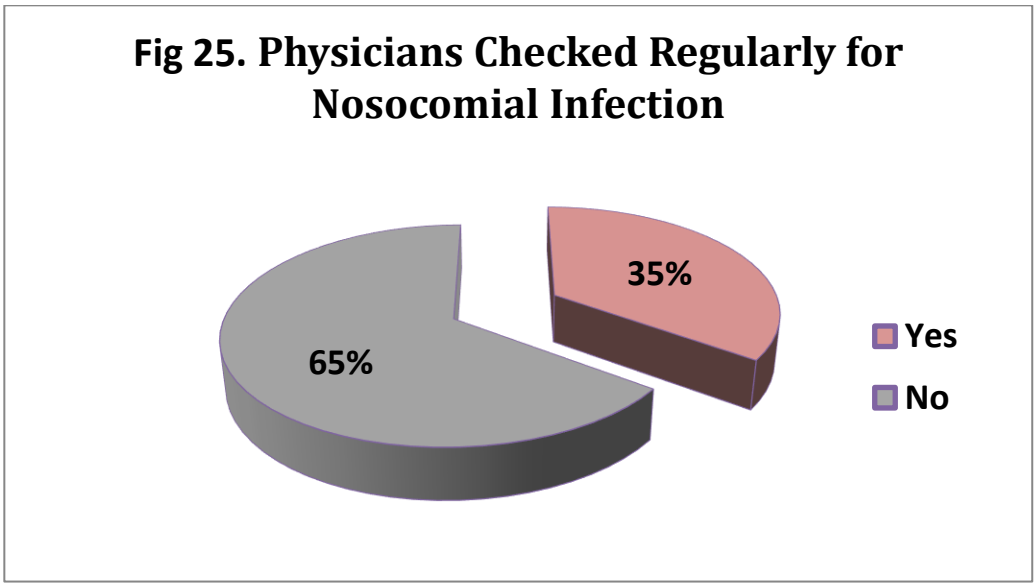



**INFERENCE:The figure22 shows that 75%of the Physicians from Intensive Care Unit use Personal Protective Equipment while treating Nosocomial Infected Patients.**

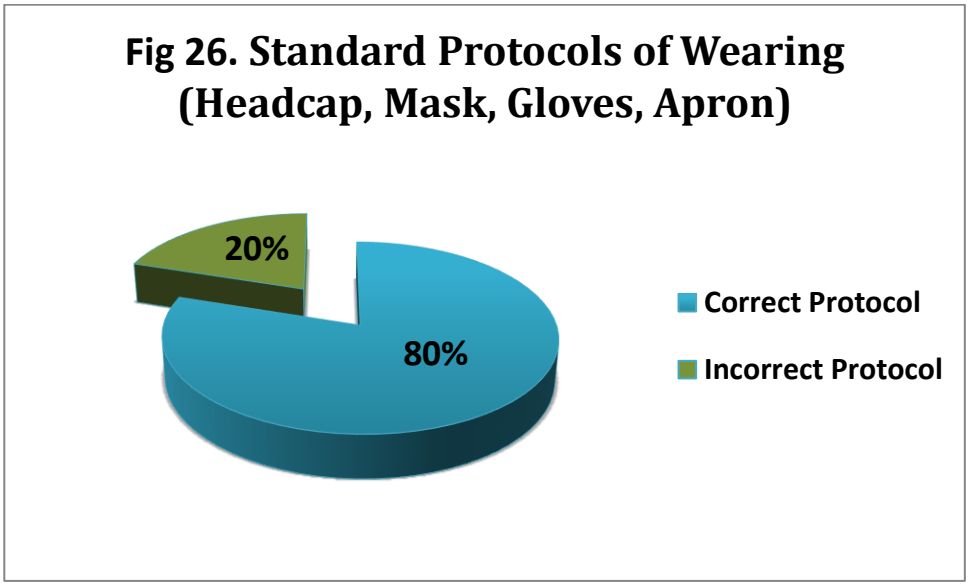
**INFERENCE:The figure 23 reveals us that90%of the Physicians from Intensive Care Unit disagree that wearing gloves eliminates the Hand washing requirement.**



