



Research Paper

Descriptive Study to Assess the Knowledge and Awareness of Infection Control in Radiology Department in Different Hospitals of North Kashmir

Authors

Bilqueesa Mushtaq¹, Ruqiya Ramzan²

Abstract

Aim: A descriptive study to assess the knowledge and awareness of infection control in Radiology Department in different Hospitals of North Kashmir

Objective:

1. To assess knowledge of infection control in Radiology Department.
2. To assess awareness about infection control methods in Radiology Department.

Conclusion: The result from this study discloses that housekeeping staff and attendant in radiology department of different hospitals of north Kashmir had poor knowledge regarding infection control. It therefore recommended that all hospitals should have regular educational programs on infection control for all health care workers involved in the care of patients and housekeeping staff. All the hospitals should have a clearly written infection control guideline placed in strategic position in the department. There should be a regular system of monitoring infection rates as well as disseminating information which will serve as a link between the management and the health care workers.

Keywords: knowledge, infection, awareness, infection control.

Introduction

When some harmful germs start growing in our body leads to cause infection. These germs may be bacterial, viral, or fungal. These germs can start growing anywhere in body and may spread all through it ⁽¹⁾. These infectious germs are not normally present in our body. These germs damage normal cells present in our body and leads to cause infection. Because of infection signs and symptoms of illness like fever, cold, sore throat or new mouth sore, nasal congestion, stiff neck, burning or pain with urination or other health problems will appear.

When the infection will not cause any symptom, it

is known as subclinical and if infection is causing any symptoms, it is called clinically apparent. Infection sometimes remains localized and will not spread and some infections may cause spread through the blood or lymphatic vessels to become systemic (body wide)⁽²⁾.

Types of infection:

Most common type of infections found are as:

1. Viral infections

Examples are:

- Influenza (flu)
- Common cold
- Chickenpox
- polio

- human immune deficiency virus (HIV)
- measles
- herpes simplex virus(HSV)
- viral meningitis
- viral hepatitis (A, B, C, D, and E)

2. Bacterial infections

- Examples are:
- Urinary tract infection(UTI)
- Food poisoning caused by *E. coli*, *Salmonella*, or *Shigella*
- Strep throat
- Tuberculosis
- Lyme disease
- Whooping cough
- Pneumonia
- Bacterial meningitis

3. Fungal infection

- Examples are:
- Thrush
- Athlete's foot
- Ringworm
- Vaginal yeast infections (VYI)

- Fungal meningitis

4. Parasitic infections

Examples are:

- Malaria
- River blindness
- Tapeworm infection
- Toxoplasmosis
- Pubic and head lice
- Scabies⁽³⁾

Some common types of hospital acquired infection are Blood stream infection (BSI), Urinary tract infection (UTI), Pneumonia (e.g., ventilator associated pneumonia [VAP]), and also surgical site infection (SSI) ⁽⁴⁾. Healthcare associated infection are caused by pathogenic microorganisms, which can be detected in air, water and on surfaces ⁽⁵⁾. (National Health services professional handbook2010).

Modes of transmission

Modes of transmission means the process or route by which infectious microorganism travel from one person to another.



Fig 1: Infection Prevention and Control

These microorganisms are transmitted in many ways like:

- Contact: contact may be direct contact or it may be indirect contact
- Droplet transmission
- airborne transmission
- common vehicle transmission

a) Direct contact transmission:

Direct contact transmission of infectious microorganism is most common mode of transmission found. Direct contact transmission of infectious microorganism occurs when a healthy person gets in a physical contact with the infected individual.

b) Indirect contact transmission

Indirect contact transmission is transfer of infectious microorganisms via contaminated object or when a health care worker touches next patient without making hands hygiene after touching an infected patient, infectious microorganisms are also transferred by sharing patient-care items between patients without making them clean or disinfected.

c) Droplet transmission

Droplet transmission occurs when an infected microorganism travel to another person through cough, sneezing etc. These infected microorganisms can travel a distance of 2 meters.

d) Airborne transmission

Airborne transmission occurs when an infected microorganism travel in air in the form of dust particles etc. the size of these infected dust particles is less than 5 microns. These infected dust particles remain for a long time in air and can dispersed widely by air currents.

e) Common vehicle transmission:

Common vehicle transmission of infection occurs by intake of contaminated food, medicines, or by using of medical equipment without disinfecting that equipment.

Infection control measures

Infection control measures are the measures to control or reduce the transmission of infection from one person to another. Infection control

include various measures that prevent the spread of infectious disease from a health care worker to patient or vice versa.

These measures include: -

- Hand hygiene
- Infection control standard, contact, droplet, and airborne precautions.
- Procedure for decontamination of persons and disinfection of equipment and environment⁽⁶⁾.

There are two steps to improve infection control in health care settings recommended by CDC (Centre of disease control and prevention)⁽⁷⁾.

- 1) Standard precaution.
- 2) Transmission based precaution⁽⁸⁾

Standard Precaution: for all patient care:

- Should perform hand wash properly.
- Always use PPE (personal protective equipment) to prevent transmission of infection.
- Always follow respiratory hygiene precautions. Always wear mask to protect droplet transmission of infection.
- Ensure the appropriate placement and isolation of infected patient. Follow the guideline of isolation of an infected patient⁽⁹⁾.
- Handling of shape equipment. Properly clean and disinfect patient care equipment and medical instruments.

Transmission based precaution: -it is an addition to standard precautions for the infectious person to prevent the transmission of infection. Transmission based precaution is of three types:

- 1) Contact precaution.
- 2) Droplet precaution.
- 3) Airborne precaution⁽¹⁰⁾.

Contact precaution: - is used for the patients with known or suspected infection which can be transmitted from an infectious person to a healthy person.

If a person is known or suspected with infectious disease then always ensure for appropriate placement of patient, use PPE (personal protective

equipment) properly.

Limit the transport and movement of patient, use disposable items for food etc. Clean and disinfect the room properly on time.

Droplet precaution: - are precautions used for the persons who are having respiratory infection and can be transmit by coughing/ sneezing or talking.

Main precaution for droplet transmission is always put mask on an infected patient and also wear mask while dealing with an infected person.

Also ensure appropriate patient placement, limit the transport and movement of patient. Always wear PPE (personal protective equipment) properly.

Airborne precautions: - it is used for the patients who are suspected to be infected with pathogens transmitted by the airborne route e.g. (tuberculosis, measles etc).

Main precaution for the transmission of airborne infection is always wear mask.

Minimize the transport and movement of infectious patient, use appropriately PPE (personal protective equipment).

Immunize susceptible persons as soon as possible following unprotected contact with vaccine preventable infections (e.g., measles and varicella etc) ⁽¹¹⁾.

Operational Definitions

Knowledge: Evaluation of infection control among working staff in Radiology Department.

Infection: Refers to “start of growing harmful germs in our body”

Awareness: This is something which creates knowledge about infection control. **Infection**

Control: Refers to stop the spread of disease.

Material and Method

Research Approach: Observational approach

Research Design: Pre-experimental

design **Sampling Technique:** Convenience

sampling technique **Statistical Method:**

Descriptive Statistical Method

Research Setting: Selected Different Hospitals of North Kashmir

Sample Size: 100

Sampling Criteria

Inclusion Criteria

Staff working in Radiology Department, trainee/intern of Radiology Department.

Exclusion Criteria

Those who are not willing to participate and those who are not present at the time of study.

Research Setting of The Study

The study was conducted in radiology department in different hospitals of North Kashmir.

Research Duration

Duration of study was two months i.e., from July 2021 to August 2021.

Methodology

The study was questionnaire based and the detailed information about the study was explained to the staff and students working in radiology department.

Informed consent was taken from all of them and their demographic profile was noted in the study proforma.

Ethical consideration

Institutional ethics committee

This protocol design, tools for data collection, questionnaire and consent forms were reviewed by the Institutional Ethics Committee at JAMIA HAMDARD, NEW DELHI as a part of the procedure involved for all researches that require human intervention. The study was conducted after the approval of the IEC.

Informed consent forms

Appropriate consent forms were designed for seeking written consent which were approved by the IEC at JAMIA HAMDARD, NEW DELHI. The participants were explained the procedure, and requirements of the study in detail with special reference to technical aspects such as certain scientific/medical terms used. Only after clarity of procedure was attained to the satisfaction of the participant, they were requested to sign the consent form for the study.

Study Procedure

Acceptance for the study was obtained from the ethical committee, Jamia Hamdard University (Deemed to be University). A self-structured questionnaire was prepared and validated by the subject experts. Corrections suggested by experts were made prior to distribution of questionnaire. Sample size was calculated using formula with estimation of mean with 5% level of significance. Data was collected from radiology department by offline means from different hospitals of north Kashmir using convenience sampling technique. Responses by staff employed in Radiology Department was recorded and analysed by descriptive statistics.

Data Analysis: Data was obtained by using descriptive statistics. The data obtained was tabulated in Microsoft Excel Spreadsheet and the analysis was done using Descriptive Statistical Method, using SPSS version 20. The present study was undertaken to assess knowledge of infection

control and aware about infection control methods in Radiology Department. The data for the study were collected through offline medium and were analysed and is presented in two sections.

- 1) The first part includes socio-demographic information of the sample.
- 2) The second part includes knowledge and awareness-based questions.

Results

This prospective and questionnaire-based study was carried out in the Department of Radiology in different hospitals of North Kashmir from July 2021 to August 2021. The aim of the study was to assess the knowledge and awareness among working staff of Radiology Department about infection control.

The response obtained from the sample was tabulated in Microsoft Excel spreadsheet and was analysed by using Descriptive Statistical method.

Sheet 1

Table 1: Socio-Demographic Data

DEMOGRAPHIC DATA	VARIABLE	(N1=64)	
		NUMBER (N)	PERCENTAGE
GENDER	MALE	55	86%
	FEMALE	09	14%
AGE	20-30 YEARS	35	55%
	31-40 YEARS	17	26%
	41-50 YEARS	12	19%
EDUCATIONAL QUALIFICATION	Upto10+2	19	30%
	GRADUATE	34	53%
	POST GRADUATE	11	17%
NO. OF WORKING YEARS	>1 YEAR	31	48%
	2-5 YEARS	7	11%
	6-10 YEARS	7	11%
	>10 YEARS	19	30%
DESIGNATION	Intern/Trainee	25	39%
	Technologist	35	55%
	Radiologist	04	6%
MARITAL STATUS	Married	32	50%
	Unmarried	32	50%

Table 1 contains socio-demographic data of samples comprising Radiologists, Radiographers, interns/trainee. The majority population were male (86%) and female were (14%). 55% of the population in sample were in age group between 20-30 years, 26% were between 31-40 years and 9% were 41-50 years and above. Majority (53%) qualification of samples were graduation, 30%

were up to 10+2 and 17% were post-graduate.

Working experience of samples were 1 year with majority 48%, 11% with the experience of 2-5 years, and 11% with the experience of 6-10 years. 30% with the experience of more than 10 years.

The marital status of the sample of study was 50% married and 50% unmarried.

