

**A CROSS SECTIONAL STUDY ON KNOWLEDGE, ATTITUDE
AND PERCEPTION OF HEALTHCARE WORKERS IN CONTROL
AND PREVENTION OF HOSPITAL ACQUIRED INFECTION**

Dissertation Submitted to



The IIHMR University, Jaipur

for the partial fulfillment for the award of the degree of

Master of Business Administration (MBA)

in

Hospital and Health Management

by

BHAGYASHREE S

Under the Supervision and Guidance of

DR. VARSHA TANU

2023

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DECLARATION BY STUDENT

I hereby declare that this dissertation titled “**A Cross Sectional Study on Knowledge, Attitude and Perception of Healthcare Workers in Control and Prevention of Hospital Acquired Infection**” is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

Name of Student: Bhagyashree S

Date: 05th June 2023

CERTIFICATE

This is to certify that dissertation titled “**A Cross Sectional Study on Knowledge, Attitude and Perception of Healthcare Workers in Control and Prevention of Hospital Acquired Infection**” is a record of the research work undertaken by Bhagyashree S in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur under my guidance and supervision and his/her approach to the research study has been sincere, scientific, and analytical.

Faculty Guide

IIHMR University, Jaipur

Jaipur Date: 5th June 2023

2023

School Dean

IIHMR University,

Date: 5th June

Date :

No.DGH/HR/305/23

20.05.2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. Bhagyashree S**, Naickanal, Thrissur has completed three months as **Quality Executive - Trainee** in the department of **Quality** of this Hospital from 21st February, 2023 to 20th May, 2023.

Daya General Hospital & Speciality Surgical Centre is a 300 bedded hospital with multi specialities consisting of Cardiology with Cath Lab, Gastroenterology, Critical Care Unit, Kidney Transplantation Unit, General Surgery, Laparoscopic Surgery, Paediatric Surgery, Plastic Surgery, Thoracic Surgery, General Medicine, Neuro Surgery, Neurology, Gynecology, Urology, Nephrology with Dialysis, Ophthalmology, Pulmonology, Orthopedics, Paediatrics, Psychiatry, Vascular Surgery, ENT, Radiology, Anaesthesiology, Dermatology, Dental, with advanced facilities in Operation Theatres, ICUs and Labour Room with Neonatal ICU. A well equipped Laboratory, X-ray, CT, Ultrasound Scanning, MRI Scanning, Mammogram and Physiotherapy facilities are also available under this hospital.

During this period her character and conduct were found to be good.

We wish all the success in her future career.



HR Manager

MANAGER (HR)
DAYA GENERAL HOSPITAL LIMITED
No. V/302 & 303, Shornur Road,
Near Viyyur Bridge,
Thiruvambadi P.O., Thrissur-680022

Date :

No: DGH/HR/306/22

20.05.2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ms. Bhagyashree S**, 2nd year MBA- Hospital Management Student of IIHMR University, Jaipur , has done her project entitled on **"A Cross Sectional Study on Knowledge, Attitude and Perception of Health Care Workers in Control and Prevention of Hospital Acquired Infections"** over a period from 21st February, 2023 to 20th May, 2023 as a partial fulfillment of her academic studies.

During this period her character and conduct were found to be good.



Mrs. Krishnaprabha Madhu



HR Manager

MANAGER (HR)
DAYA GENERAL HOSPITAL LIMITED
No. V/302 & 303, Shornur Road,
Near Viyyur Bridge,
Thiruvambady P.O., Thrissur-680022

ABSTRACT

An infection that is obtained in a hospital or other healthcare facility is referred to as a nosocomial infection or a hospital-associated infection. Nosocomial infections can result in severe pneumonia as well as infections of the bloodstream, urinary system, and other internal organs. The study employed a cross-sectional design since it focuses on three factors: the knowledge, attitudes, and perceptions of organisation personnel at a particular time. The relationship between perception and knowledge will be discovered using this method, and strategies to enhance both variables simultaneously will be suggested. In Thrissur, Kerala's Daya General Hospital Limited, the study is being done. 150 people were included in the study's sample, which was obtained through a convenience sampling procedure. Prior to that, a pilot study was carried out with 25 employees chosen randomly and revealed no bias or limitations. The study's self-created questionnaire has the hospital statistician's approval. To make sure that the personnel is educated on infection prevention and control methods, observation mode is employed. Bar graphs and pie charts are used to visualise percentage analysis, which is utilised for analysis. Chi square analysis is performed under the four headings of PPE, hand hygiene, needle stick injury, and waste disposal.

As a result, the chi-square analysis revealed that knowledge and perception are dependant to each other which means if knowledge is improved, their perception on prevention and control of nosocomial infection will improve. It is suggested after analysis that bundle care awareness be spread in order to make the tool (the bundle checklist) effective. This can be accomplished by regularly teaching every employee on CAUTI, CLABSI, VAP, and SSI. Employees in dietary, linen and laundry, mortuary, and other utility services, in addition to the nursing staff, can also be educated about hospital infection control and its rules, to reduce hospital acquired illnesses, we can also encourage the use of alcohol-based hand rubs and hand sanitizers, and we can adopt "Hand Hygiene" as a healthcare personnel's motto. By allocating responsibilities and activities, keeping a proper teaching pipeline, and incorporating all staff members and specific departments into the programme, you may promote hand hygiene wherever possible. In addition to advocating standard precaution at all times, classes could be planned to discuss or educate employees about potential risk factors in a specific area, encourage peer-to-peer learning, and promote hand hygiene. Additionally, encourage initiative among staff members by giving them goals, assessing their work, praising them, etc. Make sure to conduct routine, methodical evaluations that consider both theory and practise, and then share the results

with your staff. The hospital's infection control policies, reporting procedures, and risk reduction process should be made known to all clinical staff. It is best to promote full vaccination, especially for Tdap and Varicella. immunisations against influenza and Hepatitis B. When caring for patients who have airborne diseases, the nursing staff is ill-prepared to utilise N95 masks in the correct manner. The usage of safety equipment when caring for patients who are contagious can also be made more generally recognised. The edges of privacy curtains, doorknobs, lift buttons, phones, call bells, bedrails, light switches, computer keyboards, wall areas and monitoring equipment are just a few examples of high contact surface areas that should be made clear to housekeeping workers.

Key Words: Nosocomial infection, Hand Hygiene, Personal Protective equipment, Needle Stick Injury, Vaccination

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BHAGYASHREE S

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CHAPTER- 1

INTRODUCTION

CHAPTER- 1

INTRODUCTION

“Care in an absolute, Prevention is the ideal”

Nosocomial infectious diseases develop as a result of an infection or toxin encountered especially in medical settings, like a hospital. Hospital-acquired infections (HAIs), healthcare-associated infections (HAIs), and nosocomial infections are terms that are frequently used interchangeably currently. Prior to receiving medical care, a HAI patient cannot have the infection. Infection originates when the bacteria or viruses infect a patient or a different susceptible host. In the wider picture of contemporary healthcare, these infections have been linked to invasive procedures, surgery, indwelling medical devices, and prosthetic devices. Nosocomial infections, also referred to as hospital-associated infections (HAI), are illnesses that patients acquire while undergoing treatment but weren't already afflicted with at the time of admission. They could show up in a variety of contexts for the provision of healthcare. Since hospital acquired infections represent a threat to one's health, the potential of an infection spreading across hospital patients and staff must be minimised. A successful infection control programme reduces patient morbidity and mortality, the length of hospital stays, and related expenses. The forms of HAI are essentially categorised by the Centres for Disease Control and Prevention are, Central line-associated bloodstream infections (CLABSI), Catheter-associated urinary tract infections (CAUTI), Surgical site infections (SSI) and Ventilator-associated pneumonia (VAP)

Infections brought on by medical care place a heavy strain on patients, society, and the healthcare industry. The resurgence of infectious diseases like the plague and tuberculosis along with life-threatening infections like severe acute respiratory syndrome (SARS) have brought attention to the need for effective infection control programmes in all healthcare settings as well as capacity building for healthcare professionals to implement them.

When performed properly, an infection control programme is deemed effective if it limits the transmission of infections among hospital patients as well as staff members. A good infection control strategy also significantly lowers patient morbidity and mortality, hospital stay time, and hospital stay costs. This is accomplished through managing and preventing infections by putting research-based information into practise. (ICMR, 2016)

The second most prevalent cause for animal and plant death is Infectious and communicable illnesses, which are a source for concern worldwide. Prior to the discovery of infectious illnesses, infections were frequently attributed to several conditions. Contagious and infectious diseases were far later concepts to develop; transmissible and spreadable diseases were first. Even in high-income countries, infectious illnesses caused an average life expectancy of under 50 years before the development of antibiotics. Mainly due to public health initiatives like cleanliness and the use of antibiotics to treat various diseases, life expectancy has risen significantly in the 20th century. Infectious diseases are still a major public health issue worldwide, despite the fact that it was once believed they could be completely managed. In the past 35 years, at least 30 new infectious and communicable diseases have emerged, the majority of which are zoonotic in nature. The enormously mobile global population, which is dealing with both new infections (like COVID-19) and the global epidemic of infectious diseases that are multidrug-resistant, has recently been more and more impacted by the socioeconomic, environmental, and ecological effects of infectious diseases. Almost all pathogenic microbes now have some level of antibiotic resistance, and there aren't many new antimicrobials being created and released to the market. (Mainul Haque, 2018)

1.1.RESEARCH QUESTION

Keeping the fact in mind that, nosocomial infection is a serious concern and can cause serious even fatal issues among patients, it is important to assess the knowledge, attitude and perception of healthcare workers about prevention and control of nosocomial (hospital associated) infection, increasing awareness among staff.

1.2.STATEMENT OF PROBLEM

- Nosocomial infection defects one's functioning and increases stress and tension which is a major cause of morbidity.
- According to research by the National Library of Medicine, more than 40% of diseases spread in hospitals are caused by improper hand hygiene.
- According to the WHO, 15% of all patients admitted to hospitals have a nosocomial infection. Hospital patients are subjected to several kinds of microorganisms including those from medical professionals alongside other sick people.
- By implementing infection control procedures and keeping track of antimicrobial use and resistance, nosocomial infections can be prevented. Planning to lower the

incidence of nosocomial infections can greatly benefit from an effective surveillance system.

1.3.OBJECTIVES

- To assess the knowledge of healthcare workers on nosocomial infection and prevention techniques
- To know the perception and practice of healthcare workers on nosocomial infection and prevention techniques
- To determine if knowledge is dependent on perception of employees on nosocomial infection and prevention techniques
- To assess the attitude of staff towards attending training sessions on control and prevention of nosocomial infection

1.4.IMPLICATION OF RESEARCH

- Nursing staff's degree of knowledge on nosocomial infections and how to avoid and control can be assessed.
- The study allowed to know the perception and attitude of nursing staff towards control and prevention of nosocomial infection.
- Basic measures for infection control along with universal precautions can be assessed for every clinical staff in the hospital.
- Instructors get to know the weak areas of knowledge and perception of nursing employees about nosocomial infection.
- Routine surveillance of infection control will be conducted.
- Education and training for health care workers are carried out in much more systematic manner.

1.5.HOSPITAL/COMPANY PROFILE

Daya General Hospital Limited was founded on the vision of Dr. V. K. Abdul Azeez and a group of medical professionals to offer the average person access to high-quality, reasonably priced healthcare. By providing its patients with high-quality, reasonably priced healthcare, Daya has carved out a unique place for itself in Kerala's healthcare industry. "Caring with compassion" is the hospital's motto, and it is adhered to.