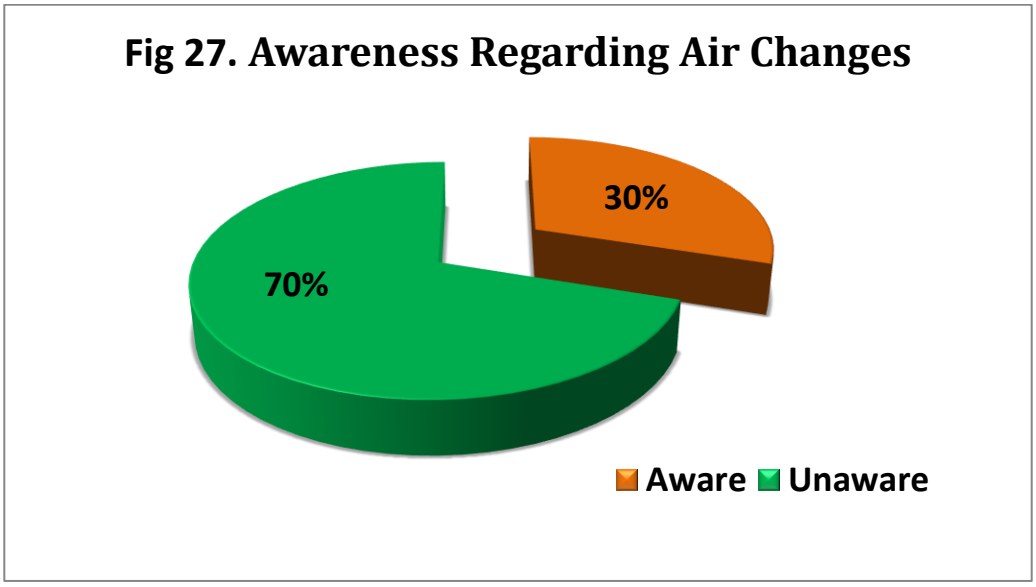

**INFERENCE:** **The figure 24 reveals that 35%of the Physicians from Intensive Care Unit feel overburdened by patients which hampers their Hand washing practices.**




**INFERENCE:** **The figure 25 reveals that 65%of the Physicians from Intensive Care Unit feel that they do not have regular health checkups after treating nosocomial infection patient.**

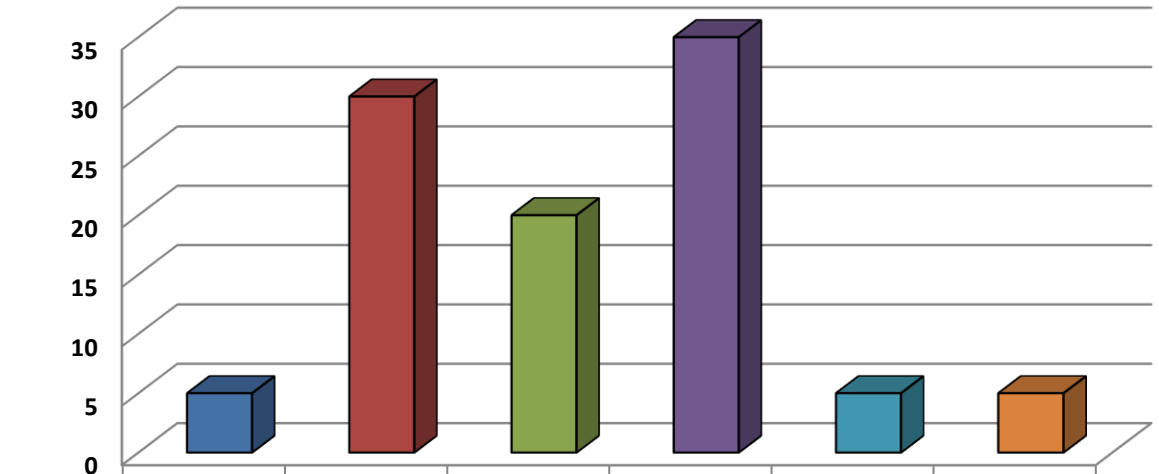



**INFERENCE:** **The figure 26 depicts that 80%of the Physicians from Intensive Care Unit follow and know Standard Protocols of Wearing Head cap, Gloves, Mask & Apron.**