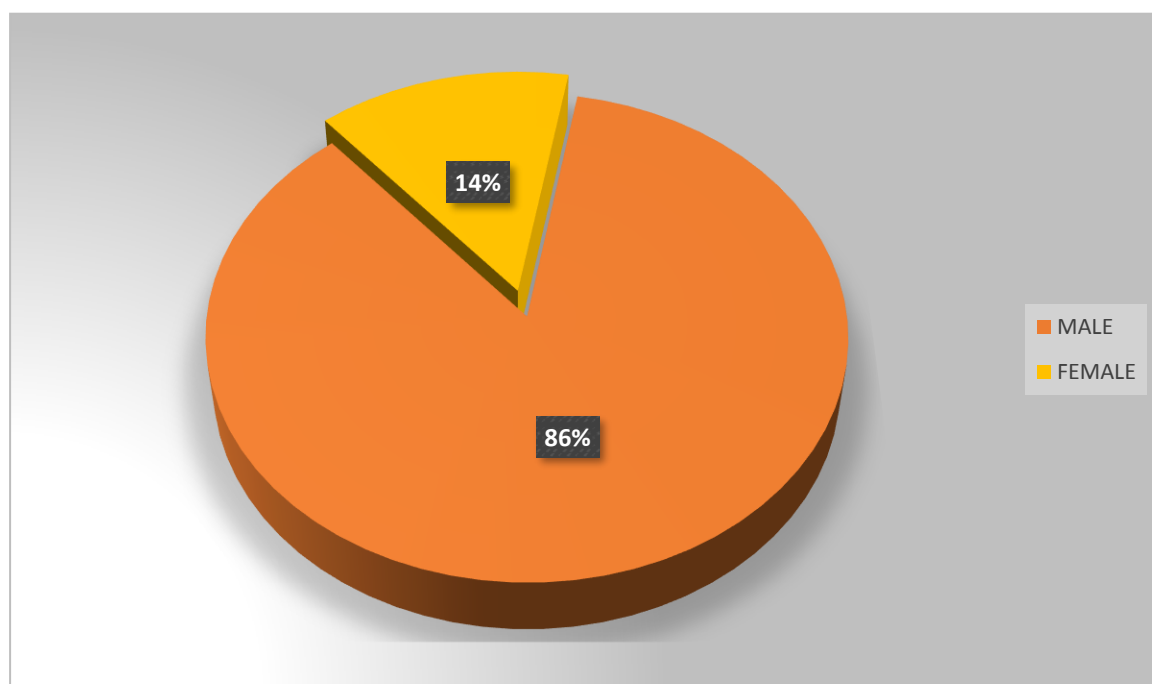


Fig 2: Gender wise distribution of intern/trainee, technologist, radiologist

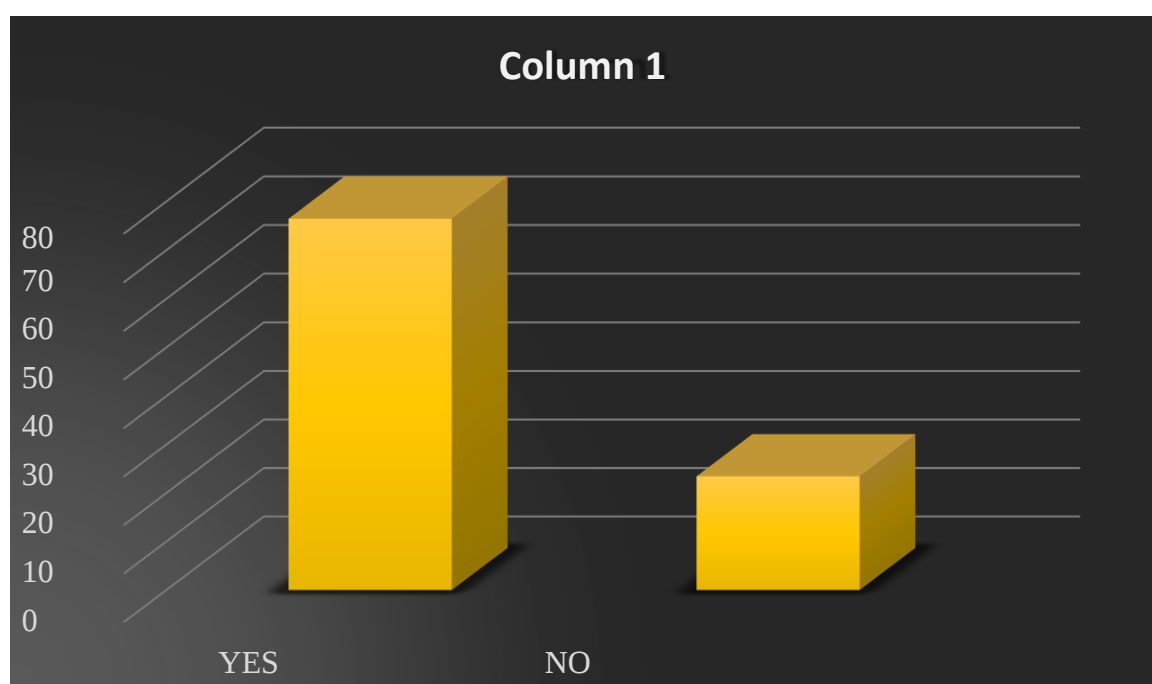


Fig 3: Graph showing whether they received training on infection control

The graph shows the infection control training received by working staff of Radiology Department. Majority of population 70% of the staff have received training of infection control.

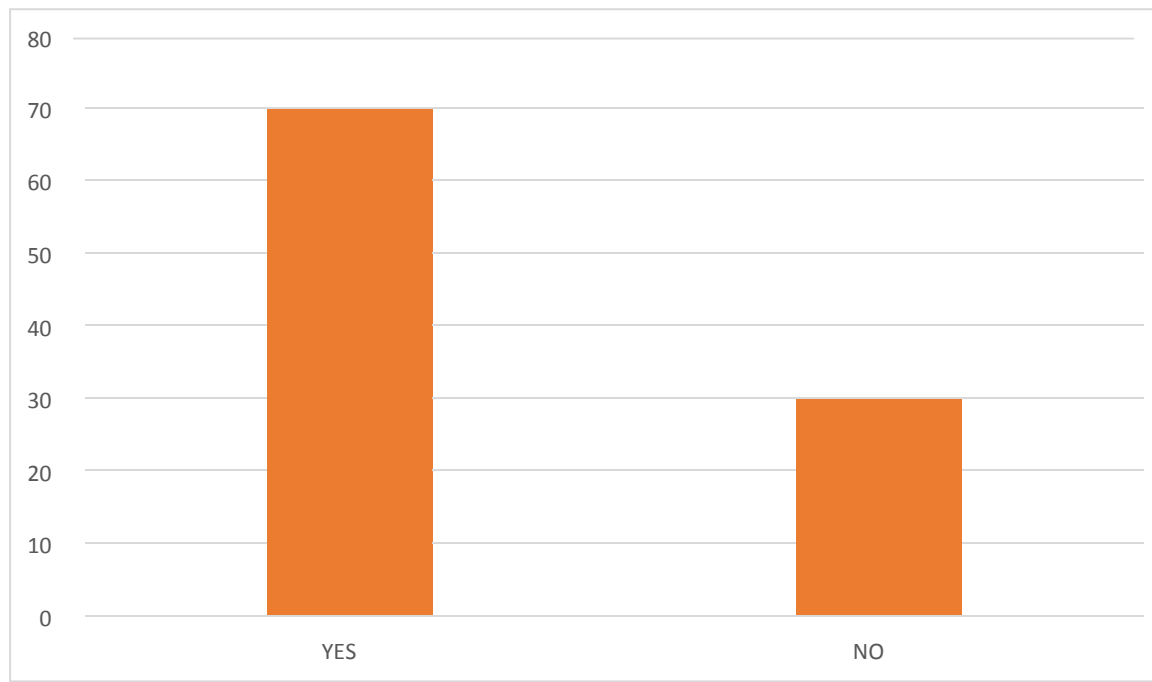


Fig 4: Graph showing if they had any regulatory board to check infection control

The graph shows the percentage of hospitals having regulatory board to check for infection control. Majority i.e.; 70% of hospitals have regulatory board to check the infection control.

Only 30% of hospitals were not having regulatory board to check for infection control.

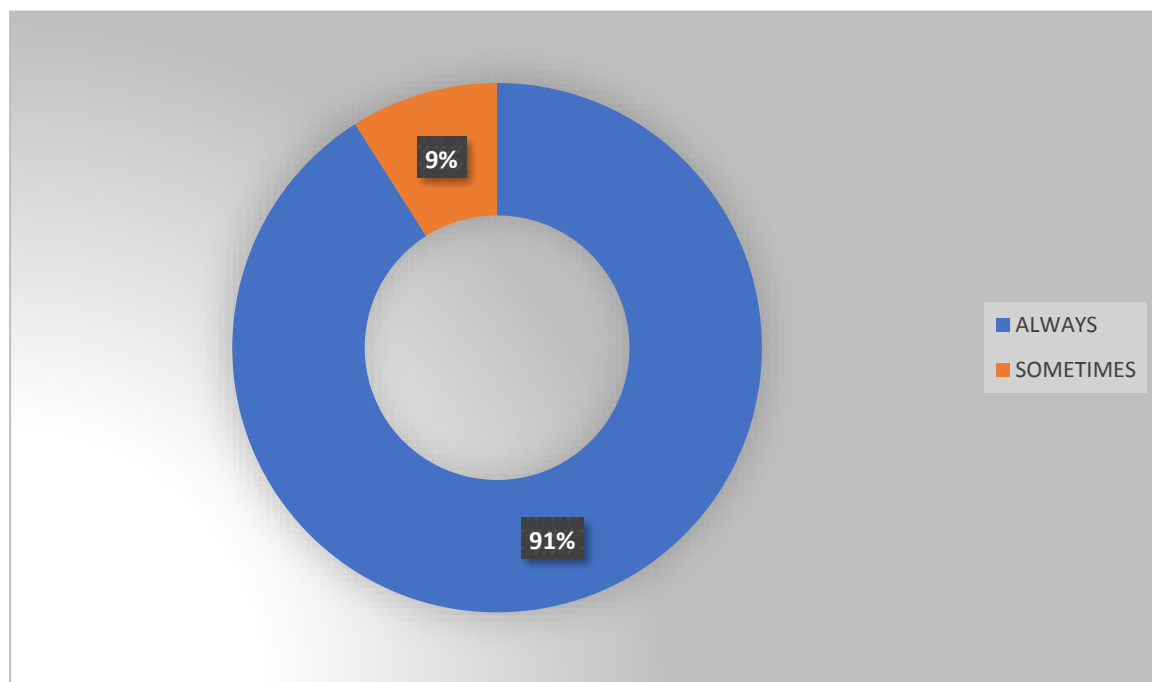


Fig 5: Results showing how often they wash hands after coming in contact with patient

Graph shows how often working staff of Radiology Department wash their hands after coming in contact with patient were 91% wash their hands regularly. 9% of the staff sometimes wash their hands after coming in contact with patient.