Vision: To be a centre for excellence which provides high quality patient-centred care affordable and accessible for all

Mission: Daya is committed to providing the best yet affordable healthcare service upholding the code of medical and social ethics. We strive to deliver maximum value to the patients through our focus on clinical excellence and value-based scientific health care delivery. Our dedicated staff put patients first- every time

Quality Policy: To provide high quality, patient-centred care at affordable cost through continuous quality improvement

Scope of services include Accident and Emergency, Anaesthesiology, Cardiology, Cardiothoracic surgery, Dermatology, ENT, Medical Gastroenterology, Surgical Gastroenterology, General Medicine, Internal Medicine and Critical Care, General and Laparoscopic surgery, Nephrology, Family Medicine, Geriatrics, Neurology, Neurosurgery, Obstetrics and Gynaecology, Ophthalmology, Orthopaedics and Joint Replacement Surgery, Paediatrics, Paediatric Surgery, Plastic and Reconstructive Surgery, Psychiatry, Pulmonology, Radio diagnostics and Imaging, Urology and Andrology and Robotics

Allied health care service includes Dietetics, Infection Control, General Nursing, Haemodialysis, Lab-Biochemistry & Haematology, Lab- Microbiology & Serology, Pathology and Pharmacy

CHAPTER- 2

REVIEW OF LITERATURE

CHAPTER- 2

REVIEW OF LITERATURE

Nosocomial infection and its prevention and control has been a serious topic since the outbreak of COVID-19. Nowadays precautions are taken by every common man. The COVID-19 pandemic and other recent significant disease outbreaks have emphasised the extent to which health care settings can contribute to the transmission of illnesses, causing harm to patients, health staff, and visitors if infection prevention and control (IPC) is not prioritised. However, according to a recent World Health Organisation (WHO) report, 70% of those diseases can be avoided by practising proper hand hygiene and other cost-effective practises. Today, seven patients in wealthy nations and 15 patients in low- and middle-income countries would get at least one health care-associated infection (HAI) during their hospital stay for every 100 patients in acute-care hospitals. On average, one out of every ten affected patients would die as a result of their HAI. (WHO, 2022)

2.1. An article was published on **Impact of Education on Knowledge, Attitudes and Practices Among Various Categories of Health Care Workers on Nosocomial Infections** by J B Suchitra and N Lakshmi Devi in the Indian Journal of Medical Microbiology. The study's goal was to evaluate the different health care workers' (HCWs) knowledge, attitudes, and practises regarding nosocomial infections. There were 150 HCWs in total, along with 50 physicians, 50 nurses, and 50 ward assistants. To evaluate the HCWs' knowledge, attitudes, and practises about nosocomial infections, a questionnaire was given to them. After completing an education module, they underwent a subsequent round of identical surveys at intervals of 6, 12, and 24 months. During the post-education period, subjects in each category of staff were checked to see if they were following the ward's hand washing procedures. Software for statistical analysis was employed. It was noted that different HCWs had varying degrees of compliance with hand washing regulations. Ward assistants were the most compliant, at 76.7%, of the whole population. Knowledge retention in the areas of nosocomial infections and infection prevention differed significantly. Additionally, it would result in a modification of attitudes and behaviours that would lower the frequency of nosocomial infections. The challenges to practising hand hygiene at the group level were

attributed to a lack of education, a heavy workload, particularly when the ward was fully occupied, understaffing, working in critical care units, a lack of motivation, and a lack of senior staff role models. Individually, the perceived hurdles were a lack of training and experience, ignorance of institutional policies. All employee categories benefit from education in terms of knowledge, attitudes, and practises retention. For all personnel classifications, a system of ongoing education must be developed. Adherence to interventions is required to lower the incidence of nosocomial infections. (JB Suchitra, 2007)

2.2.A study named **Knowledge of Healthcare Workers On Nosocomial Infection In Selected Secondary Health Institutions In Zaria, Nigeria** was researched by Samaila Ayuba Balarabe, Istifanus Anekoson Joshua, Aliyu Danjuma, Mohammed Usman Dauda, Omoniyi Oluwafemi Sunday and Haruna Danlami Yusuf. This study was an October 2010 cross-sectional descriptive survey. The study included 160 self-administered semi-structured questionnaires, and SPSS was used to analyse the data. The majority of respondents (57.5%) knew that nosocomial infections are illnesses that appear 48 hours or more after a patient is admitted to the hospital. According to 76.9% (123) of the responders, bacteria are frequently the cause of nosocomial illnesses. Contact transmission outperforms airborne a transmission, according to 38.8% of respondents. The most frequent modes of nosocomial infection transmission are vehicles and vectors. The best ways to prevent nosocomial infections, according to 46.9% of respondents, are strict aseptic technique, proper isolation and barrier nursing of infectious cases, routine throat and nasal swab examinations of health care workers, and training of health workers in the prevention and control of the infection. The majority of respondents (73.8%) were aware of the various precautions that staff members can take to protect themselves from nosocomial infections, including proper face mask use while attending to infectious cases, proper handling of sharp objects and disposal into their proper containers after use, and proper glove use before procedures involving patient body fluid contact. The emphasis on ongoing in-service training for employees, the use of universal precaution, and hospital staff screening were among the recommendations. (Samaila Ayuba Balarab, 2015)

2.3.A study on was conducted by Yamini, Animesh Jain, Chetan Mandelia, S Jayaram at Kasturba Medical College Mangalore, Karnataka, India. A pretested partially structured template was used in a cross-sectional study in conjunction with interview and observational methods. Using convenient sampling, 120 healthcare professionals—50 final-year MBBS students and 70 hospital employees, including nurses and technicians at the two Government District Hospitals—were determined, and their attitudes and practises regarding infection control measures were examined. Only 55.7% of the 120 participants, the majority (85.8%), were actually tossing spent needles and syringes in puncture-resistant containers. A staggering 75 percent (74.8%) of the participants were aware that they shouldn't recap the needles after using them, however only 35.4% were actually doing so. Only 77.1% of healthcare personnel reported using masks and gloves when handling patients, despite the fact that all of them were aware of the need for them. Additionally, we discovered that only 35.7% of labs, wards, and operating rooms had three different coloured bags, only 61.8% of staff members cleansed their hands after each patient, and only 94.3% disinfected the area with a sterile swab before administering injections. Only a small percentage of the workers (11.7%) had already been exposed to contaminated blood samples, and some (19.2%) are still being exposed. For the security of both them and their patients, healthcare staff must enhance how they view and apply infection control procedures. Additionally, they should have a Hepatitis B vaccination and notify the infection control committee of any unintentional exposure to infectious materials. All HCWs must receive a Hepatitis B vaccination before beginning their hospital duties since needle-stick injuries can spread the hepatitis B virus. The frequency of nosocomial infections could be decreased by implementing an occupational health awareness programme from the start of pre-clinical training to educate people about occupational dangers, immunisation laws, and the value of common safety procedures. (Yamini, 2012)

2.4. Journal of Hospital Infection (2006) published a study on **Using An Integrated Infection Control Strategy During Outbreak Control To Minimize Nosocomial Infection Of Severe Acute Respiratory Syndrome Among Healthcare** by M.-Y. Yena,j, Y.E. Linb, I.-J. Suc, F.-Y. Huangd, F.-Y. Huange, M.-S. Hof, S.-C. Changc, K.-H. Tang, K.-T. Chenc, H. Change, Y.-C. Liua, C.-H. Lohh, L.-S. Wangi and C.-H Leej. While providing care for SARS patients, healthcare professionals run the danger of contracting severe acute respiratory syndrome (SARS). The protection of HCWs with personal protective equipment and isolation chambers under negative pressure has not always been effective. We implemented a novel, comprehensive approach to infection control that prioritised patients employing barriers, zones of risk, and substantial alcohol dispenser installation for glove-on hand rubbing. A SARS-designated hospital that lacked access to NPIRs adopted this comprehensive infection control strategy. A comparison was made between the number of HCWs who contracted SARS in the study hospital and the number of HCWs who did so in 86 Taiwanese hospitals that did not implement an integrated infection control plan. Even though the value of hand washing in preventing nosocomial infection has long been recognised, a 30% compliance rate has always been an issue in practise. The need of handwashing cannot be overstated, despite the commonly recognised advice to wear gloves as the primary barrier precaution.^{16,17} We hypothesised that the lack of requirement for HCWs to wash their hands while wearing gloves may have contributed to the direct or indirect casual contact that led to the spread of SARS. Nosocomial transmission may be further increased by ineffective clean/dirty area differentiation. Circumstantial data from a small six-hospital assessment suggested that two SARS-affected hospitals that did not isolate the isolation ward from the patient transport route were epidemiologically associated to transported SARS patients.¹⁸ An essential component of the integrated infection control plan is the strategic placement of alcohol dispensers to mandate hand sanitization across zones of risk. In order to reduce the spread of SARS, we encourage this common practise to raise awareness and careful adherence to routine handwashing when operating between zones of danger. (M.-Y. Yen, 2006)

2.5. The purpose of the study by Ali Khani Jeihooni, Seyyed Hannan Kashfi, Mina Bahmandost and Pooyan Afzali Harsini was to determine the effect of educational program based on Health Belief Model (HBM) on promoting preventive behaviors of nosocomial infections in nurses. There were 120 nurses participating in this randomised controlled trial study from a hospital in Fasa City, Fars (Iran). The educational intervention for the intervention group included lectures, group discussions, questions and answers, posters, brochures, videos, and PowerPoint presentations. It also included eight training sessions lasting 55–60 minutes each. The first and second sessions concentrated on providing an overview of nosocomial infections as well as their symptoms and complications. The third and fourth sessions covered the principles of proper hand sterilisation, the use of gloves and masks, patient isolation, hand hygiene, hospital waste disposal, and preventing contact with contaminated respiratory secretions. The fifth and sixth sessions covered the advantages and challenges of using standard precautions. The seventh session addressed the role of self-efficacy and standard precautions. The Health Belief Model served as the foundation for the creating of the questionnaire, which asked respondents about their knowledge, perceived vulnerability, perceived severity, perceived advantages, perceived barriers, cues to action, performance checklist, and demographic data. In terms of level of knowledge, perceived susceptibility, perceived severity, perceived advantages, perceived barriers, self-efficacy, performance, and signals to action, the results did not indicate any significant differences between the intervention and control groups prior to the intervention. Except for perceived impediments, the intervention group outperformed the control group significantly in each of these domains both immediately following the intervention and four months later. When compared to the control group, the intervention group's perceived obstacles component fell dramatically. (Ali Khani Jeihooni, 2018)

2.6. A study was conducted on by Vasantha Priya Jeyasheelan, Sumetha Suga Devasuga, Sindhura Myneni, Divya Ravikumar, Manuel Raj Kumar, Poonguzhali Sivagananam, Vahithamala Kunasekaran, Pandian Balu, Udayakumari Meesala Chelladurai, Yuvasree Sargunan, Sai Ravi Teja Kamineni, Vishnu Priya Veeraraghavan and Surapaneni Krishna Mohan. The

study's objective was to assess the degree of knowledge and perception among medical professionals working in tertiary care settings on reducing HAI. Data was gathered using a semi-structured tool. 262 people from 367 medical specialists were included in the study. Both descriptive and inferential statistics were used to analyse the data. The majority of healthcare professionals (93%) are adequately knowledgeable about hospital acquired infection. 94% of those polled were aware that in-patients are the group most at risk for HAI and that respiratory tract infections are the main source of HAI. 91% of respondents agreed that HAI is primarily caused by healthcare professionals. 87% of them were aware that sick time may be used if they had respiratory or gastrointestinal issues. 75% of people are aware that wearing gloves will stop the spread of infection. 97% agreed that antiseptic hand washing can reduce the spread of HAI. 67% of them agreed that it was necessary to change the gloves while attending to many patients. 111 out of 262 people, or 42%, believed that washing hands before patient interaction was unnecessary. Out of 262, 77% (202 out of 262) thought all patients might be contagious. 91% (239 out of 262) were aware that patients who coughed while being transferred to another room for further assessment should be given masks. 81% (213 out of 262) of patients had their blood, vomit, or other bodily fluids splashed on them. 90% (235 out of 262) were aware of the body fluid exposure protocol. 91% (237 out of 262) were aware that common objects like pens, phones, aprons, and uniforms might spread illnesses picked up in hospitals. 81% of respondents (211 out of 262) said it was appropriate to clean the stethoscope after each patient was examined with an antiseptic. In the ward, infected patients must have sufficient bed spacing (1.5 metres) and a curtain between beds, according to 68% of people (179 out of 262). 92% (241 out of 262) of those surveyed were aware that air sampling and OT culture techniques are used to track the prevalence and transmission of nosocomial diseases within the hospital environment. 229 out of 262 people, or 87%, knew that visitors could bring infectious agents into a patient's room and do so, potentially harming the patient's prognosis. 95% (248 out of 262) were aware that during this epidemic season, frequent hand washing and avoiding touching the mouth and nose could successfully protect them from spreading the contagious microorganism. 41% (107 out of 262) of health care professionals strongly agreed that HAI has a negative effect on the patient's outcome, which is how most of them felt about it. 58% (153 out of 262) strongly

agreed that good hand hygiene can reduce the risk of HAI. A majority of respondents (140 out of 262) strongly agreed that poor hand cleanliness and careless PPE use are to blame for hospital-acquired diseases. 71% firmly agreed that patients who tested positive for HBV, HCV, or HIV should receive particular care. Patients with HIV Antigen should be treated in an isolation ward, according to 44% of respondents. 78% firmly believed that immunisation of healthcare professionals is required. When asked if PPE is necessary when a healthcare worker is immunised, 35% strongly disagreed. 51% firmly agreed that treating multi-drug resistant germs requires consideration of medical history and past antibiotic use. 60% firmly agreed that recapped old needles should not be used. 47% firmly agreed that practising hand cleanliness reduces the risk of infecting patients. (Vasantha Priya Jeyasheelan, 2020)