**INFERENCE:** **The figure 27 shows us that70%of the Physicians from Intensive Care Unit were unable to recall the exact no of air changes required in the isolation rooms in the Intensive Care Units.**

## Fig 28. Challenges Encountered By Physicians




**INFERENCE:The figure 28 shows us thatResistant Bugs, over usage of Antibiotics and Pseudomonas are the major challenges faced by the Physicians in the Intensive Care Units.**

# INTERPRETATION

Physicians at Intensive Care unit at Sarvodaya are well aware of the Nosocomial Infection existing in hospitals and the policy and surveillance regarding it and maintain Standard protocols for encountering any kind of situation.

Many Physicians were able to recall all the Eureka Moments followed as a Standard Protocol after touching a Patient.

Standard protocols of wearing gloves, head cap, apron, and mask are followed. The Physicians are highly conscious regarding that the hand hygiene practices and they are aware that wearing of gloves does not eliminates the hand washing practices.

Physicians sometimes feels challenging in treating the nosocomial infection due to the unavailability of some particular drugs, over usage of antibiotics and they feel highly challenged in treating patients with Resistant bugs and Pseudomonas Infection.

Physicians suggested some initiatives that can help them in overcoming the challenges and providing better care facilities to the patient.

- Adhering to strict Hand Hygiene Protocols.
- Strict Implementation of Protocols and New Antibiotics Research
- Nurse training and education regarding Nosocomial Infections.
- Rationalization of Antibiotics.
- Regular use of Personal Protective Equipment while treating patients.
- Standard Protocols to be followed.

## SUGGESTIONS & RECOMMENDATIONS

1. Educate Doctors about Hand Hygiene; implementing standard precautions, particularly best hand hygiene practices at the bedside.Hand washing should be monitored regularly and continuous encouragement should be done.

2. Patient and his attendant should be educated and the importance of Hand Hygiene Practises should be explained to them.

**3.** Peer-to-peer learning will help in reducing the health care associated.

**4.** Consider Utilizing copper surfaces on bed rails, tables, IV poles and nurse call buttons.

5. An observer usually a nurse should use a checklist to ensure that evidence based practises are followed - Hand washing before line placement
    - Full barrier precautions
    - Avoiding line placement at the Femoral Site
    - Using Chlorohexidine to cleanse the site.
    - Removing unnecessary lines.

   (Using the above practice it has been seen that the infection rate reduces by almost 70%, mean rate of infection reduces from 4.5 per 1000 days to 1.3 per 1000 beds using central line in a study conducted by John Hopkins University's School of Medicine & Bloomberg)
6. Using Gamification Method award trophies to the ICU having recorded minimum no of cases of Healthcare Associated Infections. The nurses and Physicians of the particular department should be awarded and appraised creating competitiveness among others to perform well and win prize.
7. Complying with the Recommendations of the Antimicrobial use Committee regarding the use of antibiotics.
8. Improving & Promoting staff education and accountability; conducting research to adapt and validate surveillance protocols followed in the hospital.
9. Conducting research on the potential involvement of patients and their families in HCAI reporting and control.
10. There are only two infection control nurses. Employing more nurses for infection control team will minimizethe work load of IC nurse, so that work is made effective.
11. The infection control nurse maintains the surveillance data on infection control. Each ward in-charge and separate ICU's data shouldalso be maintained the same.

12. It is suggested to provide the feedback regarding rating to medical and nursing staffs (can be through circulars,newsletters etc)
13. Experienced and well trained staffs only should be allowed to treat “ISOLATED” patients. Adequate gloves, masks and disinfectants are available. The usage must be monitored by infection controlteam.
14. Outsourcing staffs should also be educated about infection control so that development of infection can beminimized to the least.
15. There should be initial orientation for new staffs that includes staff from every department that has linkage to the ICU’s e.g. Housekeeping, Food & Beverage on infection control. Training and educating newly recruited staffs will minimize infections in and around hospital.
16. There should be increase in knowledge regarding HCAI and routes of transmission, barrier nursing and hand washing techniques, hospital waste management, and importance of infection control team.
17. Nurses have a critical role to play in prevention and infection control and they should have scopes for continuous professional development.
18. Infection Control Nurses should be participating in the development & operation of Regional & National Infection Control Initiative.