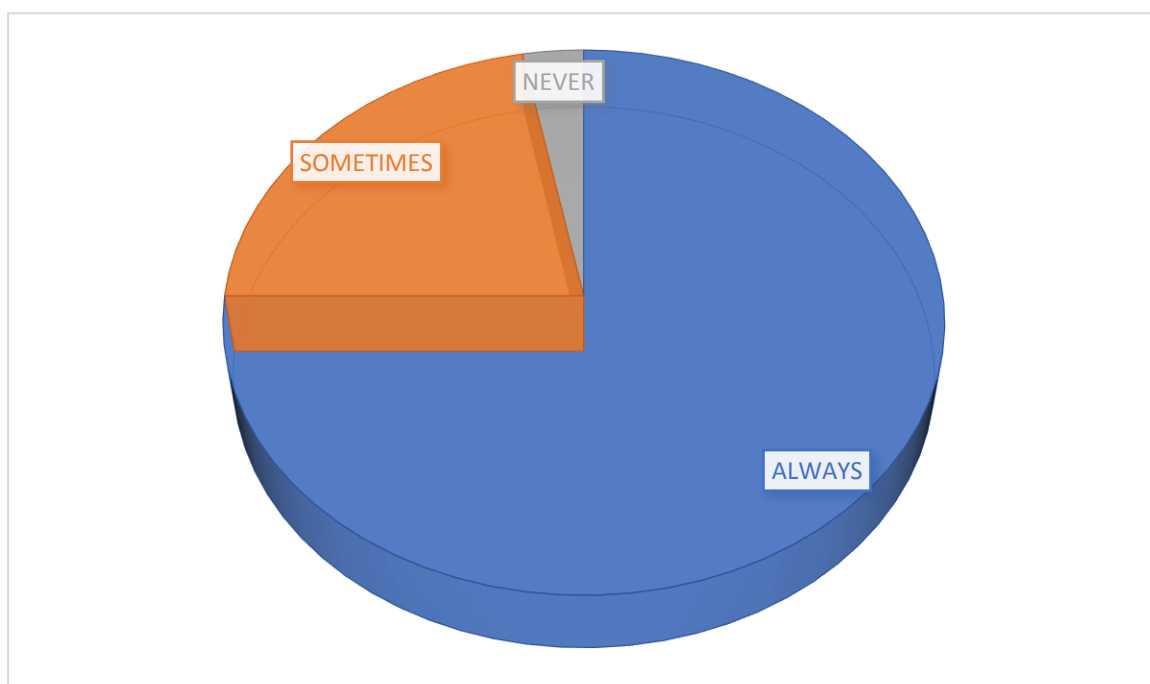


Fig 6: To show if they fumigate the room after the infected patient leaves

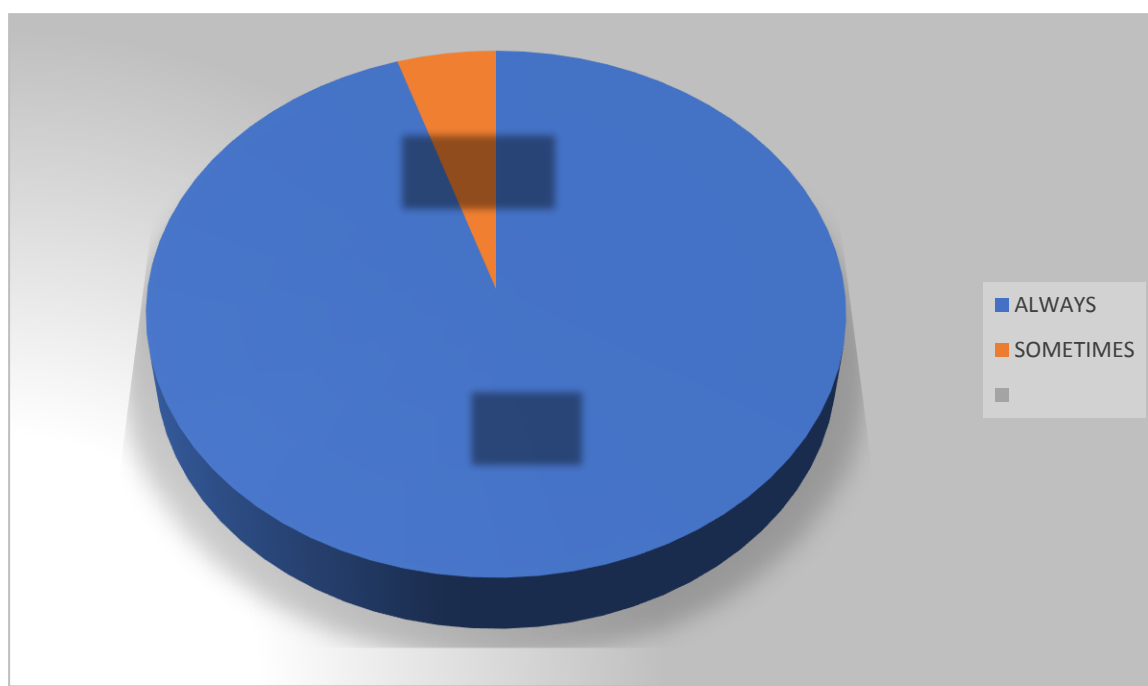


Fig 7: To show if they follow proper hand wash rules

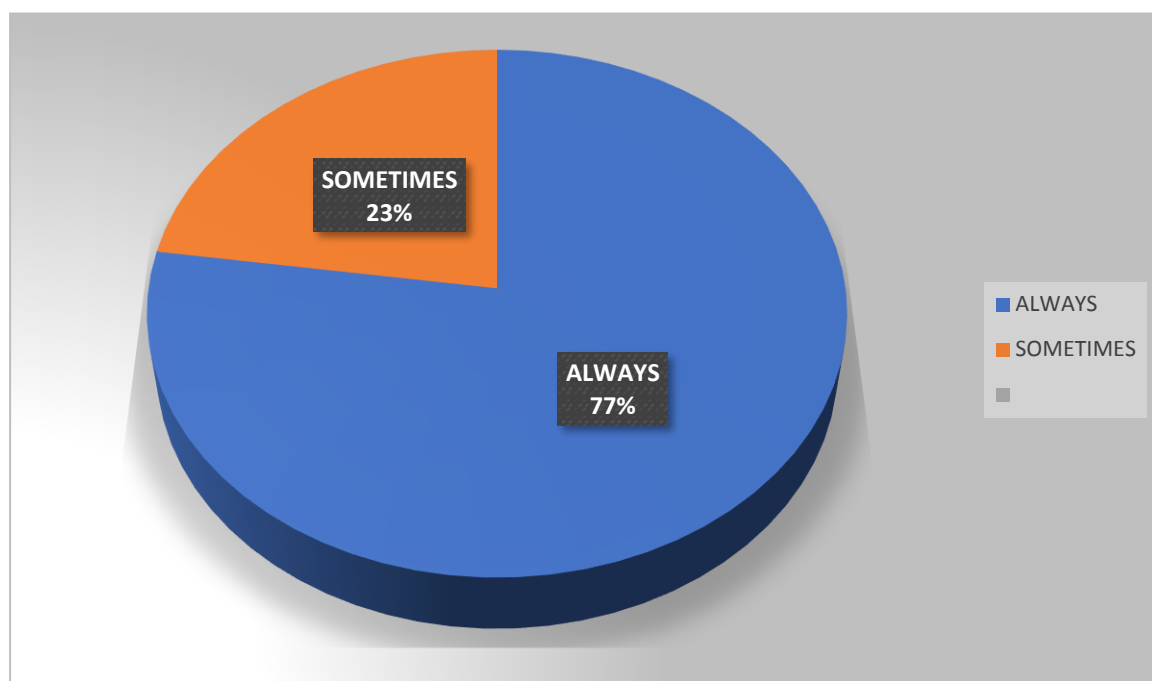


Fig 8: To show on touching any instrument if they feel like sanitizing/ washing hands