2.7.A cross sectional study on conducted in Civil Hospital, Rajkot from October 2014 to December 2014 by Ankit M. Sheth, Darshan S. Jani , Matib M. Rangoonwala, Amiruddin M. Kadri. Out of 184 staff nurses in total, 92 (or 50% of the total after convenient sampling) were chosen. Each substitute nurse was chosen for an interview after an alphabetical list of all staff nurses was created. 83 of the 92 staff nurses contacted agreed and provided a thorough response. A pretested semi-structured questionnaire was used for the interview, and Excel 2007 was used for the analysis. Participants 80 (93.02%) had heard about HAIs. The two most frequent HAIs, according to more than half (60.4%) of the individuals, were urinary and respiratory tract infections. Direct skin-to-skin contact and incorrect handling of biomedical waste were noted by 52 (60.4%) of the participants as the two main ways that HAIs are spread. Hand washing was a habit for 47 patients (56.6%) both before and after surgery. Thirty individuals (36.1%) had 'good' understanding of HAIs. The study found that the nursing staff had an average degree of knowledge and experience with HAIs. Given the crucial role nurses play in HAIs, a system of ongoing education must be created to raise nurses' knowledge, encourage them to adopt healthy behaviours, and reinforce safeguards. (Ankit Sheth, 2015)

2.8.A study on was carried out by Shreya Gandhi, Ujjwala Dehankar and Neena Nagdeo. The NKP Salve Institute of Medical Sciences and Research Centre in Nagpur conducted this cross-sectional survey from March 2013 to May 2013. A typical HAI questionnaire was distributed to all registered staff nurses working in the medical, surgical, and intensive care units (153). 125 of them answered the questionnaire, making them eligible for the study. A health care worker has a risk of developing HAI, according to all 135 nurses. However, only 16.8% of respondents were aware of HICC. Only 62.4% of the nurses were aware that a needle should never be recapped before being disposed of by cutting, despite the fact that 99.2% knew the rules for caring for patients known to harbour blood-borne diseases. Only 53.5% of nurses knew when to change the dressing of patients with central IV lines, whereas all nurses were familiar with basic skin disinfectants and when to use them. All 125 nurses were aware of the many types of waste disposal and agreed that it was important to separate and classify trash before disposal. They also all knew how to dispose of used syringes and needles. 97.6% were able to properly dispose of patient-related infectious items. Eighty eight percent of nurses said that everyone who works in the hospital has a responsibility for disposing of garbage, while eight percent, two percent, and one percent of doctors, however, thought that obligation fell to them. Everybody knew to wash their hands. But not all of them agreed that it was applied consistently. While 77.6% of nurses believed that hand washing was done consistently, 22.4% believed that not everyone washes their hands frequently. While 9.6% of nurses see universal precautions as preventative measures, 90.4% of nurses think they are required. Only 76.8% of nurses believe that general precautions should be taken at all times for every patient, while 21.6% believe that they should only be used for HIV patients. But only in the operating room did 1.6% of people adhere to general safety procedures. Only 67.2% of nurses believe all patients can spread infections, while 75.2% believe all blood and bodily fluids are contagious and all sharps and needles that haven't been sterilised are contaminated. According to the study's findings, the nurses who participated in it were aware of standard measures, hand hygiene, waste disposal, and disinfection. However, it was discovered that they knew inadequate about hospital acquired infections. (Shreya Gandhi, 2017)

2.9.A study named **Assessment of Knowledge, Attitude, And Practices On Hospital Acquired Infections, Prevention And Control Measures Among A Group Of Healthcare Workers – A Cross-Sectional Study** was carried out by Sai Subhakar Desu, Savitha Rani B. A cross-sectional study was conducted on 161 healthcare professionals over the course of three months (January to March 2022) at the Sri Siddhartha Medical College and Hospital in Tumkur, Karnataka, India. The study included medical students, interns, and postgraduates. Participants received pretested semi-structured questions that were chosen using practical sampling approaches. The biggest number of participants' answers to knowledge questions about HAIs. More than four-fifth (83.2%) of respondents chose "all" when asked about universal precautions, more than half (57.1%) indicated that frequent and proper hand washing is the best way to prevent the spread of infe"tio", respiratory tract infections are the most frequent hospital HAI, followed by urinary tract infections by less than half (42.9%) and more than half (32.3%), and less than half (42.9%) indicated that 20 seconds is the minimum amount of time needed for hand washing. Almost everyone (93.8%) disagrees that it is necessary to wash one's hands before coming into touch with a patient if they are not obviously filthy. Participants responded most frequently to questions about having a positive attitude about HAIs. Strongly agreed upon by nearly three-quarters (71.4%) of respondents, somewhat agreed upon by less than one-fourth (19.3%), and strongly agreed upon by more than four-fifth (88.8%) of respondents, questions regarding needle-stick injuries at work should be immediately reported to the relevant authority. HCWs are aware that patients expect them to wash their hands before touching them, which is voted as strongly agree by two-thirds (66.5%), the duration of hand washing affecting the outcome of preventing the spread of infection is voted as strongly agree by more than half (59.5%), pre and post exposure prophylaxis decreases HAI is voted as strongly agree by almost two-thirds (64.6%), and universal precautions reducing the risk of contamination is voted as strongly agree by more than fourth-fifth (83.2%), wearing PPE during sample collection of COVID-19 prevents from transmission of infection is voted as strongly agree by almost three-fourth (74.5%). More than one-third (34.2%) of participants agreed that N95 masks

should be discarded after each use, while one-fourth (41, 25.5%) disagreed. Finally, more than three-quarters (77%) of participants strongly agreed that eye protection should be worn at all times when conducting procedures that produce splashes or aerosols. (Sai Subhakar Desu, 2021)

2.10. **Knowledge Of Infection Control Practices Among Intensive Care Nurses in A Tertiary Care Hospital** by

Kanwalpreet Sodhi, Anupam Shrivastava, Muktanjali Arya

and Manender Kumar. An online survey with forty multiple-choice responses and ten queries was handed out to 100 nurses working in our hospital's intensive care units. Percentages were allocated to the responses. 100 nurses on staff completed the poll in total. 82 junior nurses, possessing between 0 and 5 years of know-how. According to their years of experience, nursing professionals' overall knowledge of infection control procedures was rated as excellent when the questionnaire received >90% of positive reactions, attractive when >80-90% of encouraging responses, average when >70% of optimistic responses, and below standard when >70% of favourable responses were received. 40% of the nursing staff had median awareness, 18% had below-average awareness, and 37% of the nurses had useful general knowledge. Of the nurses, just 5% had outstanding knowledge. Compared to less experienced nurses, more experienced nurses exhibited better awareness of various infection control techniques. In general, 40% of nurses with an average amount of experience and 60% of those with more than eight years had good knowledge of infection control procedures. With 5-8 years of experience, 69% of the nurses-in-charge possessed good knowledge, and 31% possessed mediocre knowledge. Between 6% and 30% of junior nurses with less than five years of experience demonstrated outstanding understanding of infection control practises. Good knowledge was represented by 5%, average knowledge by 41.5%, and below average knowledge by 22%. The level of familiarity the nursing staff has with various infection control strategies, including hand washing, common precautions, precautions based on transmission, care packages, and general infection control strategies. The nurses addressed the questions about hand hygiene in an appropriate manner, with 23% of them displaying outstanding, 32% favourable, 34% average, and just 11% below poor understanding. 9% of

the staff nurses exhibited superior knowledge of general and transmission-based precautions. 22% had information that was below a typical basis, 22% had knowledge that was good, and 47% had ordinary comprehension. Based on the responses to the care bundles questions, 31% had below-average knowledge. In terms of general infection control techniques, only 2% of the nurses had excellent knowledge, compared to 24% who had good comprehension, 63% whose had average perception, and 11% who had below mediocre intelligence. It should be noted that 55% of the nurses gave outstanding or excellent feedback demonstrates the nurses' high degree of understanding of hand cleanliness. A large proportion of nurses reported having a basic understanding of several infection control strategies. (Kanwalpreet Sodhi, 2013)

CHAPTER- 3

RESEARCH METHODOLOGY

CHAPTER- 3

RESEARCH METHODOLOGY

Research methodology is a way of structured and logical representation of a research problem. It specifies how a researcher intends to carry out their research. It defines the method to reach to the solution of the research problem that has been undertaken for the purpose of the study. Research methodology of the study is as follows.

3.1. Study Design:

The study utilized a cross sectional design. A cross-sectional study looks at data at a single point in time. This kind of research can be used to describe the characteristics of a community.

The study adopted cross sectional design as it focused on three variables which is knowledge, attitude and perception of employees of the organization at one point of time. This method will help find relationship between the perception and knowledge and help bring up solutions to improve both variables at the same time.

3.2. Study Setting:

The study is being carried out at the Daya General Hospital Limited in Thrissur, Kerala, a 250-bed facility that provides a wide range of services, including advanced neurosurgical procedures, orthopaedics, knee replacement surgery etc.

3.3. Universe:

All employees of Daya General Hospital Limited

3.4. Population:

All clinical employees of Daya General Hospital Limited

3.5. Duration of the Study:

The study was conducted from 20th Feb 2023 to 19th May 2023, a period of three months.

3.6. Sample Size:

Number of samples: 150

Inclusion criteria:

- All clinical employees of Daya General Hospital Limited
- Employees who are willing to participate in the study.
- Employees who are available during the study period

Exclusion criteria:

- All non-clinical employees of Daya General Hospital Limited
- Employees who are not willing to participate in the study.
- Employees who are not available during the study period

3.7. Sampling Technique:

Convenience sampling

- Convenience sampling is a prevalent non-probability sampling technique that involves selecting samples from the population that is easy to access. At Daya General Hospital, there are 398 nurses in total from which 150 nurses are selected on random basis. Since the study is conducted for a period of three months, 50 employees are selected each month and data is collected accordingly.

3.8. Data Collection Procedure:

3.8.1. Primary data:

- Questionnaire:
 - The questionnaire is self-constructed and is approved by hospital statistician.
 - The questionnaire consists of a total of 24 questions. First 4 questions allow collecting demographic data which includes name, department, employee ID and vaccination status. Then 10 questions are formulated to assess the knowledge of clinical staff and last 10 questions assess the attitude and perception of clinical staff.
 - The questionnaire is distributed through Google forms.
- Personal interview
 - Personal interview mode is used only in the situations where an employee cannot use Google forms for the purpose of data collection.