# CONCLUSION

The study revealed that current physical facilities available for infection control are good and meets the NABH standard level. The study also provides baseline infections of Healthcare Associated Infections & associated risk factors for future surveillance.  There should be continous upgradation and updation of knowledge so that the infection level can further be reduced. This can be done by giving training to the staff regarding the awareness or Continuing Medical Education(CME) can also be organise.  The awareness about infection control should also be developed among attendants..

# ANNEXURE 1: QUESTIONNAIRE FOR PHYSICIANS

| | |
|---|---|
| Name of the Physician | |
| Employee ID | |
| ICU At MSSH, Saket | |
| Which of the following are most common encountered nosocomial infections (can select multiple) in your hospital setup?<br>a. Ventilator Associated Pneumonia(VAP)<br>b. Methicillin Resistant Staphylococcus aureus(MRSA)<br>c. Catheter Associated Urinary Tract Infection(CAUTI)<br>d. Centre Line Associated Blood Stream Infections(CLABSI)<br>e. All of the above | |
| Do you have an infection control team in your hospital? | (Yes/No) |
| Are you aware of any manual or policy for nosocomial infections in your hospital? | (Yes/No) |
| Have you receive a formal training for hand hygiene? What moments do you follow? | (Yes/No)<br>No of moments: |
| What is the ideal time of hand washing?<br>a. 20 seconds<br>b. 2 minute<br>c. 30seconds<br>d. 1 minute | |
| Is there any surveillance system for recording nosocomial infection? If yes, What is it? | (Yes/No)<br>Name: |
| Do you use PPE (personal protective equipment)? | (Yes/No) |
| Do you agree that wearing gloves eliminate the use of washing hands? | (Yes/No) |
| Is there a trained nurse employed regularly in the facility? | (Yes/No) |
| Do you feel having more patients hamper your hand washing practices? | (Yes/No) |
| Are there regular checkups for Physicians who comes in contact with infected patient? If yes how frequently? | (Yes/No)<br>Frequency =…… |
| How frequently do you screen patients for infection in the ICU? | (Yes/No)<br>Frequency =…… |
| Do you believe your colleagues follow standard protocols? | (Yes/No) |

| | |
|---|---|
| What is the standard protocol of wearing these in order (Mask, apron, gloves, head cap)? | |
| What should be the No of air changes in an isolation room?<br>e. 15<br>f. 20<br>g. 25<br>h. 30 | |
| Is there availability of a member from the infection control team? | (Yes/No) |
| Challenges you face while treating nosocomial infection? | |
| Initiatives (if any) should be taken for better controlling of nosocomial infections? | |

# ANNEXURE 2: QUESTIONNAIRE FOR NURSES

| | |
|---|---|
| Name of the Staff | |
| Employee ID | |
| ICU At MSSH, Saket | |
| Which of the following are most common encountered nosocomial infections (can select multiple) in your hospital setup?<br>f. Ventilator Associated Pneumonia(VAP)<br>g. Methicillin Resistant Staphylococcus aureus(MRSA)<br>h. Catheter Associated Urinary Tract Infection(CAUTI)<br>i. Centre Line Associated Blood Stream Infections(CLABSI)<br>j. All of the above | |
| Are you aware of any manual or policy for nosocomial infections in your hospital? | (Yes/No) |
| Have you receive a formal training for hand hygiene? If yes? How many steps are there? | (Yes/No)<br>Steps: …..... |
| What is the minimal time of hand washing?<br>i. 30 seconds<br>j. 1 minute<br>k. 20seconds<br>l. 2 minute | |
| Is there any surveillance system for recording nosocomial infection? If yes, what is it? | (Yes/No)<br>Name: |
| Do you receive staff training for nosocomial infection? If yes, How frequently? | (Yes/No)<br>Frequency =…… |
| Do you know what to do in an event of an Incident? If yes? What do you do?<br>e.g. needle stick injury | (Yes/No) |
| Do you use PPE (personal protective equipment)? If yes, what all are included in it? | (Yes/No) |
| Do you agree that wearing gloves eliminate the use of washing hands? | (Yes/No) |
| Do you go in ICU on call or are placed in shifts? | |
| Is there a continuous availability of supplies for standard precautions of infection? | (Yes/No) |
| Are there regular checkups for nurse who comes in contact with infected patient? If yes how frequently | (Yes/No)<br>Frequency =…… |