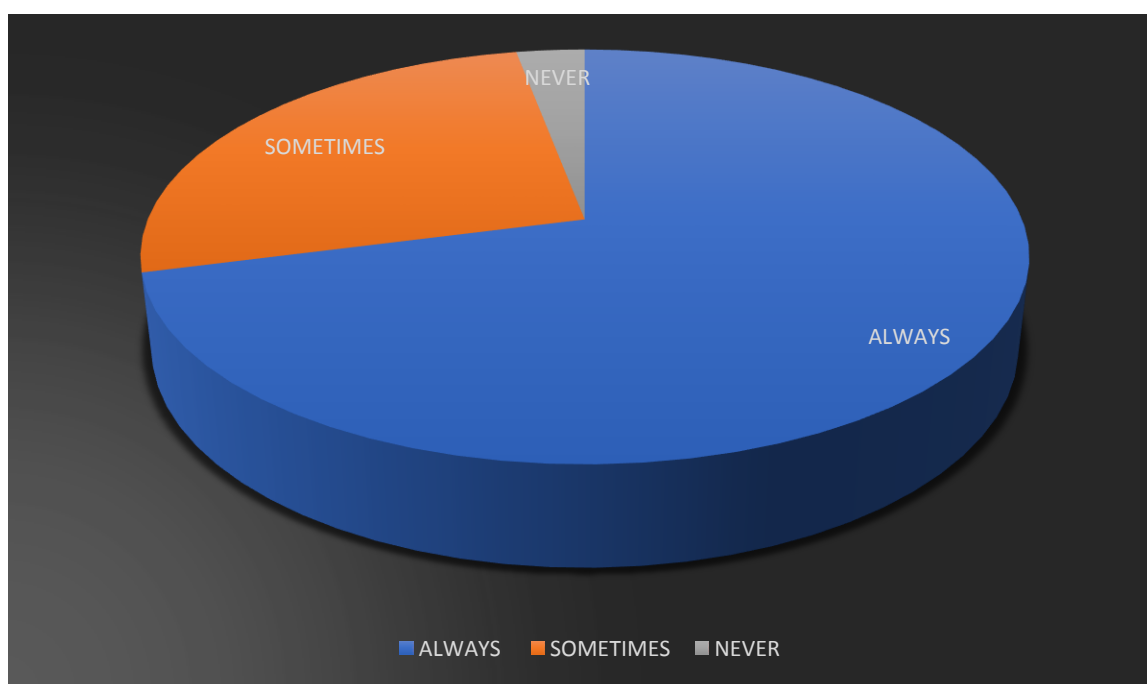


Fig 9: To show if they sterilize the equipment before using them on patient

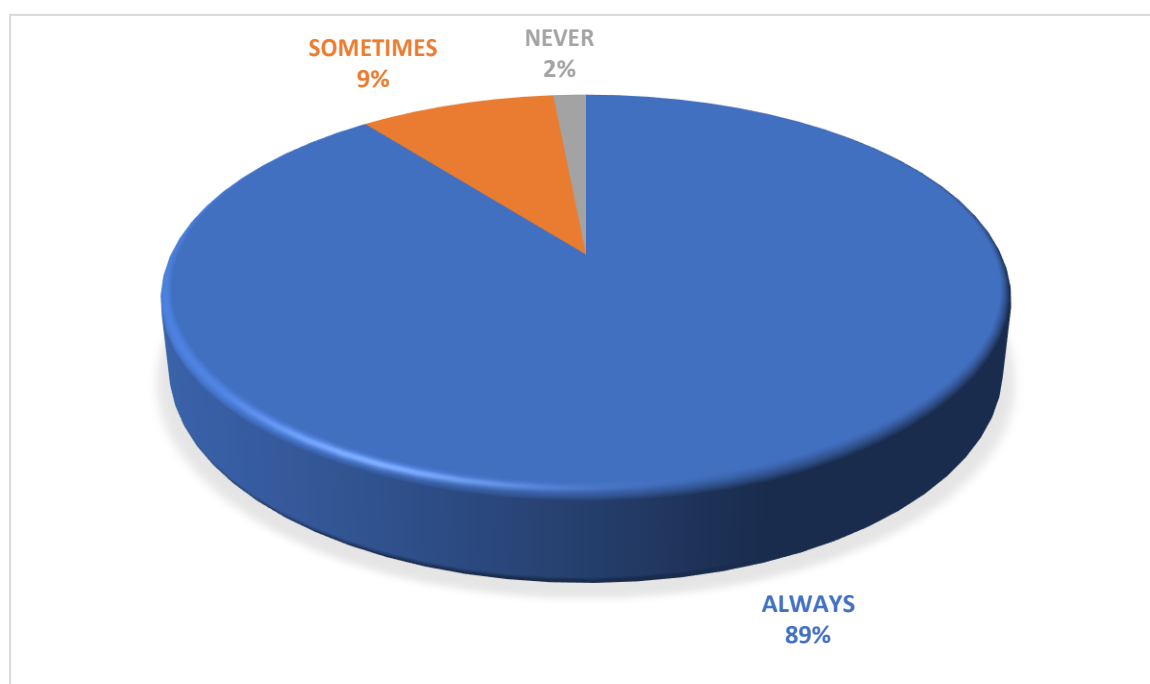


Fig 10: To show if they wear a lead apron to protect from harmful radiation

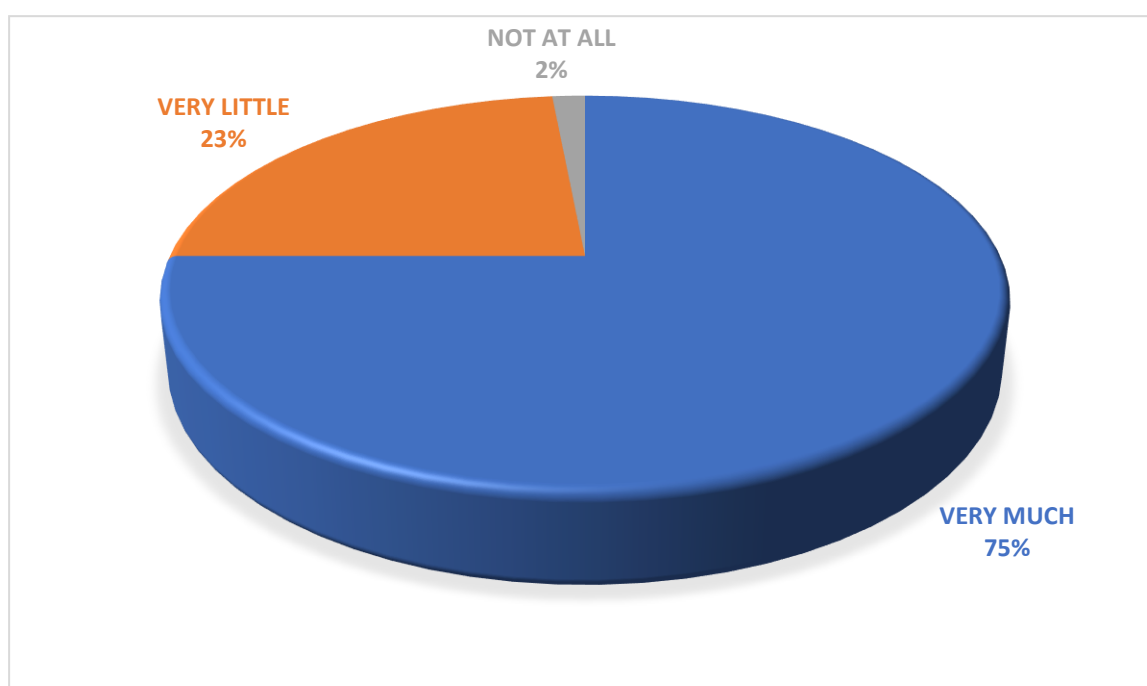


Fig 11: To show if they know how to handle the patient if he/she got allergy contrast

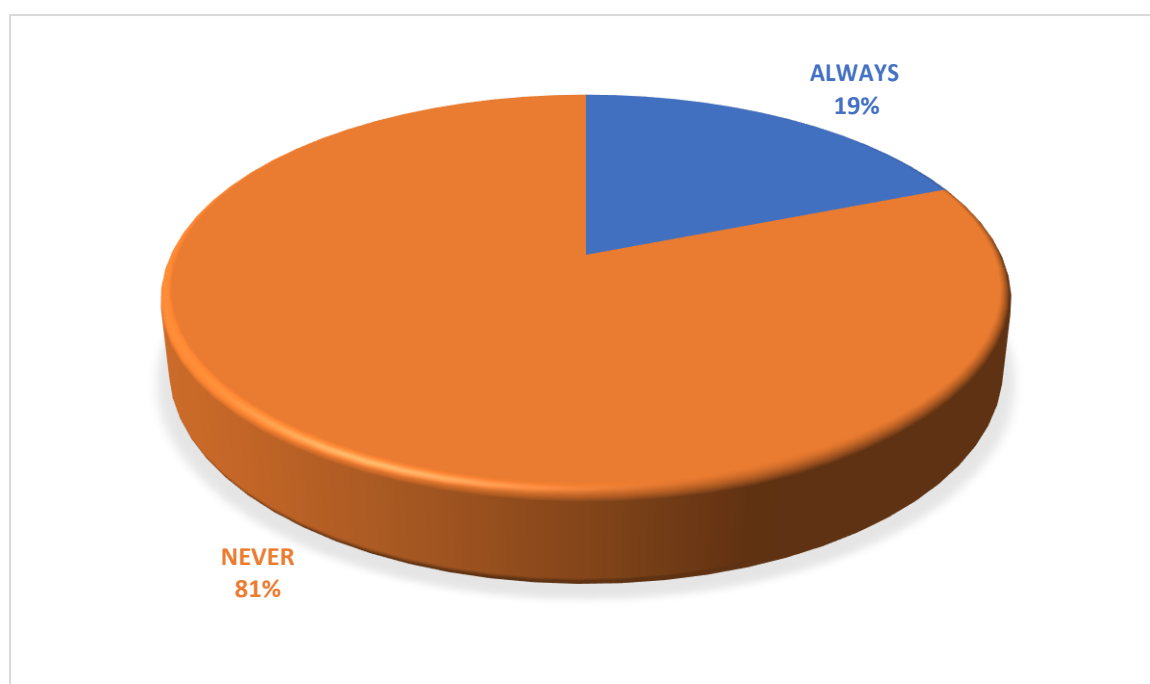


Fig 12: To show if they cover gonads in case gonads exposed to radiation

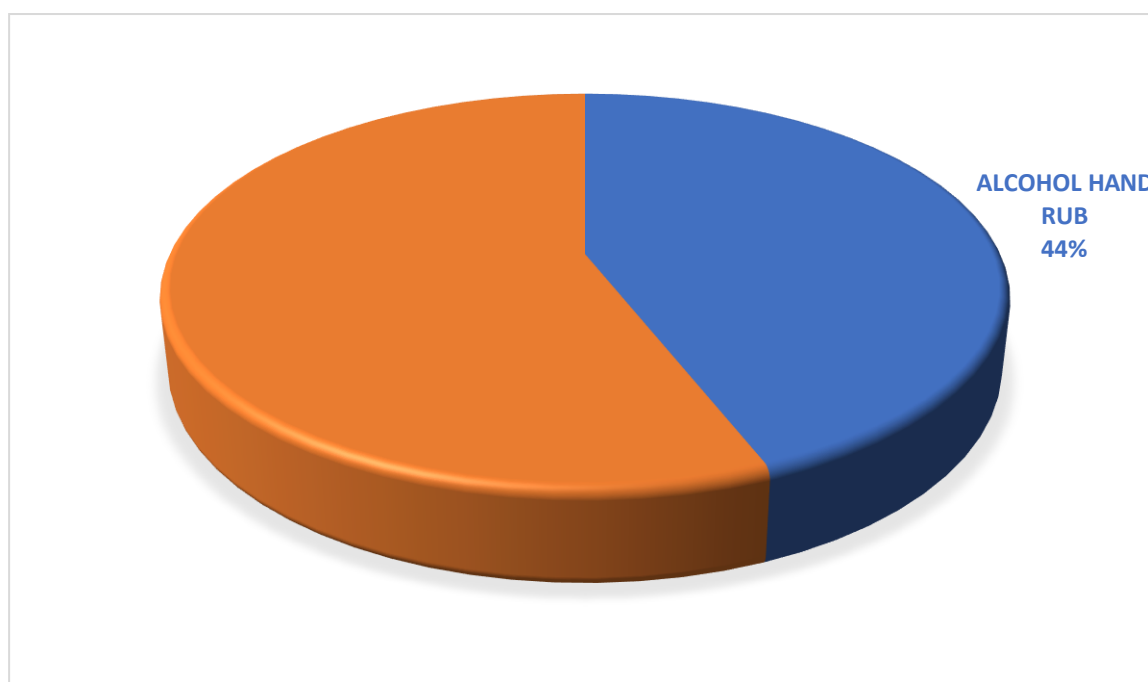


Fig 13: To show preferred hand washing method to prevent transmission of Clostridium difficile-associated infection

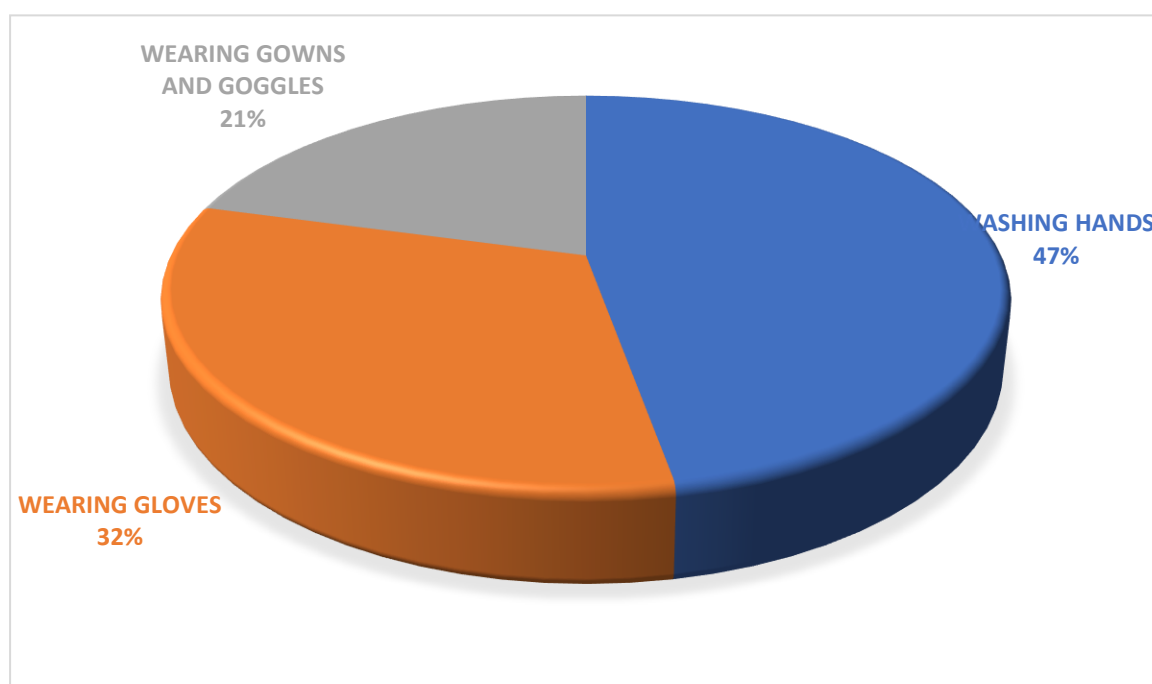


Fig 14: To show first priority in preventing infections while providing care to patient