- Observation
 - Observation mode is used to ensure that the staff are trained and made aware of infection prevention and control techniques through routine training classes and sessions.

3.8.2. Secondary data:

Secondary data is used for literature review, discussion, and formulating questionnaire. Types of secondary data used are:

- Journals
- Articles
- Research papers
- Internet

3.9. **Pilot study:**

Pilot study is conducted to evaluate the feasibility of crucial components in a small scale for the study. For the main study to be more effective and of higher quality, a pilot study is crucial. It is carried out to evaluate any bias and get rid of the questionnaire's limitations. A pilot study was conducted by circulating the questionnaire to 25 employees in Daya General Hospital to check the viability of the questions. It was found that the questions were clear and was conveying the same idea to everybody. The questionnaire was then approved by infection control officer and hospital statistician. Since there was no change made in the questionnaire for data collection, the data collected for pilot study was included to analyse for the study.

Number of data collected during pilot study: 25.

3.10. **Data Analysis procedure:**

3.10.1. Hypothesis:

H₀: Knowledge is independent of perception on waste disposal.

H₁: Knowledge is dependent on perception on waste disposal.

H₀: Knowledge is independent of perception on needle stick injury.

H₂: Knowledge is dependent on perception on needle stick injury.

H₀: Knowledge is independent of perception on PPE.

H₃: Knowledge is dependent on perception on PPE.

H₀: Knowledge is independent of perception on Hand Hygiene.

H₄: Knowledge is dependent on perception on Hand Hygiene.

3.10.2. Classification:

Apart from the demographic questions, the questionnaire is subcategorized into two parts: knowledge and perception with 10 questions each. The employees are assessed mainly on the topics waste disposal, needle stick injury, hand hygiene, usage of PPE (Personal Protection Equipment) etc.

3.10.3. Tabulation:

Three pointer rating scale classification is used to create questionnaire for data collection process. When the mass of data has been assembled by using numbers, the data was coded, and the core value had been given to the scale. The highest positive response was given 0 and the most negative response was coded as 2. Following were the codes:

Agree – 0

Neutral- 1

Disagree- 2

3.11. Method of Calculation:

The coded data were subjected to chi- square analysis and the rest of the data is subjected to percentage analysis. A score value had been given to the scale.

- Chi-square
 - Karl Pearson chi-square analysis was used to measure the degree of linear relationship between two variables i.e.to find out the relationship between knowledge and perception of employees on control and prevention of nosocomial infection. The following formula were used for calculating the Karl Pearson's chi-square analysis:

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

Here,

X^2 : Chi- Square

O_i : Observed value

E_i : Expected Value

- Percentage
 - Data obtained for analysis is analysed through percentage analysis and the formula used for analysis is given below.

$$\text{PERCENTAGE} = (\text{number of responses} \div \text{total no. respondent}) \times 100$$

3.12. Report Writing:

Six chapters constituted the report. The introduction is covered in the first chapter. The review of the literature is the subject of the second chapter. The methodology is covered in the third chapter. The fourth chapter, titled “Results,” covers the analysis and interpretation. The study’s discussions and recommendations are provided in the fifth chapter. The conclusion can be read in the sixth chapter.

3.13. Operational Definition:

An adverse reaction to the presence of infectious pathogens or their toxins that was absent upon admission to the acute care facility causes a localised or systemic disease known as a healthcare-associated infection.

- 1. Infection-**An infection is the result of organisms infecting the body and spreading there. Anywhere in the body, an infection has the ability to begin and spread. Infections with microorganisms are the result. Viral infections are caused by viruses.
- 2. Nosocomial infection-** Nosocomial infections represent a specific class of infectious illnesses that can only be contracted in a healthcare environment. They are also known as infections linked to treatment as well as hospital acquired illnesses. The infection must become apparent at least 48 hours after admission for it to be deemed nosocomial; it cannot already be present. These infections run the danger of bringing about potentially fatal side effects including sepsis.

- 3. Hospital infection control-** Infection control is the management and prevention of the spreading of infections with the main objective of reducing infection rates in hospitals and other healthcare facilities. An infection control program's main objective is to stop and stop the transmission of infections. To prevent the propagation of infection, different precautions require being taken depending on the microorganism.
- 4. Standard precautions-** Standard Precautions include
- Hand Hygiene
 - Use of PPE
 - Respiratory and cough etiquette
 - Safe use of sharps
 - Safe injection practices
 - Sterile instruments and devices
 - Clean and disinfected environment
- 5. Hand hygiene-** Hand hygiene is a hand cleaning technique that dramatically reduces the likelihood of pathogens (dangerous germs) on the hands. Hand hygiene is one of the most essential prophylactic practises for minimising the risk of infection transmission among patients and healthcare staff. The three approaches offered are social hand decontamination, antiseptic hand decontamination, and surgical scrub treatment.
- 6. Needle stick injury-** Needles that accidentally penetrate the skin with a needle can cause needle stick injuries. Accidents involving needles are a possibility for anyone who work with hypodermic syringes and other needle-related instruments. A harm could happen whenever a person uses, disintegrates, or disregards a needle. Unsafely discarded needles could be lying in trash or clothing, where they could injure other workers if they mistakenly come into contact with them. These wounds are a special conduit for the transmission of viruses transmitted by blood. Concerns include hepatitis B, hepatitis C, HIV, which causes AIDS (Acquired Immune Deficiency Syndrome), and other hepatitis viruses.

3.14. Limitations of study:

The current study titled, “A Cross Sectional Study on Knowledge, Attitude and Perception of Healthcare Workers in Control and Prevention of Hospital Associated Infections” was conducted with various time constraints and limited resources. If the research is to be performed yet again, an array of restrictions must be taken into account. Some of the limitations have been listed below:

- The study is limited to one hospital only. The study only assesses the knowledge, attitude, and perception of employees of Daya General Hospital only.
- Only clinical employees are included in the study and non-clinical employees are not part of the study.
- The study is conducted over a period of three month. Only the employees who were present during the month of March, April and May are included in the study.
- The study has not included if the questionnaire is not answered completely.

3.15. Ethical Considerations:

- The project was conducted at Daya General Hospital, Limited. Informed consent was received from Hospital Quality Manager, Ms Krishnaprabha Madhu and the project was conducted under Hospital Infection Control Officer and Clinical Microbiologist, Dr Kavya P. The questionnaire and analysis were approved by Hospital Statistician and Assistant Manager, Ms Archana.
- The participants of the study were nurses/clinical staff of Daya General Hospital, Limited
- The report is written with utmost care of data secrecy and confidentiality.

CHAPTER- 4

RESULT

CHAPTER- 4

RESULT

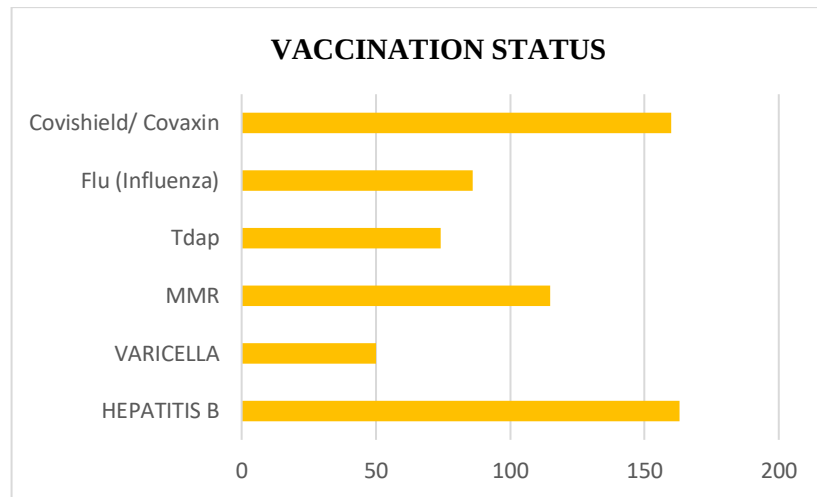
For analysis, nursing staff of Daya General Hospital, Limited were chosen at random and a questionnaire was distributed among them. 25 employees were selected for the pilot study from which the data collected was found to be free from mistakes and bias. The main study included data from 150 employees, as per the sample size. Both data collected during pilot study and main study are included for final analysis.

Vaccination details of employees collected by HR include Hepatitis B, Varicella, MMR, Tdap, Flu (Influenza) and Covishield/Covaxin. Vaccination status of 175 employees (staff nurses) are shown below:

Table: 4.1

VACCINATION STATUS		
Vaccine	Number	Percentage
Hepatitis B	163	93.10%
Varicella	50	28.60%
MMR	115	65.70%
Tdap	74	42.30%
Flu (Influenza)	86	49.10%
Covishield/ Covaxin	160	91.40%

Figure: 4.1



93.10% of 175 employees are Hepatitis B vaccinated and 91.40% of employees are Covishield/Covaxin vaccinated but only 28.60% employees are Varicella vaccinated. Flu vaccine and Tdap vaccine are taken only taken by around 50% of employees and MMR by 65.70%.

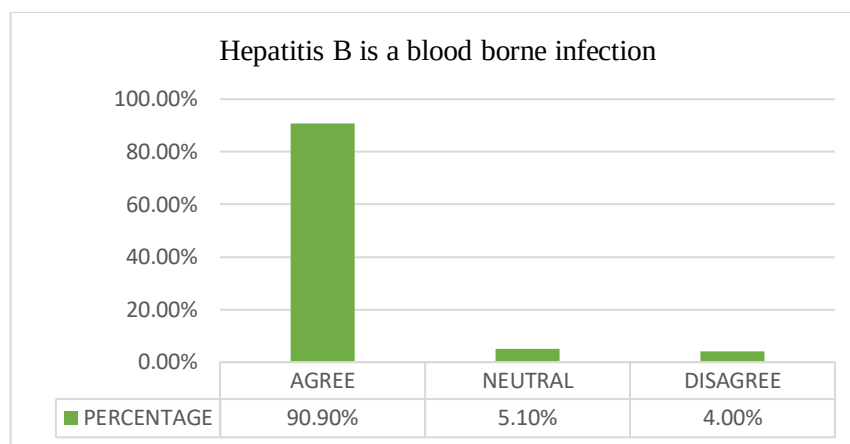
KNOWLEDGE ASSESSMENT:

There was a total of 10 questions assessing the knowledge of clinical employees on nosocomial infection and its control and prevention.

Table: 4.2

Hepatitis B is a blood borne infection		
Parameter	Number	Percentage
Agree	157	90.90%
Neutral	9	5.10%
Disagree	7	4.00%

Figure:4.2

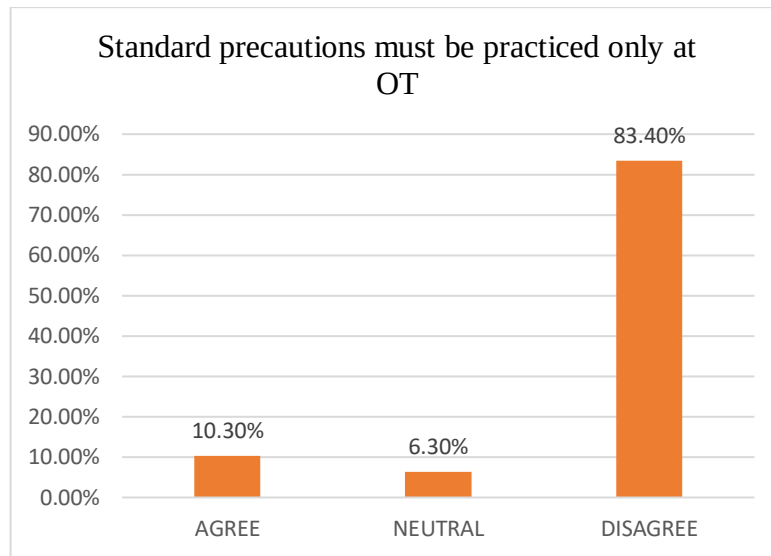


The employees were asked if Hepatitis B is a blood borne infection and 90.90% of the employees selected it right as “Agree” which means they have good knowledge about Hepatitis B being a blood borne infection.