| | |
|---|---|
| How frequently do you screen patients for infection? | (Yes/No)<br>Frequency =…… |
| Do you believe your colleagues follow standard protocols? | (Yes/No) |
| Do you agree that wearing gloves eliminates the need of hand washing? | (Yes/No) |
| What is the standard protocol of wearing these in order (Mask, apron, gloves, head cap)? | |
| Do you feel understaffing/ overcrowding in relation to hand washing practices? | (Yes/No)<br>Frequency =…… |
| Does any member of the Infection Control Team work with the pharmacy to ensure compliance with antibiotic policy? | (Yes/No) |
| Is there any assessment of the effectiveness of infection control training?How frequently do you receive training? | (Yes/No)<br>Frequency =…… |
| Does the staff receive awards of their hand washing performance? If yes? How frequently? | (Yes/No)<br>Frequency =…… |
| Challenges you face while providing care to the patient? | |
| Initiatives (if any) should be taken for better controlling of nosocomial infections? | |

# ANNEXURE 3: QUESTIONNAIRE FOR INFECTION CONTROL NURSES

| | |
|---|---|
| Name of the Staff | |
| Employee ID | |
| ICU At MSSH, Saket | |
| Which of the following are most common encountered nosocomial infections (can select multiple) in your hospital setup?<br>k. Ventilator Associated Pneumonia(VAP)<br>l. Methicillin Resistant Staphylococcus aureus(MRSA)<br>m. Catheter Associated Urinary Tract Infection(CAUTI)<br>n. Centre Line Associated Blood Stream Infections(CLABSI)<br>o. All of the above | |
| Are you aware of any manual or policy for nosocomial infections in your hospital? | (Yes/No) |
| Have you receive a formal training for hand hygiene? If yes? How many steps are there? | (Yes/No)<br>Steps: …..... |
| What is the minimal time of hand washing?<br>m. 30 seconds<br>n. 1 minute<br>o. 20seconds<br>p. 2 minute | |
| Is there any surveillance system for recording nosocomial infection? If yes, what is it? | (Yes/No)<br>Name: |
| Do you receive staff training for nosocomial infection? If yes, How frequently? | (Yes/No)<br>Frequency =…… |
| Do you know what to do in an event of an Incident? If yes? What do you do?<br>e.g. needle stick injury | (Yes/No) |
| Do you use PPE (personal protective equipment)? If yes, what all are included in it? | (Yes/No) |
| Do you agree that wearing gloves eliminate the use of washing hands? | (Yes/No) |
| Do you go in ICU on call or are placed in shifts? | |
| Is there a continuous availability of supplies for standard precautions of infection? | (Yes/No) |
| Are there regular checkups for nurse who comes in contact with infected patient? If yes how frequently | (Yes/No)<br>Frequency =…… |

| | |
|---|---|
| How frequently do you screen patients for infection? | (Yes/No)<br>Frequency =…… |
| Do you believe your colleagues follow standard protocols? | (Yes/No) |
| Do you agree that wearing gloves eliminates the need of hand washing? | (Yes/No) |
| What is the standard protocol of wearing these in order (Mask, apron, gloves, head cap)? | |
| Do you feel understaffing/ overcrowding in relation to hand washing practices? | (Yes/No)<br>Frequency =…… |
| Does any member of the Infection Control Team work with the pharmacy to ensure compliance with antibiotic policy? | (Yes/No) |
| Is there any assessment of the effectiveness of infection control training?How frequently do you receive training? | (Yes/No)<br>Frequency =…… |
| Does the staff receive awards of their hand washing performance? If yes? How frequently? | (Yes/No)<br>Frequency =…… |
| Challenges you face while providing care to the patient? | |
| Initiatives (if any) should be taken for better controlling of nosocomial infections? | |

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