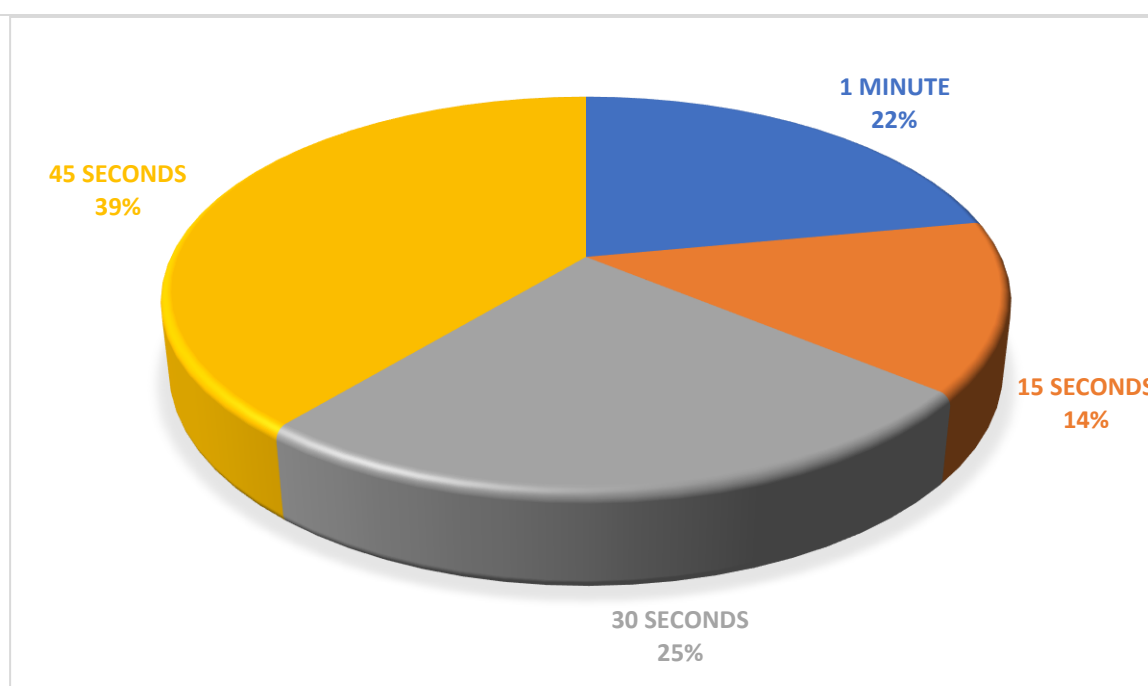


Fig 15: To show time needed to wash hands for effective hand wash

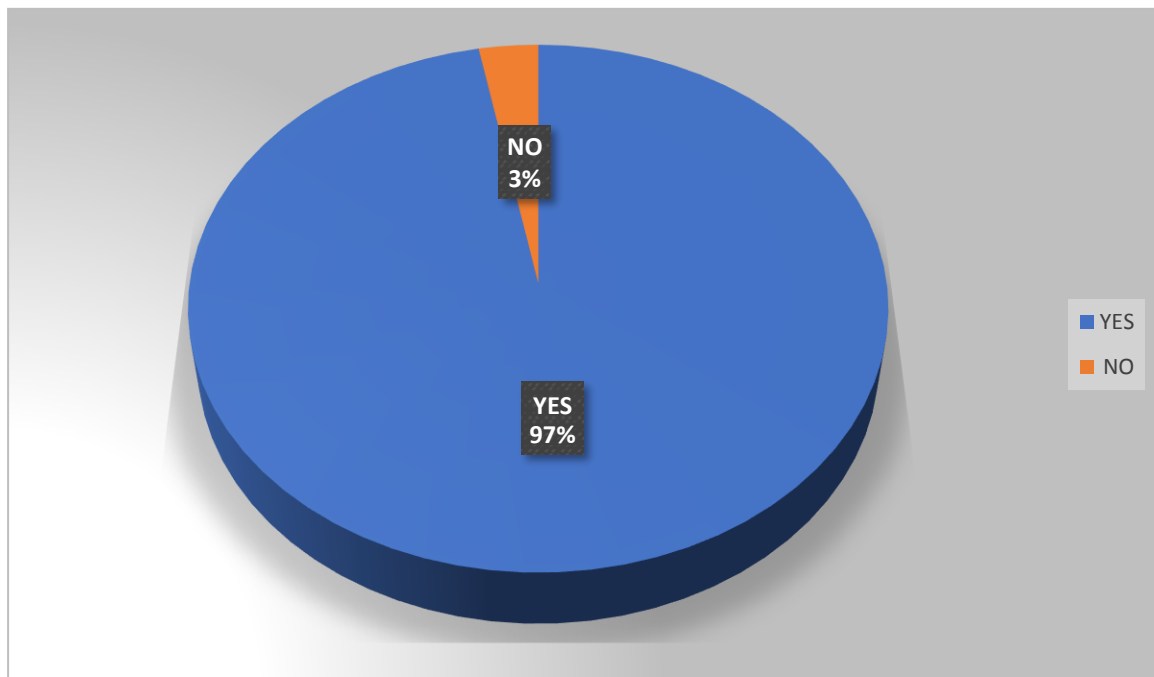


Fig 16: To show if it is important to wear mask while attending a patient with respiratory infections

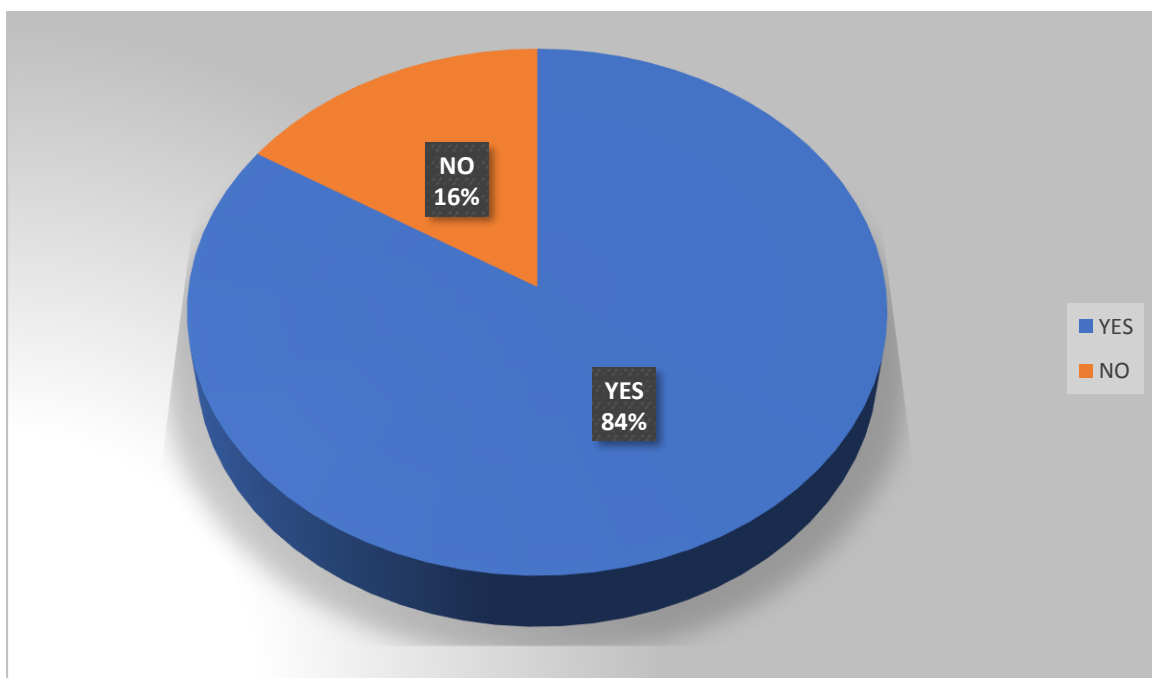


Fig 17: To show if they think the hospital is prepared for any infection outbreak

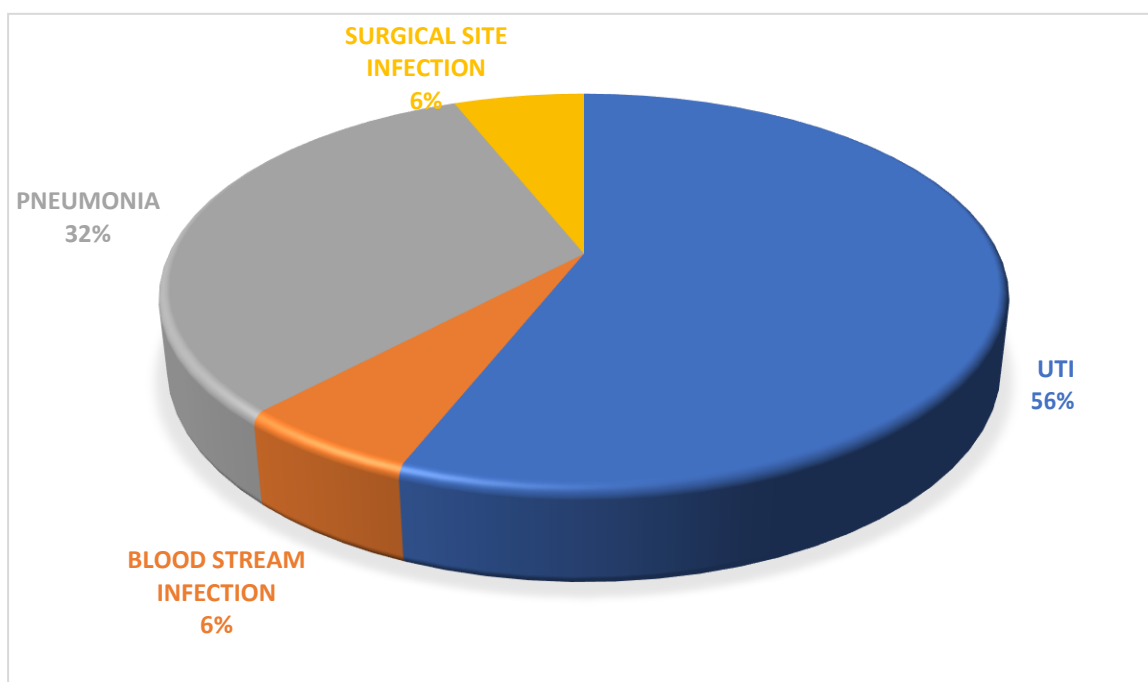


Fig 18: To show plank pain and fever is the indication of which nosocomial infection