Table: 4.3

Standard precautions must be practiced only at OT		
Parameter	Number	Percentage
Agree	18	10.30%
Neutral	11	6.30%
Disagree	146	83.40%

Figure: 4.3

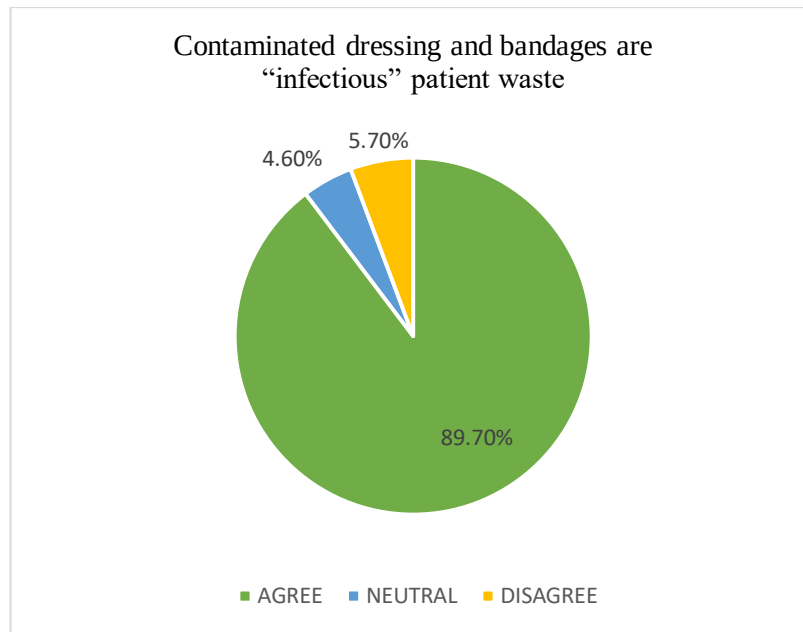


When employees were asked about the standard precautions, 83.40% had correct knowledge but nearly 17% is unaware about what standard precautions is.

Table: 4.4

Contaminated dressing and bandages are “infectious” patient waste		
Parameter	Number	Percentage
Agree	157	89.70%
Neutral	8	4.60%
Disagree	10	5.70%

Figure: 4.4

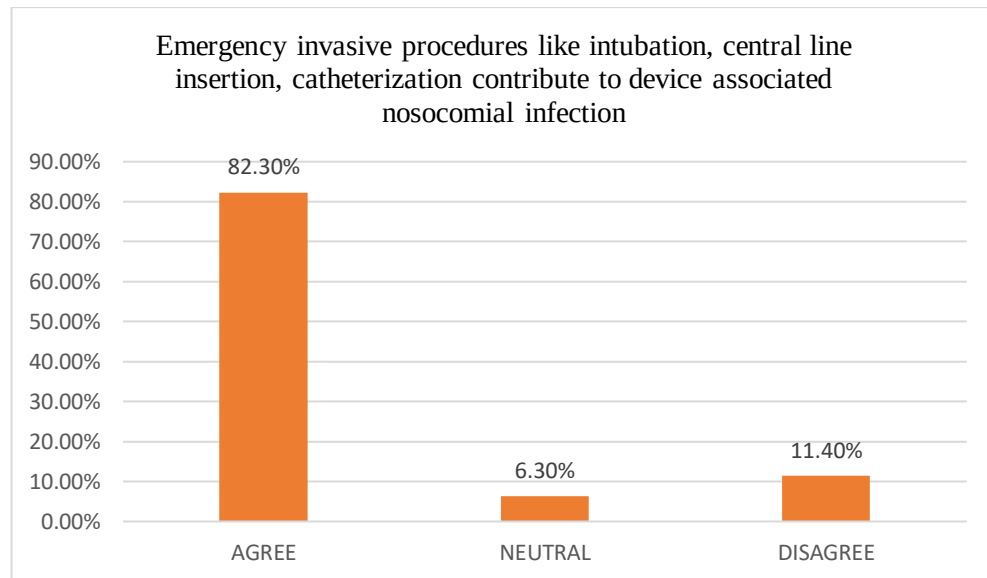


Nearly 90% of employees are aware of the fact that contaminated dressings and bandages are infectious patient waste, and they are disposing of it correctly. Only 10% of employees attempted this question wrong.

Table: 4.5

Emergency invasive procedures like intubation, central line insertion, catheterization contribute to device associated nosocomial infection		
Parameter	Number	Percentage
Agree	144	82.30%
Neutral	11	6.30%
Disagree	20	11.40%

Figure: 4.5

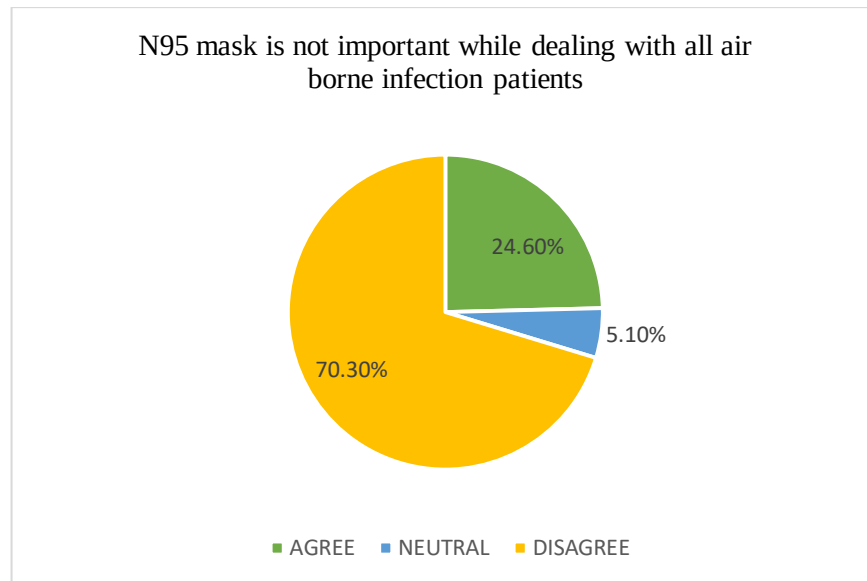


Device associated nosocomial infection is the most reported kind of infection. 82.30% agree to the fact that emergency invasive procedures contribute to device associated nosocomial infection and nearly 18% of the nursing staff are unwilling that emergency invasive procedures could contribute to nosocomial infection.

Table: 4.6

N95 mask is not important while dealing with all air borne infection patients		
Parameter	Number	Percentage
Agree	43	24.60%
Neutral	9	5.10%
Disagree	123	70.30%

Figure: 4.6

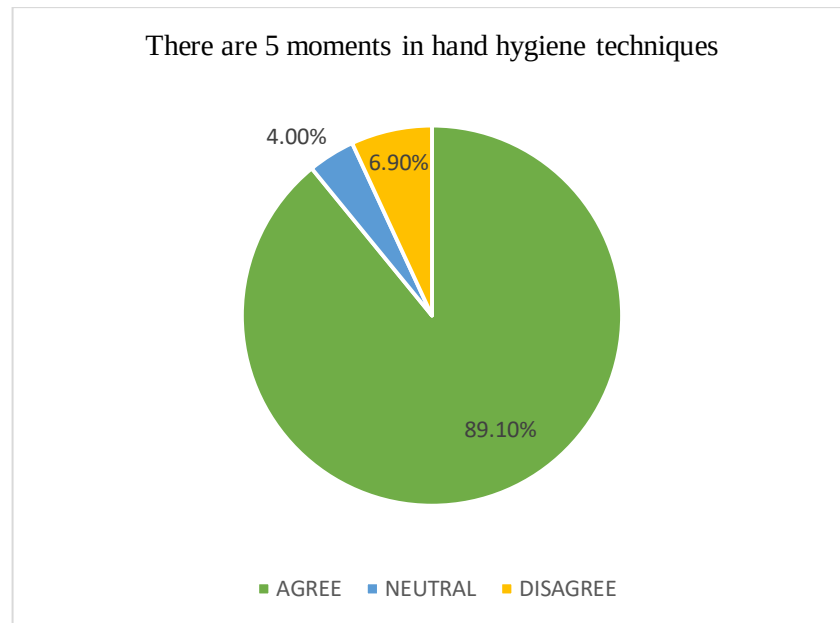


In this question, nearly 30% of employees does not have the knowledge of using N95 masks while dealing with all air borne infection patients.

Table: 4.7

There are 5 moments in hand hygiene techniques		
Parameter	Number	Percentage
Agree	156	89.10%
Neutral	7	4.00%
Disagree	12	6.90%

Figure: 4.7

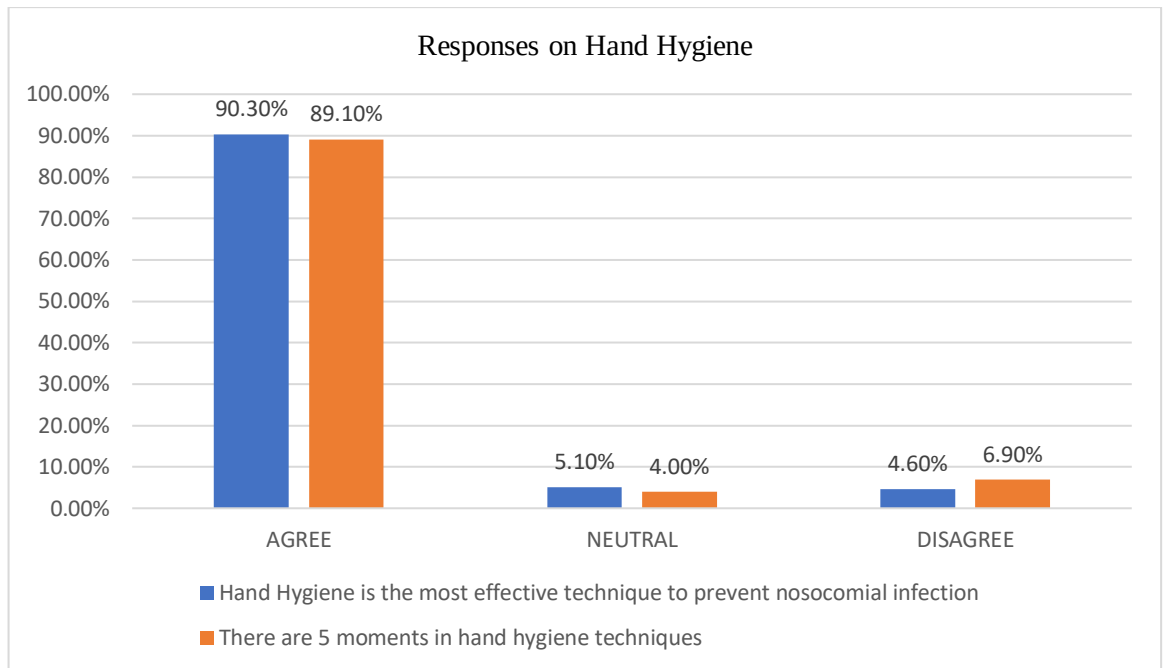


Before touching the patient, before a procedure, after a procedure or body fluid exposure danger, after touching the patient, and after touching the patient's surroundings are the five times to wash your hands. There are five key moments for proper hand hygiene, which are known by about 90% of staff.