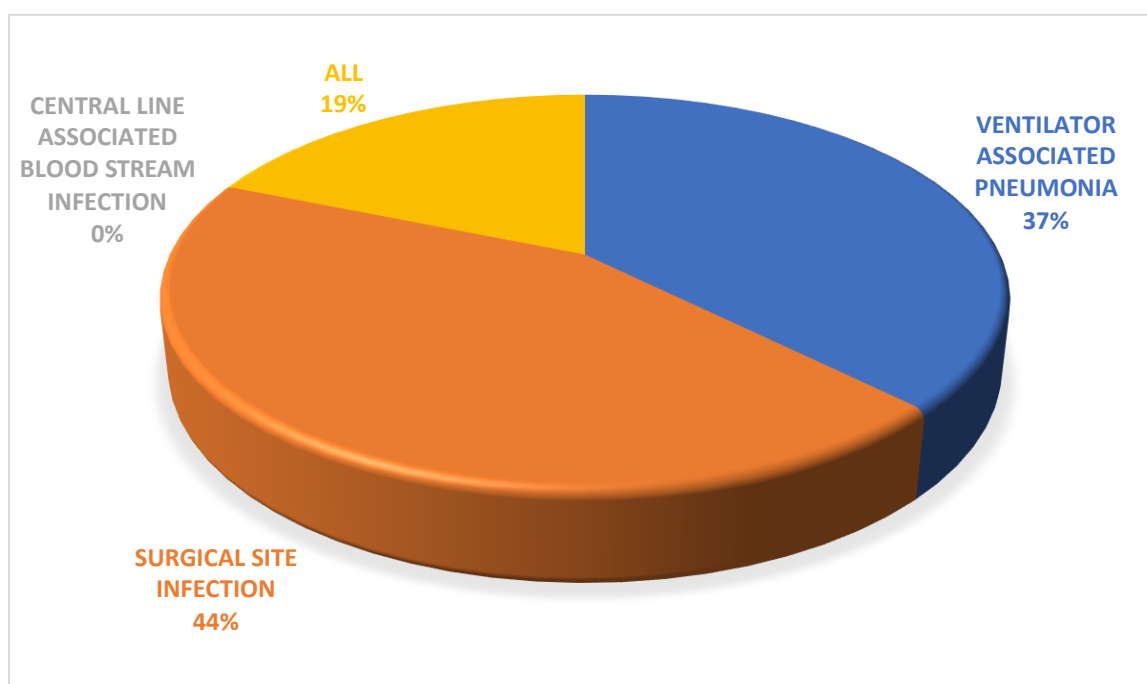


Fig 19: To show types of hospital acquired infection

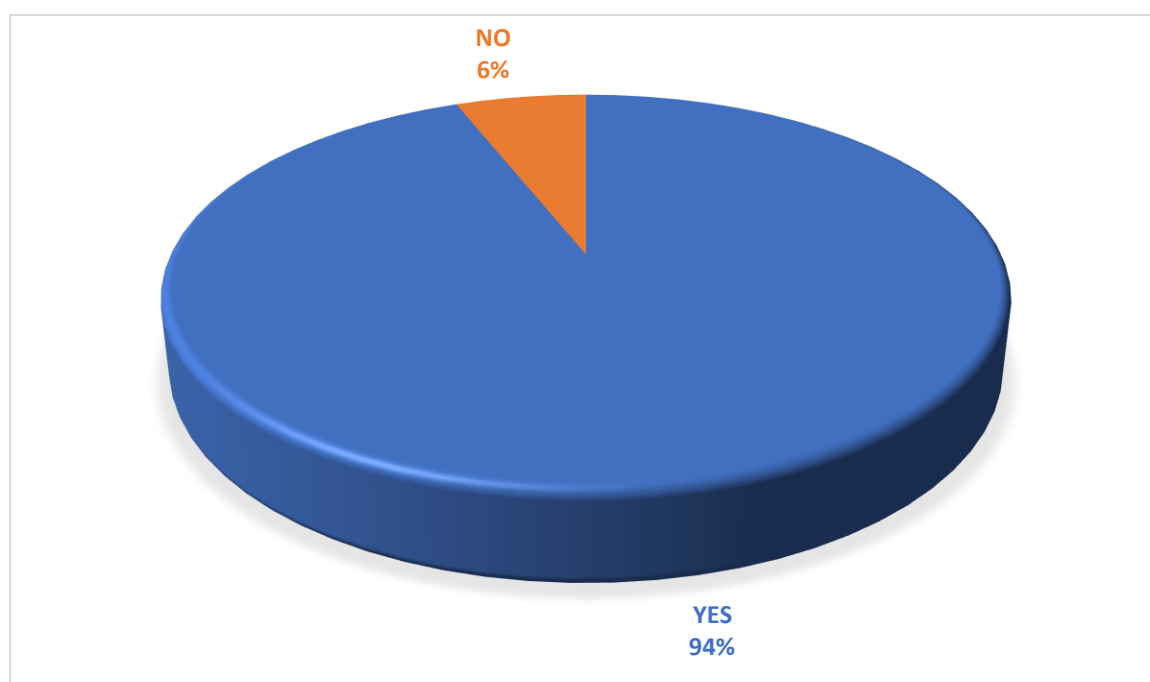


Fig 20: To show whether our hands and forearms should be lower than elbow when performing hand hygiene routine

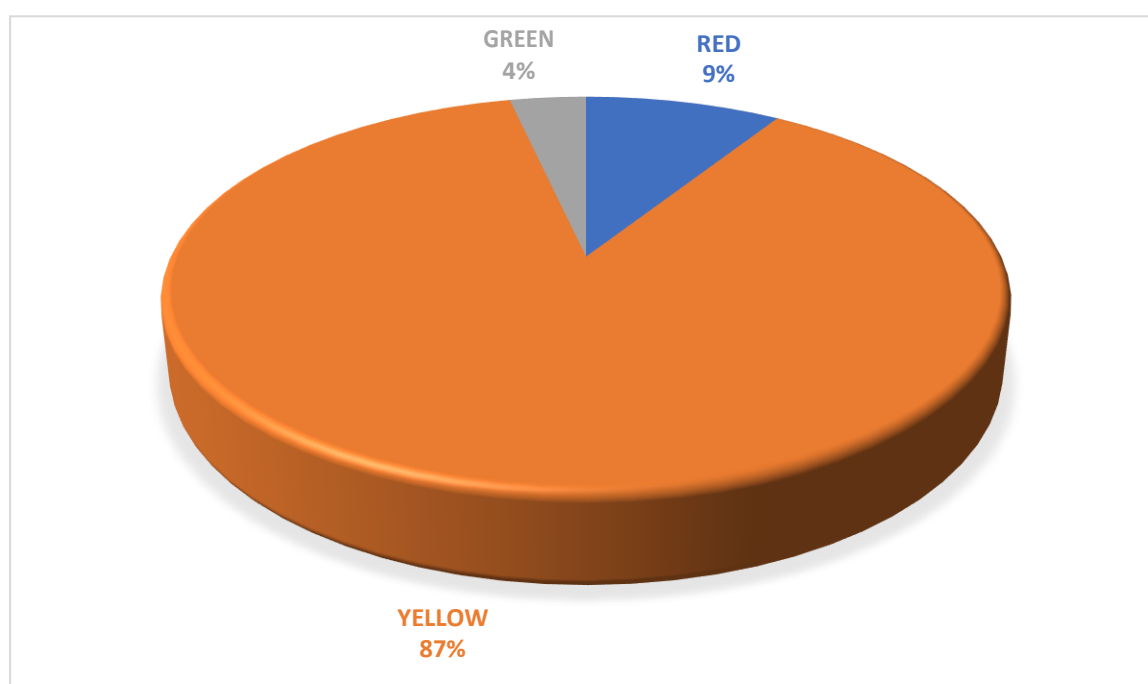


Fig 21: To show colour bag should you use when disposing of clinical waste

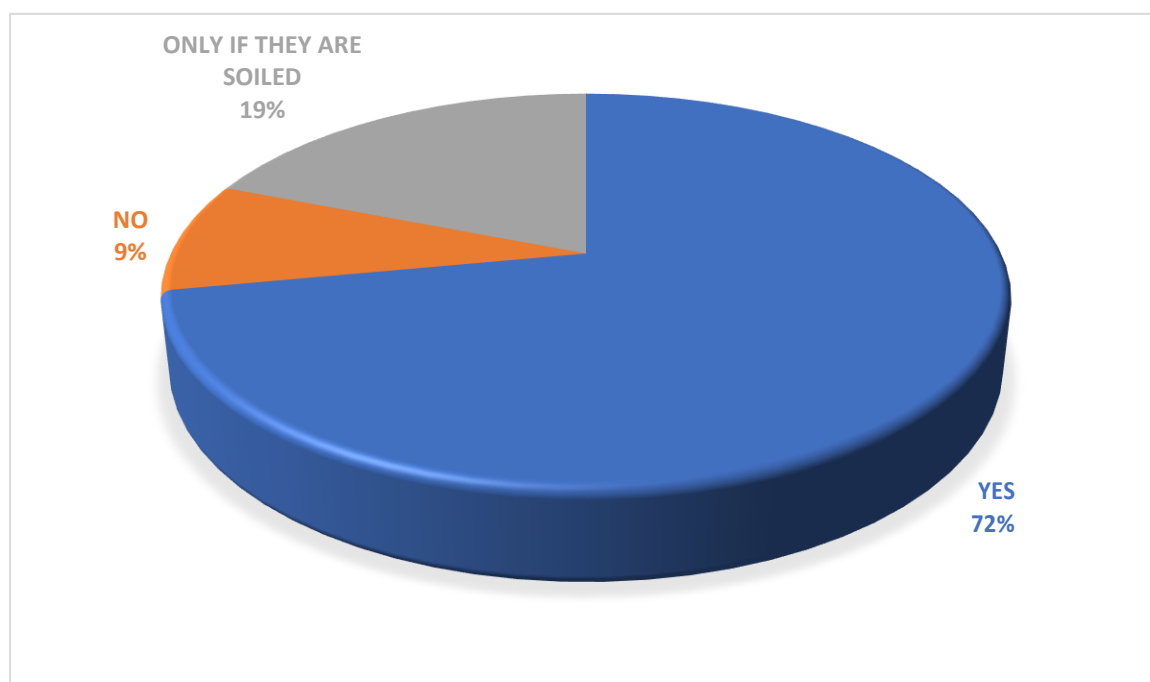


Fig 22: To show whether they need to wash hands after wearing gloves

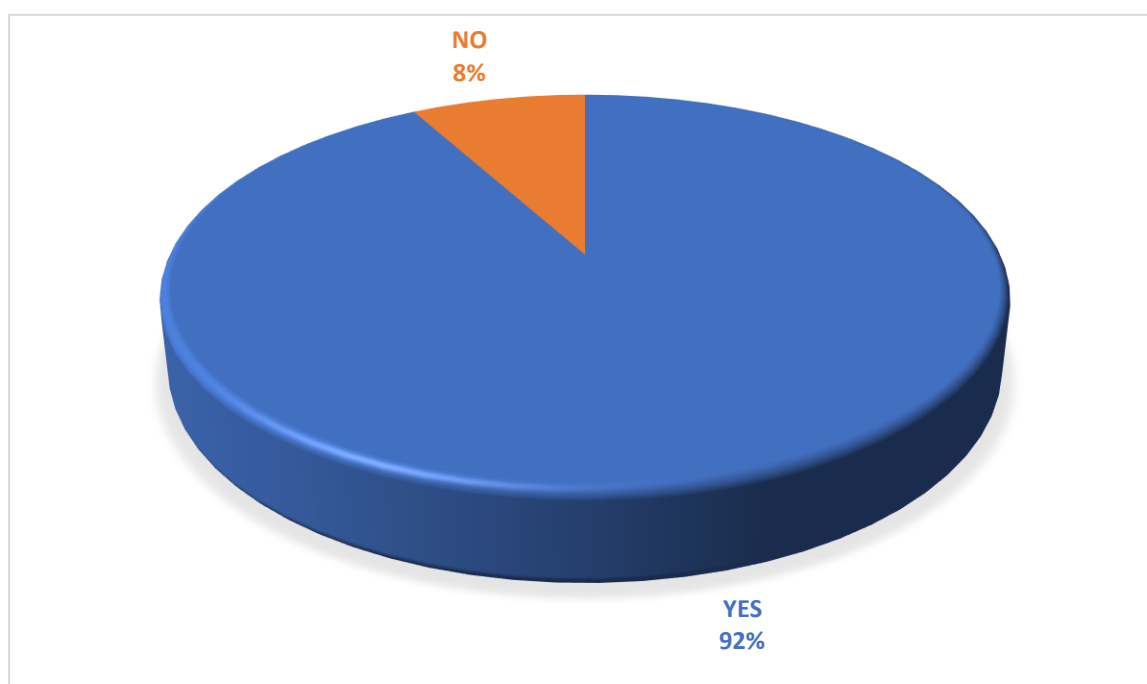


Fig 23: To show whether they follow CDC (centres for disease control and prevention) guidelines for infection control in your department

Sheet 2

Table 3: Socio-Demographic data of house-keeping staff

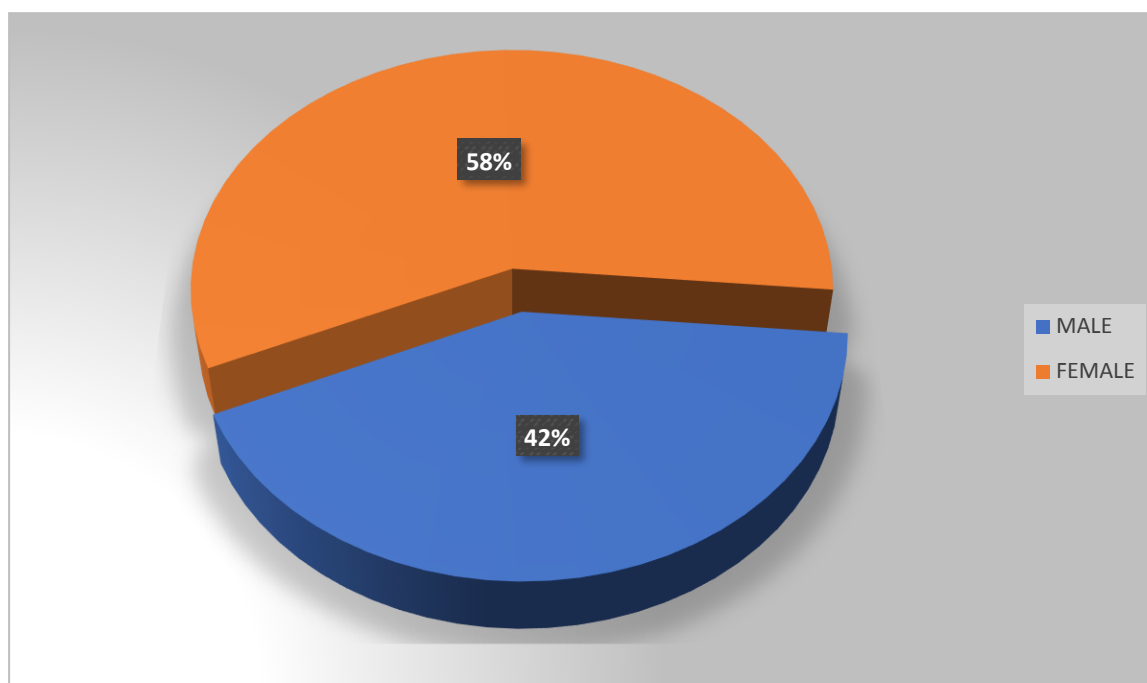
DEMOGRAPHIC DATA	VARIABLE	(N2=36)	
		NUMBER (N)	PERCENTAGE
GENDER	MALE	15	42%
	FEMALE	21	58%
AGE	20-30 YEARS	5	14%
	31-40 YEARS	15	42%
	41-50 YEARS	16	44%
EDUCATIONAL QUALIFICATION	Upto10+2	36	100%
NO. OF WORKING YEARS	>1 YEAR	2	5.5%
	2-5 YEARS	8	22%
	6-10 YEARS	20	55.5%
	>10 YEARS	7	17%
MARITAL STATUS	Married	27	75%
	Unmarried	09	25%

Table 2 contains socio-demographic data of samples comprising housekeeping staff and attendant in radiology department. The majority population were female (58%) and male were (42%). 14% of the population in the study were in age group between 20-30 years, 42% were between 31-40 years and 44% were 41-50 years and above. Education qualification of all staff was

up to 10th

Working experience of samples were 6-10 years with majority (55.5%), 22% having work experience of 2-5 years, 17% with the experience of more than 10 years and only 5.5% having above 1 year of experience.