Table: 4.8

Parameter	Hand Hygiene is the most effective technique to prevent nosocomial infection	There are 5 moments in hand hygiene techniques
Agree	90.30%	89.10%
Neutral	5.10%	4.00%
Disagree	4.60%	6.90%

Figure: 4.8

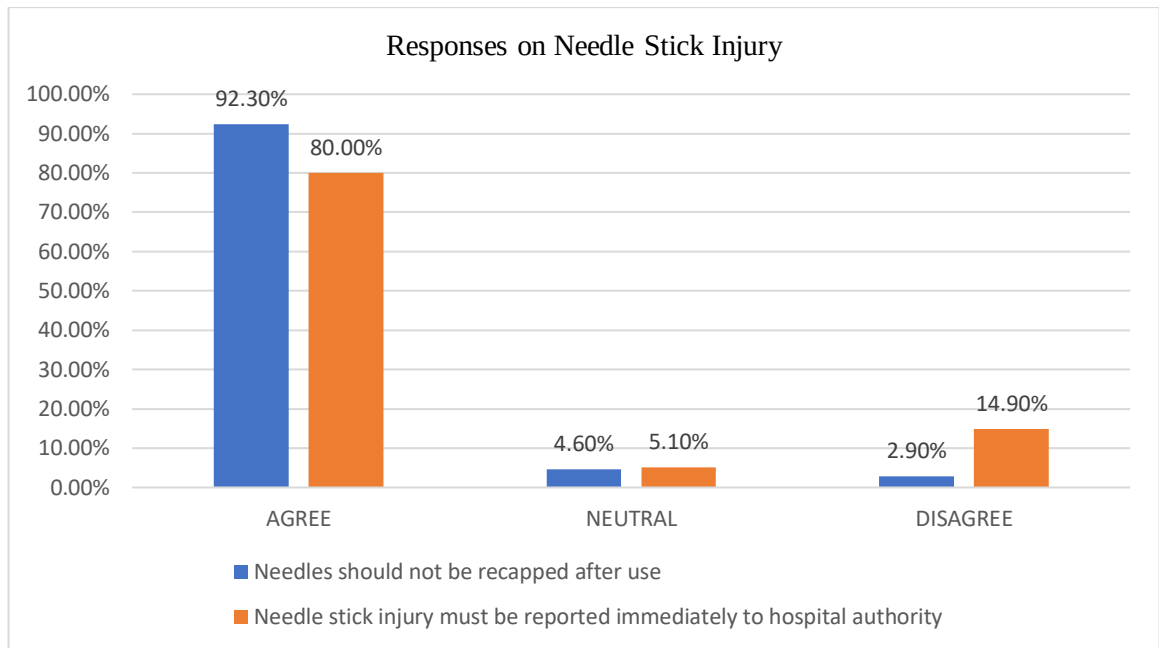


On a comparative study on “Hand Hygiene is the most effective technique to prevent nosocomial infection” and “There are 5 moments in hand hygiene techniques”, employees have nearly equal knowledge on hand hygiene on the whole.

Table: 4.9

Parameter	Needles should not be recapped after use	Needle stick injury must be reported immediately to hospital authority
Agree	92.30%	80.00%
Neutral	4.60%	5.10%
Disagree	2.90%	14.90%

Figure: 4.9



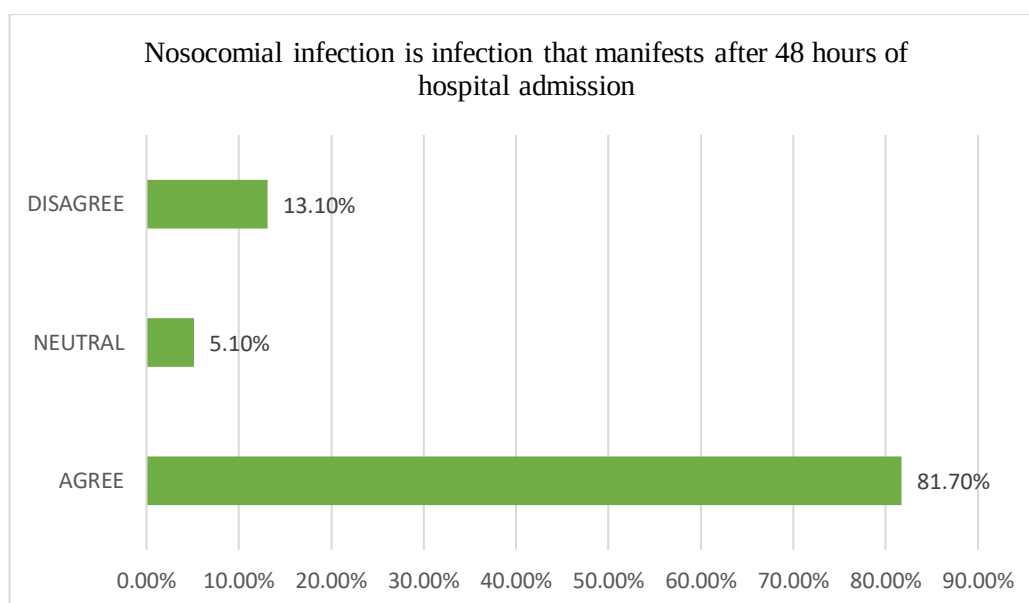
There is a variation in the knowledge of needle stick injury. 92.30% employees know that needles should not be recapped after use but only 80% of employees know the fact that Needle stick injury must be reported immediately to the hospital authority.

PERCEPTION ASSESSMENT:

Table: 4.10

Nosocomial infection is infection that manifests after 48 hours of hospital admission		
Parameter	Number	Percentage
Agree	143	81.70%
Neutral	9	5.10%
Disagree	23	13.10%

Figure: 4.10

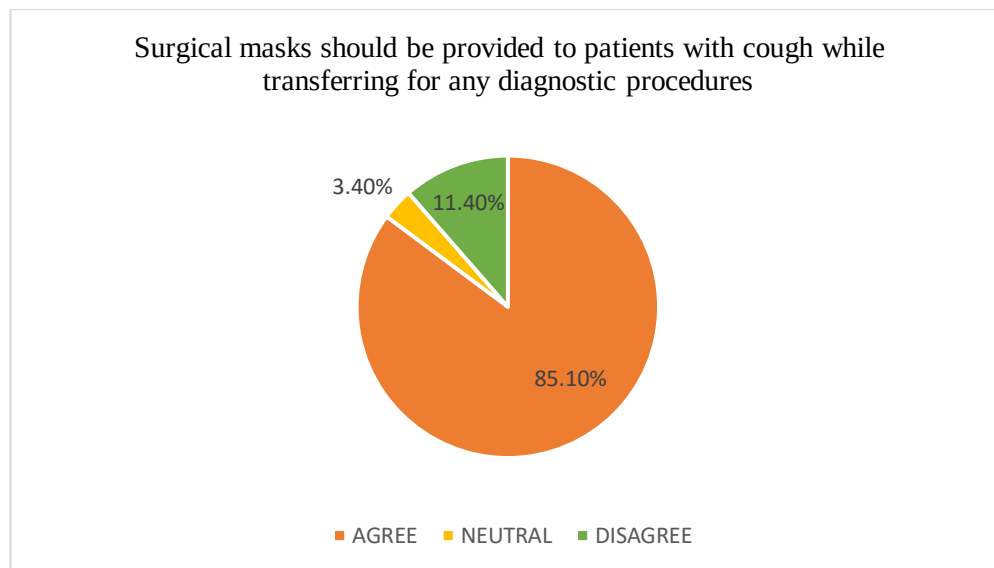


18.20% employees are unaware of the fact that nosocomial infection is the infection that manifests after 48 hours of hospital admission. The perception of nosocomial infection and its prevention and control plays a major role in reduction of nosocomial infection throughout the hospital.

Table: 4.11

Surgical masks should be provided to patients with cough while transferring for any diagnostic procedures		
Parameter	Number	Percentage
Agree	149	85.10%
Neutral	6	3.40%
Disagree	20	11.40%

Figure: 4.11

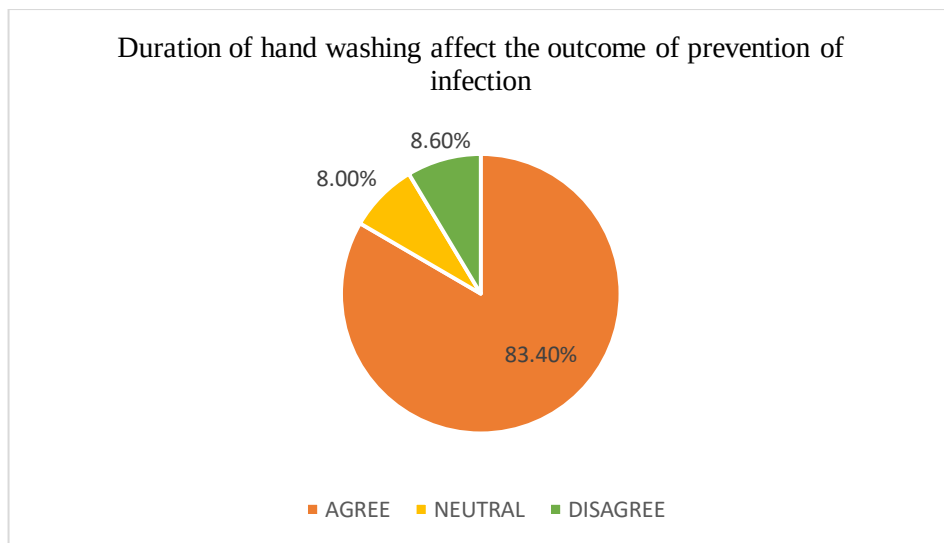


Only 85.10% of employees are sure about the fact that surgical masks should be provided to patients with cough while transferring for any diagnostic procedures.

Table: 4.12

Duration of hand washing affect the outcome of prevention of infection		
Parameter	Number	Percentage
Agree	146	83.40%
Neutral	14	8.00%
Disagree	15	8.60%

Figure: 4.12

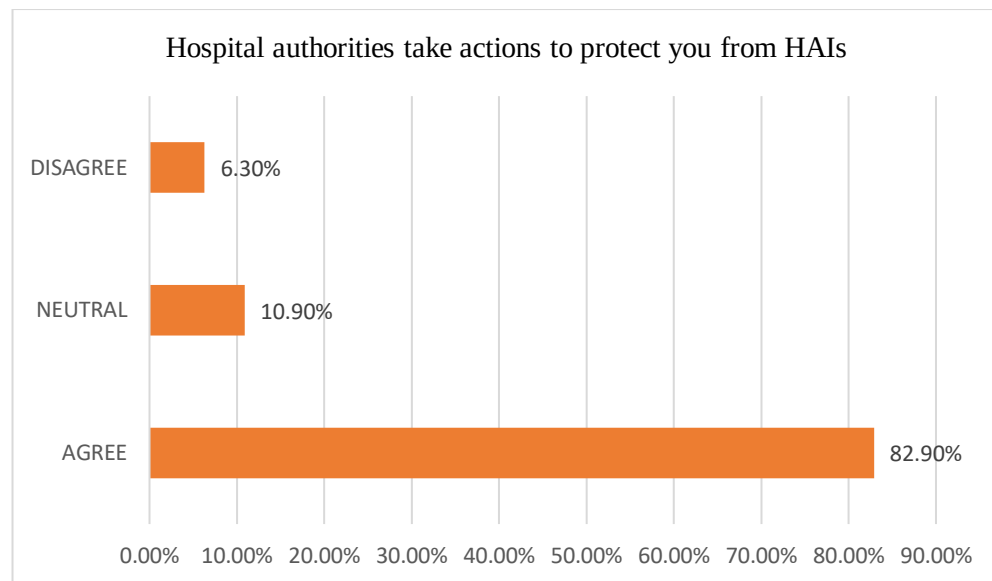


Here is a gap when employees miss hand hygiene opportunities between patients. It can be because of various reasons like patient load, shift load, staff's perception, or attitude towards hand hygiene etc.

Table: 4.13

Hospital authorities take actions to protect you from HAIs		
Parameter	Number	Percentage
Agree	145	82.90%
Neutral	19	10.90%
Disagree	11	6.30%

Figure: 4.13

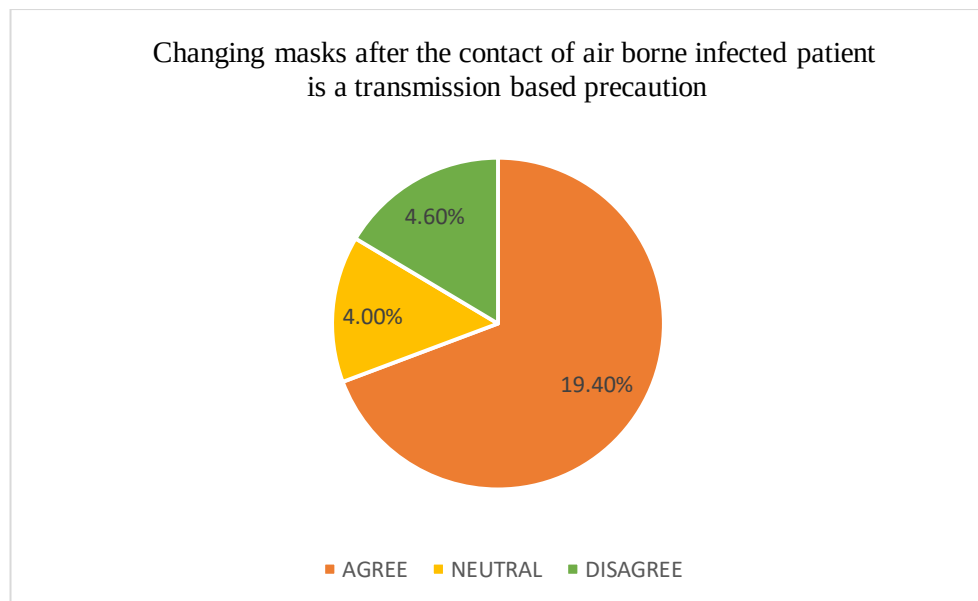


82.90% of 175 employees agree to the fact that hospital authorities take action to protect them from hospital acquired infection. 10.90% of employees are neutral about it and 6.30% employees do not agree to the same.

Table:4.14

Changing masks after the contact of air borne infected patient is a transmission-based precaution		
Parameter	Number	Percentage
Agree	160	90.40%
Neutral	7	4.00%
Disagree	8	4.60%

Figure: 4.14

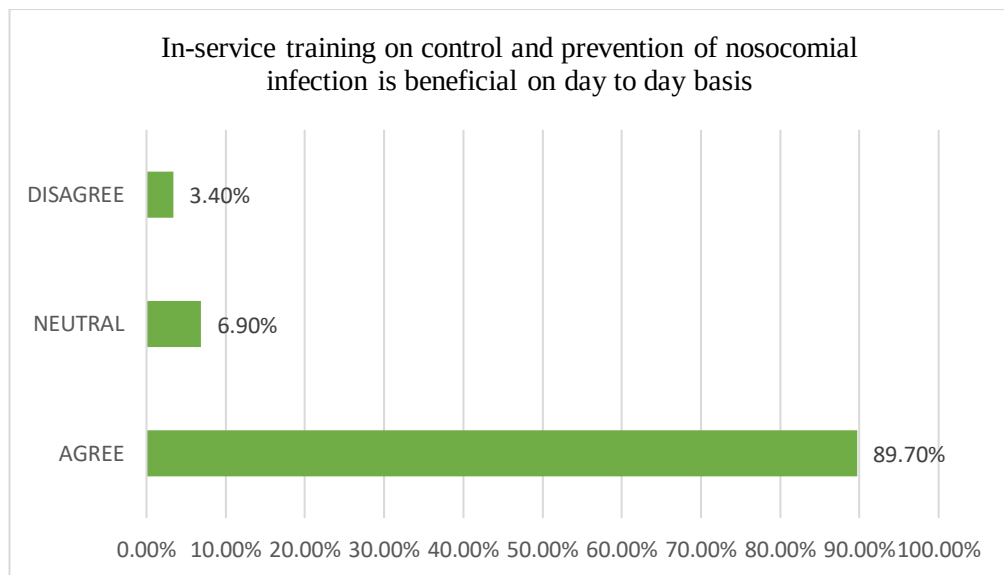


90.40% of employees agree to the fact that changing masks after the contact of air borne infected patient is a transmission-based precaution. 4.00% are neutral about the fact and 4.60% of employees disagree about the same.

Table 4.15

In-service training on control and prevention of nosocomial infection is beneficial on day-to-day basis		
Parameter	Number	Percentage
Agree	157	89.70%
Neutral	12	6.90%
Disagree	6	3.40%

Figure: 4.15



89.70% of employees are in favor of in-service training on control and prevention of nosocomial infection as they think it is beneficial on day-to-day basis.

CHI-SQUARE ANALYSIS:

H₀: Knowledge is independent of perception on waste disposal

H₁: Knowledge is dependent on perception on waste disposal

Table: 4.16

		Yellow bins are used for disposing infectious waste			Total	df	Chi-square value
		Agree	Neutral	Disagree			
Waste segregation is important during disposal	Agree	158	0	2	160	4	57.535 ^a
	Neutral	8	2	2	12		
	Disagree	1	1	1	3		
Total		167	3	5	175		

Calculated P- Value: 0

Inference:

We set the level of significance $\alpha=0.05$.

Since the p-value is less than α , we reject the null hypothesis. There is a direct and significant relation between knowledge and perception of waste disposal.

Hence, we conclude that knowledge is dependent on perception on disposal of waste.

H₀: Knowledge is independent of perception on needle stick injury

H₂: Knowledge is dependent on perception on needle stick injury.

Table: 4.17

		Needles should not be recapped after use			Total	df	Chi- square value
		Agree	Neutral	Disagree			
Needle stick injury result in transmission of blood borne virus	Agree	135	3	2	140	4	19.814 ^a
	Neutral	6	3	0	9		
	Disagree	23	3	0	26		
Total		164	9	2	175		

Calculated P-Value: 0.000543339

Inference:

We set the level of significance $\alpha=0.05$.

Since the p-value is less than α , we reject the null hypothesis. There is a direct and significant relation between knowledge and perception on needle stick injury.

Hence, we conclude that knowledge is dependent on perception on needle stick injury.

H_0 : Knowledge is independent of perception on PPE.

H_3 : Knowledge is dependent on perception on PPE.

Table: 4.18

		N95 mask is not important while dealing with all air borne infection patients			Total	df	Chi-square value
		Agree	Neutral	Disagree			
Patient diagnosis influence your decision in using PPE	Disagree	100	7	16	123	4	10.574 ^a
	Neutral	5	3	1	9		
	Agree	36	2	5	43		
Total		141	12	22	175		

Calculated P-Value: 0.031792727

Inference:

We set the level of significance $\alpha=0.05$.

Since the p-value is less than α , we reject the null hypothesis. There is a direct and significant relation between knowledge and perception on PPE.

Hence, we conclude that knowledge is dependent on perception on PPE.

H_0 : Knowledge is independent of perception on Hand Hygiene

H_4 : Knowledge is dependent of perception on Hand Hygiene

Table: 4.19

		Hand Hygiene is the most effective technique to prevent nosocomial infection			Total	df	Chi-square value
		Agree	Neutral	Disagree			
Hand hygiene techniques is carried out when there is High touch surface exposure	Agree	127	4	27	158	4	21.692a
	Neutral	5	3	1	9		
	Disagree	6	0	2	8		
Total		138	7	30	175		

Calculated P-Value: 0.000230762

Inference:

We set the level of significance $\alpha=0.05$.

Since the p-value is less than α , we reject the null hypothesis. There is a direct and significant relation between knowledge and perception on Hand Hygiene.

Hence, we conclude that knowledge is dependent on perception on Hand Hygiene.

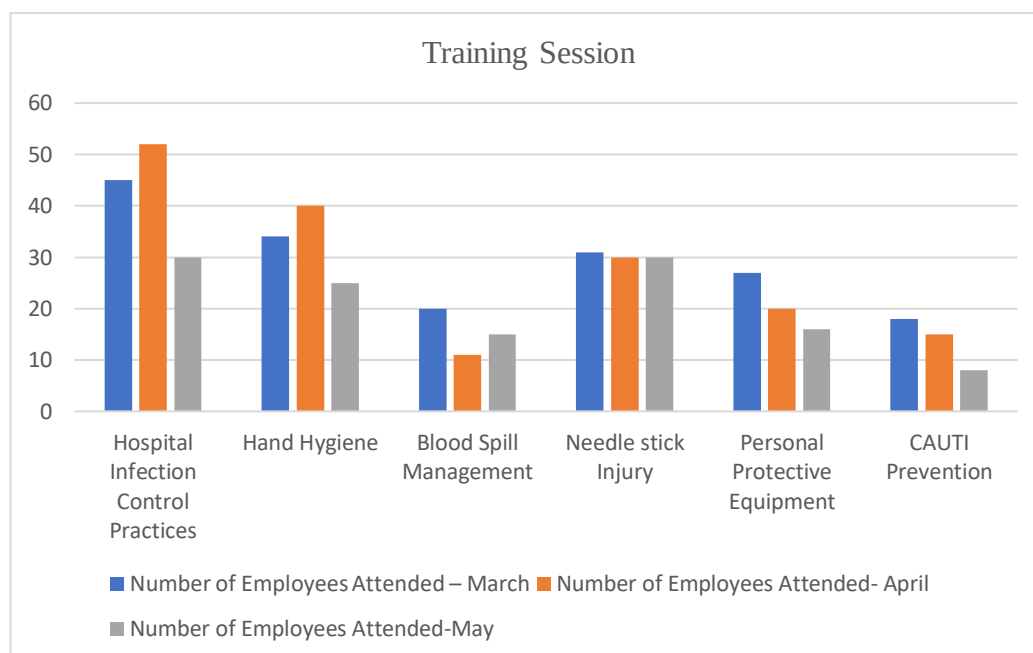
Training Observation:

Since the third objective of the study is to ensure staff are trained and made aware of infection prevention and control techniques. Below shown are the classes taken by Infection Control nurse every month.

Table: 4.20

Name of the Training Session	Number of Employees Attended – March	Number of Employees Attended- April	Number of Employees Attended-May
Hospital Infection Control Practices	45	52	30
Hand Hygiene	34	40	25
Blood Spill Management	20	11	15
Needle stick Injury	31	30	30
Personal Protective Equipment	27	20	16
CAUTI Prevention	18	15	8

Figure: 4.16



The table shows that no training has been attended by more than 50-55 people, which is less than one-fourth of the total nursing staff in the organization. This is somewhere improvement has to be made. Here is an assessment of the attitude of employees towards improving or refreshing their knowledge of nosocomial infection, its prevention and control.

Hence, the analysis concludes that knowledge is completely dependent on perception on control and prevention of nosocomial infection. Since every chi-square analysis proves so, it means that if employees are given good education or imparted knowledge in time in the right manner with proper post-assessment, they will have the right perception about nosocomial infection.

CHAPTER- 5

DISCUSSION

CHAPTER- 5

DISCUSSION

1. Bundle care awareness can be given to make the tool (bundle checklist) effective. This can be done by giving training on CAUTI, CLABSI, VAP and SSI commonly to every member of staff. Bundles are used as in the bundle care checklist drafted by CAHO (Consortium of Accredited Health care Organization).
2. Apart from nursing staff, employees working in linen and laundry, dietary, mortuary and other utility services can be educated about hospital infection control and its policies. Some examples for departments to whom training can be provided on topics which would cater to infection control inside the hospital, for housekeeping management, training can be provided on importance and ways of cleaning high touch surface areas (monitoring equipment, hemodialysis machine, doorknobs, elevator buttons, telephone, call bells, bedrails, light switches, computer keyboards, wall areas, edges of privacy curtains etc.) and low touch surface areas (walls, ceilings, mirrors, window handles etc.), engineering personnels can be given training on water management, HVAC, theatre environment, protective environment rooms, facility management etc., linen and laundry team can be trained on linen collection, loading sorting, storage, and delivery dirty linen, soiled linen, infected linen, and radioactive linen and decontamination, disinfection and washing of the same, kitchen sanitation and food handling can trained on shelf life or perishable and non-perishable items etc. and mortuary staff need to be trained to monitor pest control, temperature management etc.
3. “Hand Hygiene” can be made as mantra to reduce hospital acquired infection as hand hygiene alone can reduce 35-40% spread of hospital acquired infection. This can be done by encouraging “Hand Hygiene” at every possible opportunity by giving the nursing staff tasks and activities. Employee least missing hand-hygiene opportunities can be awarded. Hand sanitizers and alcohol-based hand rubs are provided at all stations and trays. Those must be used rationally as and when required. Excess use of sanitizers can alter the skin texture and therefore hand care can also be educated in “Hand Hygiene” sessions. According to CAHO (Consortium of Accredited Health care Organization), hand care can be done by tips like Use a protective hand cream or lotion on a daily basis to protect your hands. Wait until your hands are completely dry after washing or hand rubbing before

putting on gloves. Maintain short natural nails and dry your hands with paper towels rather than cloth or blow dryers.