The marital status of the sample of study was 75% married and 25% unmarried.

**Fig 24:** Gender wise distribution of house-keeping staffs

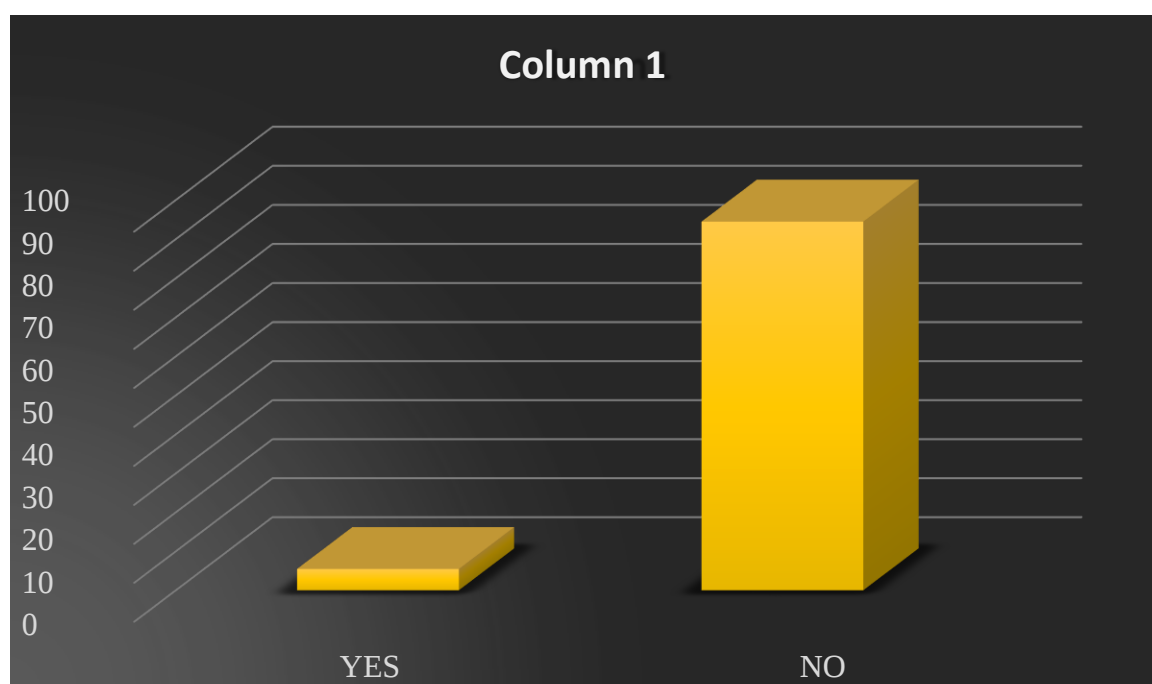


Fig 25: Graph showing whether they received training on infection control

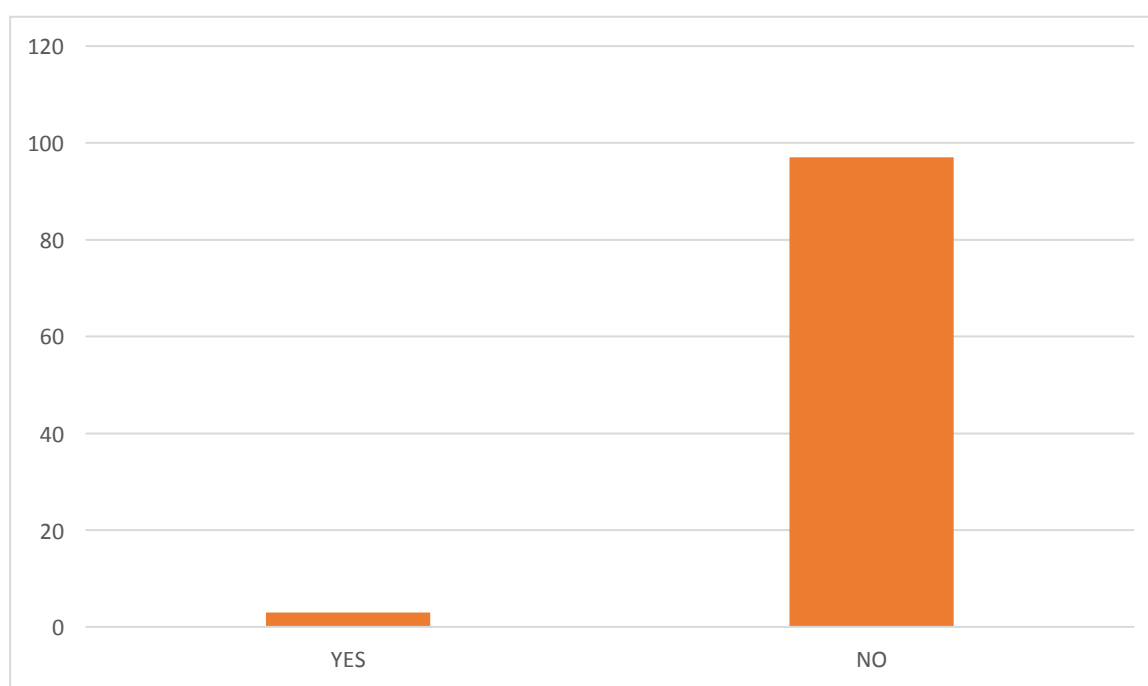


Fig 26: Graph showing if they had any regulatory board to check infection control

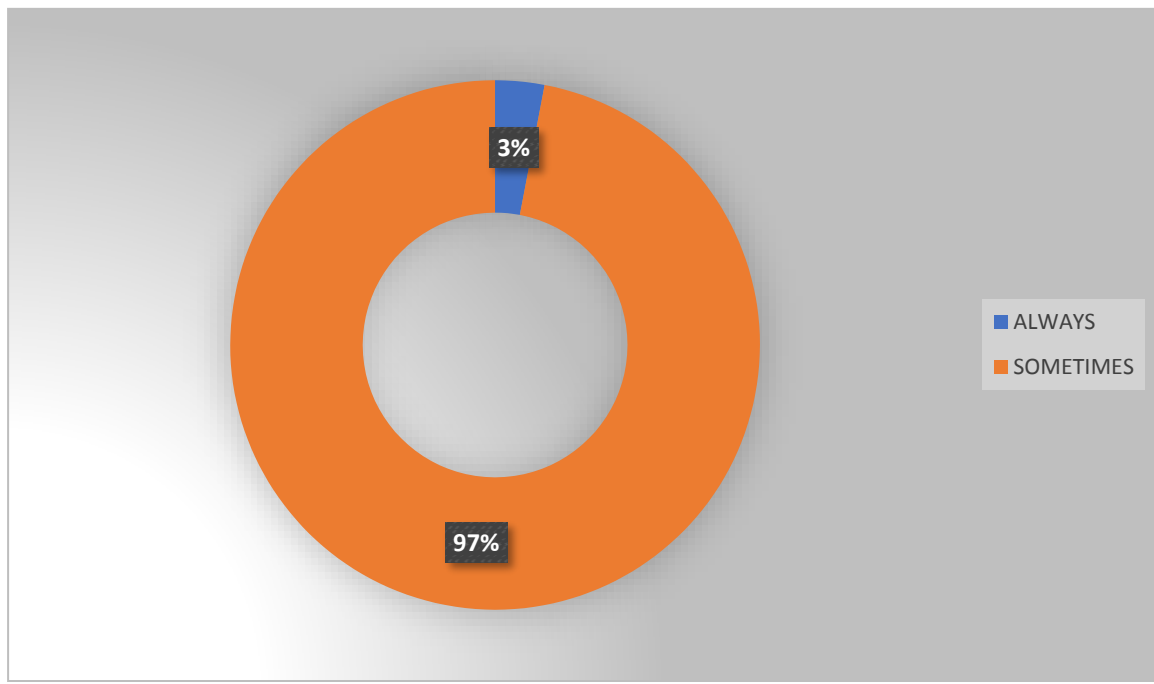


Fig 27: Results showing how often they wash hands after coming in contact with patient

The response by the housekeeping staff and attendant was calculated in Microsoft Excel.

Response to the knowledge-based questions by the housekeeping staff and attendant was poor as compared to the radiologist, technologist and

intern/trainee.

Response to each question was recorded and was converted into percentage with the help of Microsoft excel.