4. Continuous proper channel of education program is the most efficient way to spread knowledge and awareness on prevention and control of nosocomial infection to all staff and nurses catering to specific departments which needs advance knowledge on prevention techniques. The training calendar must be prepared on a monthly basis in advance and must be displayed or shared with all healthcare providers working in the hospital so that they can decide if they want to be trained in a specific topic. Training attendance has to be marked every session and proper assessment can be conducted from time to time to ensure that employees are gaining knowledge and this way the instructor can know the weak areas of employees. If a particular class has to be attended by specific employees that must also be displayed. Spontaneous need-based training can be conducted for specific employees to deliver much more quality healthcare.
5. Encouraging peer-to-peer learning is another best method to educate ways to prevent nosocomial infection. This can be done by identifying good work of employees who take valid and visible steps to prevent infection from spreading and expressing and encouraging other employees by telling their experience or stories.
6. Any task done proactively can have a better outcome. Thus, it is important to push employees out of their comfort zone and take actions to prevent nosocomial infection from spreading proactively. This can be done by giving them targets, secret inspections, recognitions etc. to encourage them to act proactively towards controlling the spread of nosocomial infection from one patient to other. At an initial stage they can be assessed on their compliance with specific transmission-based precaution like “Contact” being the most common transmission route, employees must wear gloves and gown whenever they are in contact with that specific patient. If the infection is transmitted through “Droplet”, which carry infectious pathogens over a small distance, the employees must, by default, wear surgical masks and if the infection is “Airborne”, employees must have the proactiveness to put on N-95 Respirators and to identify if prevention requires the use of special air handling and ventilation system- AIIR (Airborne Infection Isolation Rooms). Knowledge on usage of N95 masks while attending a patient who has an air-borne infection is poor among nursing staff, awareness can be provided on safety equipment to be used while dealing with infectious patients.

7. Systematic and periodic evaluation play a major role in getting an idea about employee's knowledge, attitude and perception on control and prevention of nosocomial infection. The evaluation must be made both practical and theoretical, which will allow the instructor to get a clear picture of what areas the employees can be trained in more. This study has assessed employees on theoretical basis and this study concludes that employees lack knowledge on standard precaution which is the following and has to be followed universally.
- Hand Hygiene- Hand rubbing or Hand washing
 - PPE- Gloves, Gown/apron, Masks and respirators, Goggles and Face shield
 - Respiratory hygiene and cough etiquette
 - Prevention of needle stick and injuries from other sharp instruments, Patient care equipment
 - Environmental cleaning
 - Linen (Control, transportation and process used linen in a way that prevents skin and mucous membrane exposures and garment contamination, as well as the spread of diseases to other patients and/or the surroundings)
 - Disposal of Waste
8. Most importantly as employees are unaware of the fact that a needle stick injury must be reported immediately to the hospital authority, it is important to have knowledge about the reporting authorities in the hospital like Infection Control Officer or the Infection Control Nurse etc. The staff must also be aware of the risk mitigation protocol. There are tools available to identify and analyse risk like FMEA (Failure Model and Effective Analysis)
9. From the study we come to know that not all employees are fully vaccinated. Thus, it is important that they must be encouraged to get complete vaccination especially Tdap, Varicella. Hepatitis B and Flu (influenza) vaccines.
10. Organizing inter and intra hospital workshops in which employees of own hospital and other hospitals can participate or intimating employees to participate in such workshops provided by other organizations will help in expanding knowledge horizon on control and prevention of nosocomial infection.

CHAPTER- 6

CONCLUSION

CHAPTER- 6

CONCLUSION

Compared to the general population, the employees in healthcare facilities and healthcare professionals are more susceptible to infection. This occurs as a result of their ongoing exposure to infectious sources of contact. The chance of spreading a disease is increased by the number and percentage of predisposed people in healthcare settings like hospitals and primary care clinics. There are many rules and suggestions that can be followed to reduce the spread of infection among individuals, within a group, and internationally. Infection prevention and control is a global issue.

The study named **“A Cross Sectional Study on Knowledge, Attitude and Perception of Healthcare Workers in Control and Prevention of Hospital Acquired Infection”** is a study is carried out by assessing knowledge and perception along with the attitude to attend trainings of 175 healthcare workers working in Daya General Hospital, Limited, Thrissur, Kerala. A self-constructed questionnaire which contains three demographic questions and ten questions each which allows to study about the knowledge and perception of healthcare workers on control and prevention of nosocomial infection. The questionnaire was approved by the hospital statistician and infection control officer. To analyze the data collected from 175 employees in a period of three months, tools like chi square, bar charts and pie charts are used.

In a similar study, it is concluded that it is important to continue taking structured, regular, and ongoing educational programmes seriously. These programmes use a variety of strategies to sustain, advance, and address the knowledge gaps among nursing staff. It's also important to determine what influences nursing staff members' promotion of a positive attitude and view towards hand cleanliness. (Zahra GOODARZI, 2020)

224 nurses from three teaching hospitals were chosen at random for another cross-sectional study. The questionnaire was divided into three sections: demographic information, nursing staff practises, and knowledge level. Findings revealed that most participants were female, were married, (89.3%) had bachelor's degrees, (51.8%) had work experience between 11 and 20 years, and (41.1%) had intermediate or higher levels of knowledge about infection control. Additionally, the results revealed that in this field, (75.8%) performed at an intermediate level. The subjects' performance and sexual orientation were significantly correlated ($P = 0.014$). The majority of the study's nurses

had intermediate understanding of and experience with infection control, according to the results. For all nursing staff categories, a system of ongoing education must be developed. (Mozhgan Kalantarzadeh, 2014)

Similarly in this study, the investigation concludes that perception of nosocomial infection control and prevention completely determines knowledge of those topics. Since every chi-square study demonstrates this, it follows that personnel will have the correct perception of nosocomial infection provided they receive good education or are imparted knowledge over time, in the appropriate manner, and with the suitable post-assessment. Suggestions to this study include, to make that tool (the bundle checklist) effective, bundle care awareness can be distributed. This can be achieved by providing regular training on CAUTI, CLABSI, VAP, and SSI to every member of staff. Aside from nursing staff, employees in linen and laundry, dietary, mortuary, and other utility services can also be educated about hospital infection control and its policies. We can also promote the use of alcohol-based hand rubs and hand sanitizers, and we can make "Hand Hygiene" our company motto in order to lower hospital acquired infections. Encourage hand hygiene whenever you can by assigning duties and activities, maintaining a correct channel of teaching, and integrating all personnel and particular departments in the programme. Classes can be scheduled to discuss or inform people about potential risk factors in a particular department, stimulate peer-to-peer learning, and promote hand hygiene in addition to encouraging standard precaution at all times. Along with that, promote proactivity among employees by setting goals for them, evaluating their performance, offering them praise, etc. Additionally, do regular, systematic evaluations that include both theory and practise, and provide your team feedback on those evaluations. All clinical personnel should be made aware of the hospital's infection control policies, reporting procedures, and risk mitigation process. Complete immunisation, particularly Tdap and Varicella, should be encouraged. vaccinations against hepatitis B and influenza. The nursing staff lacks knowledge of how to properly use N95 masks when caring for patients who have airborne infections. Safety equipment to be used when caring for infectious patients can also be made more widely known. Housekeeping staff should also be made aware of high touch surface areas, such as monitoring equipment, haemodialysis machines, doorknobs, elevator buttons etc.

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APPENDIX

CODING USED FOR SPSS

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159	0	0	2	0	0	2	0	2
160	0	0	0	0	0	0	0	0
161	0	0	0	0	0	0	0	0
162	0	0	0	0	0	0	2	0
163	0	0	0	0	0	0	0	0

164	0	2	0	0	0	0	0	0
165	0	0	1	0	0	0	0	0
166	0	0	0	0	0	0	0	0
167	0	0	0	0	0	0	0	0
168	0	0	0	0	0	0	2	0
169	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	2	0
171	0	0	0	0	0	2	0	0
172	0	0	0	0	0	0	0	0
173	0	0	0	0	0	0	1	0
174	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0

QUESTIONNAIRE

I, Bhagyashree S, second year student of IIHMR University, Jaipur, am presently working on a project named, " **A Cross Sectional Study on Knowledge, Attitude and Perception of Healthcare Workers in Control and Prevention of Hospital Associated Infections**". To do my project work, I need the below questions to be answered. I assure you that the information provided will be kept strictly confidential and meant only for academic research purposes. Your cooperation is highly appreciated. Thank you.

Demographic

1. Name:
2. Emp id:
3. Department:
4. Vaccination status

Hepatitis B	MMR
VARICELLA	Covishield/ Covaxin
Tdap	Flu (Influenza)

Knowledge

1. Hepatitis B is a blood borne infection (Agree, Disagree, Neutral)
2. Standard precautions must be practiced only at OT (Agree, Disagree, Neutral)
3. Contaminated dressing and bandages are "infectious" patient waste (Agree, Disagree, Neutral)
4. There are 5 moments in hand hygiene techniques (Agree, Disagree, Neutral)
5. Emergency invasive procedures like intubation, central line insertion, catheterization contribute to device associated nosocomial infection (Agree, Disagree, Neutral)
6. Hand Hygiene is the most effective technique to prevent nosocomial infection (Agree, Disagree, Neutral)
7. N95 mask is not important while dealing with all air borne infection patients (Agree, Disagree, Neutral)
8. Yellow bins are used for disposing infectious waste (Agree, Disagree, Neutral)
9. Needle stick injury must be reported immediately to hospital authority (Agree, Disagree, Neutral)

10. Needles should not be recapped after use (Agree, Disagree, Neutral)

Perception

1. Nosocomial infection is infection that manifests after 48 hours of hospital admission (Agree, Disagree, Neutral)
2. Surgical masks should be provided to patients with cough while transferring for any diagnostic procedures (Agree, Disagree, Neutral)
3. Hand hygiene techniques is carried out when there is High touch surface exposure (Agree, Disagree, Neutral)
4. Duration of hand washing affect the outcome of prevention of infection (Agree, Disagree, Neutral)
5. Hospital authorities take actions to protect you from HAIs (Agree, Disagree, Neutral)
6. Patient diagnosis influence your decision in using PPE (Agree, Disagree, Neutral)
7. Changing masks after the contact of air borne infected patient is a nosocomial infection control measure (Agree, Disagree, Neutral)
8. Waste segregation is important during disposal (Agree, Disagree, Neutral)
9. Needle stick injury result in transmission of blood borne virus (Agree, Disagree, Neutral)
10. In-service training on control and prevention of nosocomial infection is beneficial on day-to-day basis (Agree, Disagree, Neutral)

Date : 19/05/2023

CERTIFICATE OF QUESTIONNAIRE VALIDATION

This is to certify that the questionnaire used for the study entitled **"A Cross Sectional Study on Knowledge, Attitude and Perception of Healthcare Workers in Control and Prevention of Hospital Acquired Infections"** prepared and submitted by Bhagyashree S has been evaluated and found valid to the required standards of scholarly research.

In view thereof, I, Archana K, Hospital Statistician have affixed my signature below as confirmation and approval I have made here to.

19-05-2023

Viyyur

Archana K


Statistician