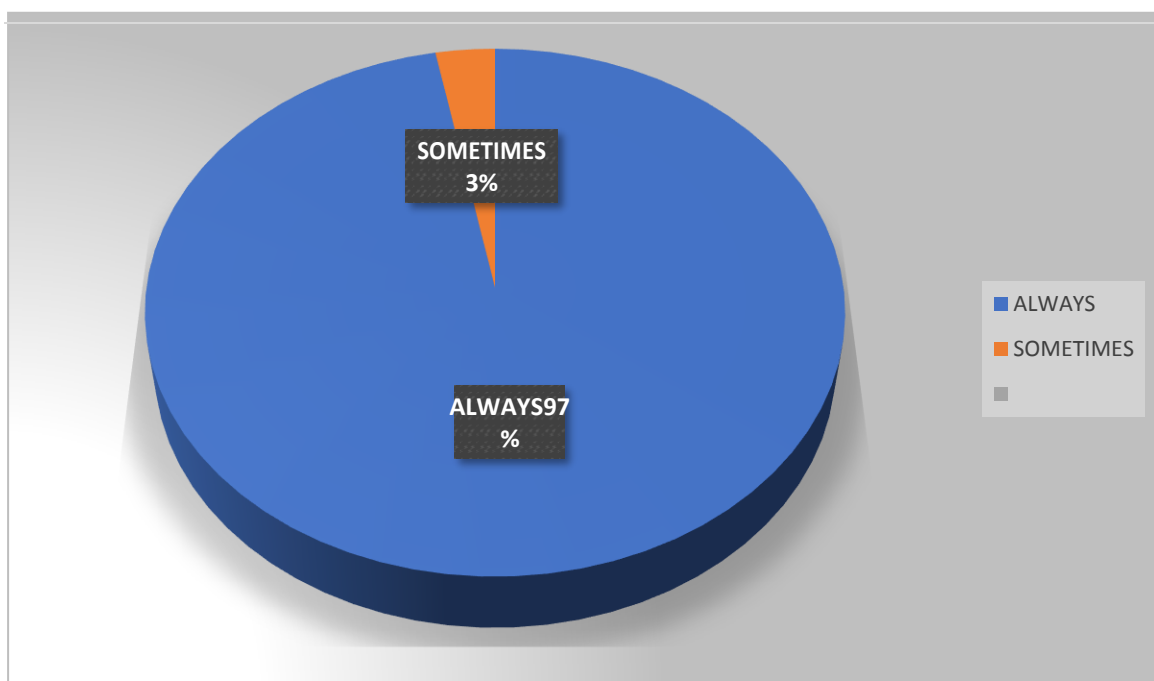


Fig 28: To show if they follow proper hand wash rules

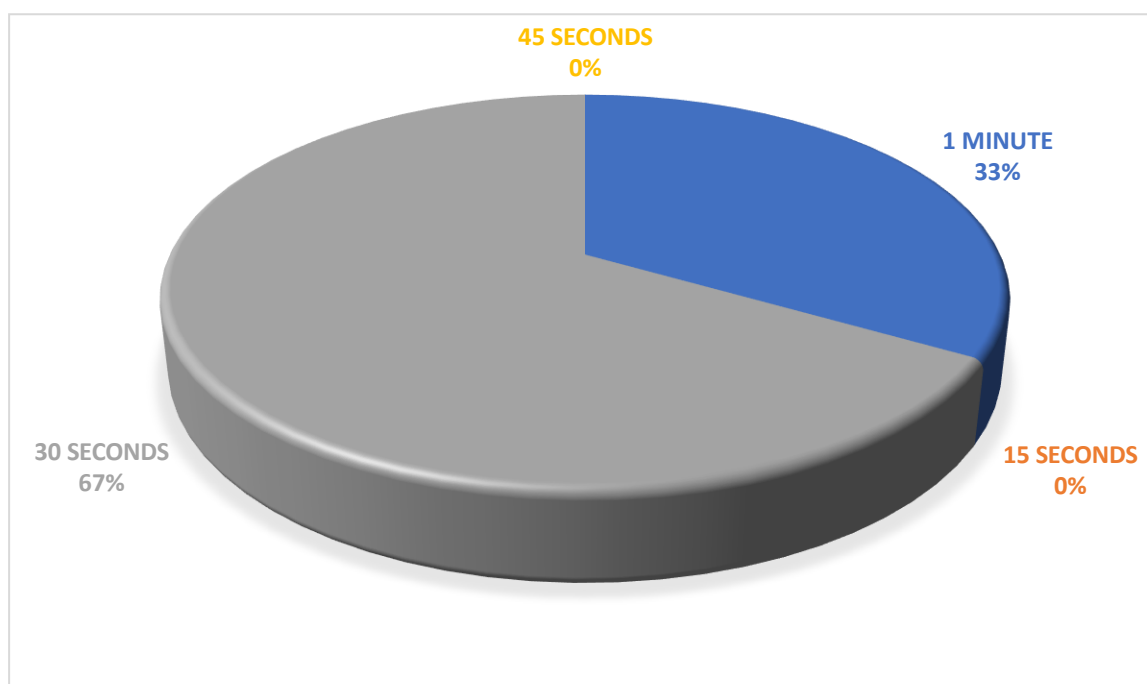


Fig 30: To show time needed to wash hands for effective hand wash

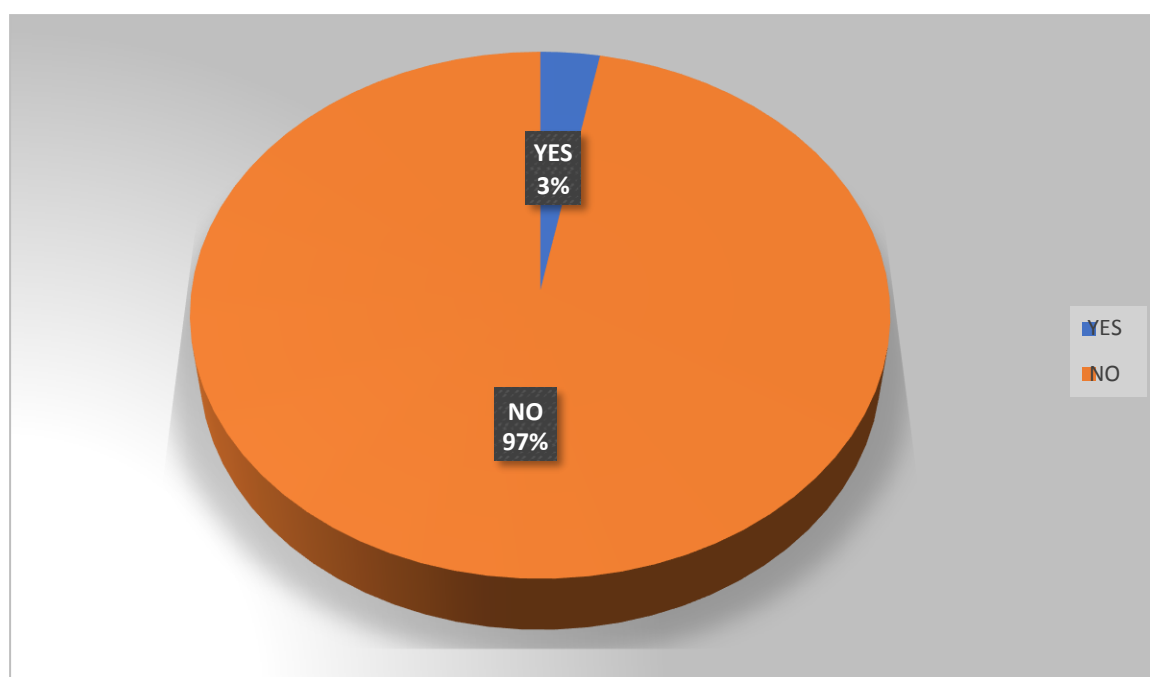


Fig 31: To show if they think the hospital is prepared for any infection outbreak

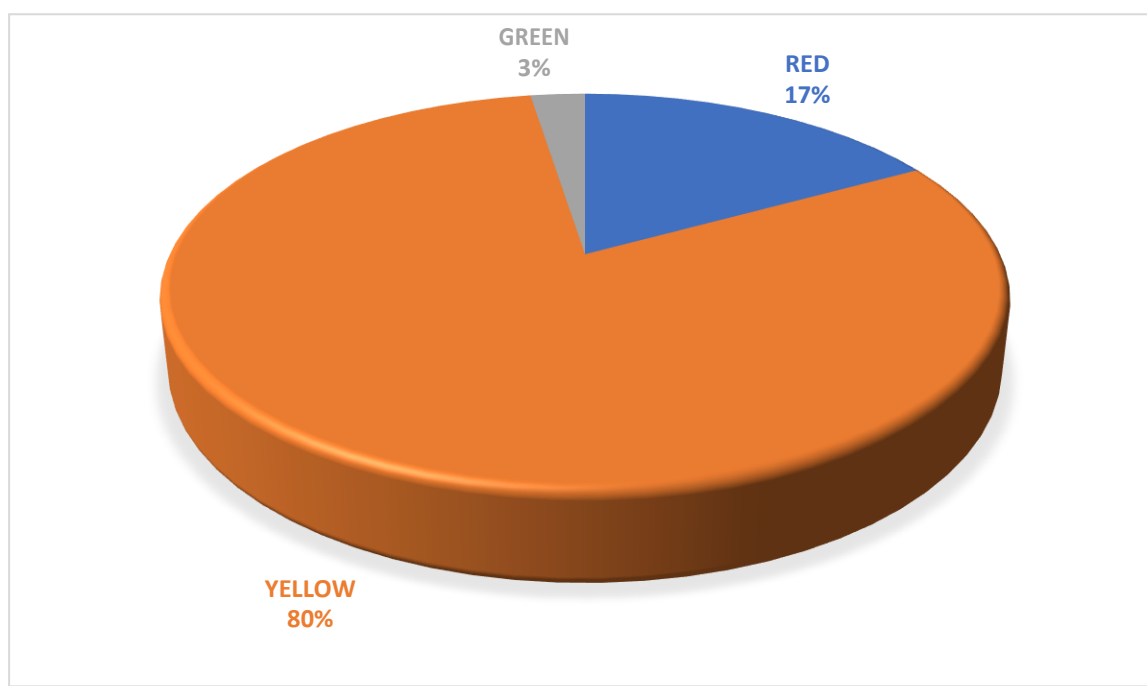


Fig 33: To show colour bag should you use when disposing of clinical waste

Discussions

When hazardous microorganisms enter our bodies and begin to multiply, we call it an infection. As a result, infection develops. The majority of infectious diseases are transmissible, meaning they may spread from one person to another. The study's goal was to analyse working employees in radiology departments at several hospitals in north Kashmir for their knowledge and awareness. Infection management is something that everyone is familiar with, but it takes a lot of knowledge and effort to keep infections at bay. The research was carried out in various hospitals in north Kashmir. It was a questionnaire-based study with two sets of questionnaires, one for knowledge and the other for awareness.

The findings of the survey revealed that housekeeping and radiology department attendant employees in several hospitals in north Kashmir are lacking in knowledge. As a result, there is potential to further investigate infection control knowledge and awareness in the radiology department in north Kashmir. Infection is a serious issue in the delivery of health care services all over the world. It is one of the most common causes of morbidity and mortality in patients

undergoing clinical, diagnostic, and therapeutic procedures. As a result of rising healthcare costs and overstretching of existing health-care resources, hospital-acquired infections are a major setback in patient care. This lack of compliance could be attributed to a lack of sufficient facilities, such as infection control training programmes in the department, in addition to a lack of understanding.

The findings were similar to those of a research conducted in Malawi, which revealed a lack of knowledge among the radiographers working in radiology departments in Malawi.

Limitations

The study was conducted only in hospitals of North Kashmir.

References

1. <https://www.cancer.gov/publications/dictionaries/cancer-terms/def/infection>.
2. <https://www.rxlist.com/infection/definition.htm>
3. <https://www.healthline.com/health/infections#2>

4. <http://www.betterhealth.vic.gov.au/health/conditionsAndTreatments/infections-in-hospital-reduce-the-risk>
5. National Health services professional handbook 2010.
6. <https://www.sfcddp.org/communicable-disease/infection-control-practices/>
7. Dancer SJ. Control of transmission of infection in hospitals requires more than clean hands. *Infection Control & Hospital Epidemiology*. 2010 Sep;31(9):958-60.
8. Infection Control Basics | Infection Control | CDC [Internet]. Cdc.gov. 2020 [cited 15 March 2020]. Available from: <https://www.cdc.gov/infectioncontrol/basics/index.html>.
9. Infection Control Basics | Infection Control | CDC [Internet]. Cdc.gov. 2020 [cited 15 March 2020]. Available from: <https://www.cdc.gov/infectioncontrol/basics/index.html>.
10. Infection Control Basics | Infection Control | CDC [Internet]. Cdc.gov. 2020 [cited 15 March 2020]. Available from: <https://www.cdc.gov/infectioncontrol/basics/index.html>
11. <https://www.cdc.gov/infectioncontrol/basics/transmission-based-precautions.html>

Glossary of Abbreviations

HIV: Human Immune Deficiency Virus

HSV: Herpes Simplex Virus

UTI: Urinary Tract Infection

VYI: Vaginal Yeast Infection

BSI: Blood Stream Infection

VAP: Ventilation Associated Pneumonia

SSI: Surgical Site Infection

CDC: Centre of Disease Control and Prevention

PPE: Personal Protective Equipment

MRSA: Methicillin-resistant Staphylococcus

MRSH: Methicillin-resistant Staphylococcus

PEGE: Pulse-field Gel Electrophoresis

SAR COVID-19: Severe Acute Respiratory Syndrome Coronavirus Disease of 2019

HAI: Healthcare Associated Infection

WHO: World Health Organization

ESR: European Society of Radiology

CT: Computed Tomography

USG: Ultra-Sonography