

**Summer Training at
Aditya Birla Memorial Hospital, Pune
(April 7–June 6, 2014)**

- **An Analytical Study on the Root Causes of the Delays in the Process of Radiological Investigations Ordered in the Intensive Care Unit**
- **Assessing the Awareness of Bio-Medical Waste Management Among the Staff of the Intensive Care Unit**

**By
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**Under the guidance of
Dr. Arindam Das**

**MBA- Hospital & Health Management (MBA-HM)
2013-2015**



**The IIHMR University, Jaipur
2014**

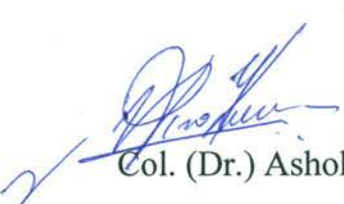
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CERTIFICATE

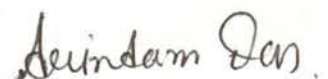
This is to certify that **Dr.Swati Singh** has undergone her summer training in **Aditya Birla Memorial Hospital, Pune** from 15th April 2014 to 9th June 2014. The candidate herself carried out all the studies related to her summer training. Her approach to the study has been scientific and analytical. This summer training is in the partial fulfilment of the course requirement recommended for the award of Post Graduate Diploma in Hospital and Health Management with specialisation in Hospital Management.

I wish her success in all her future endeavours.


Col. (Dr.) Ashok Kaushik

Dean (Academic & Student Affairs)

IIHMR Jaipur



Dr. Arindam Das

Associate Professor and

Associate Dean(Research)

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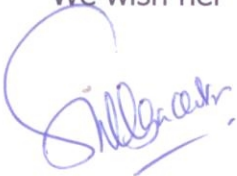
24th June 2014

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Dr. Swati Singh** has successfully completed her Internship projects on **"Assessing the Awareness of Bio Medical Waste Management among the staff of the Intensive Care Unit"** and **"An Analytical Study on the Root Causes of the Delays in the process of Radiological investigations ordered in the Intensive Care Unit"** at Aditya Birla Memorial Hospital, Pune from **15th April 2014 to 9th June 2014.**

During this tenure, her behaviour and conduct was good.

We wish her "All the Best" in her future endeavor.



Dr. Jayant Shelgaonkar
Sr. Consultant – ICU



Authorised Signatory
HR Department

Acknowledgement

I respect & thank **Mrs. Rekha Dubey, COO, Aditya Birla Memorial Hospital**, for giving me an opportunity to do my summer training in this prestigious organization.

The guidance and support received from **Dr Jayant Shelgaonkar, HOD, Dept. of Critical Care, ABMH** who contributed to these projects, was vital for the success of projects. I am grateful for his constant support and help.

I am also grateful to my mentor **Mr. Arindam Das** for his help and guidance for these projects.

I am obliged to staff members of ICU for the valuable information provided by them in their respective fields. I am grateful for their cooperation during the period of my assignment.

I also show my gratitude to all hospital staff who contributed in one way or the other in the course of the projects.

THE INTENSIVE CARE UNIT

The department of Intensive care medicine is dedicated to the best comprehensive and holistic tertiary care of patients at par with international standards. The unit is open 24 hrs. a day, 365 days a year and staffed by a team of experienced doctors, nurses and allied professionals. The unit is equipped with 52 critical care beds, which are operational in the MICU, SICU, TRAUMA and HDU with a capacity to expand up to 125 beds, with a 24*7 back up of a wide range of specialty services such as pathology and microbiology laboratory, imaging services, transfusion medicine, physiotherapy services and counseling services for patients' relatives.

LOCATION: Three units of the Intensive Care Unit namely the MICU, SICU and HDU are located on the 2nd floor. Another SICU mainly for trauma and neurosurgical patients, is located on the first floor.

LEVEL OF ICU-Level 3

TYPE-SEMI CLOSED

ISOLATIONS ROOMS-There are two isolation rooms with 2 beds each

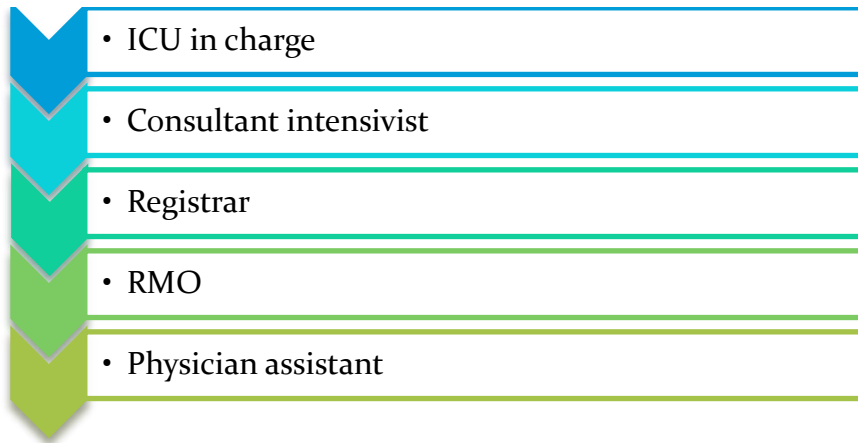
MONITORING SYSTEM-Bed side monitors are present per bed. A centralized monitoring system is located at each nurse station.

ICU TEAM

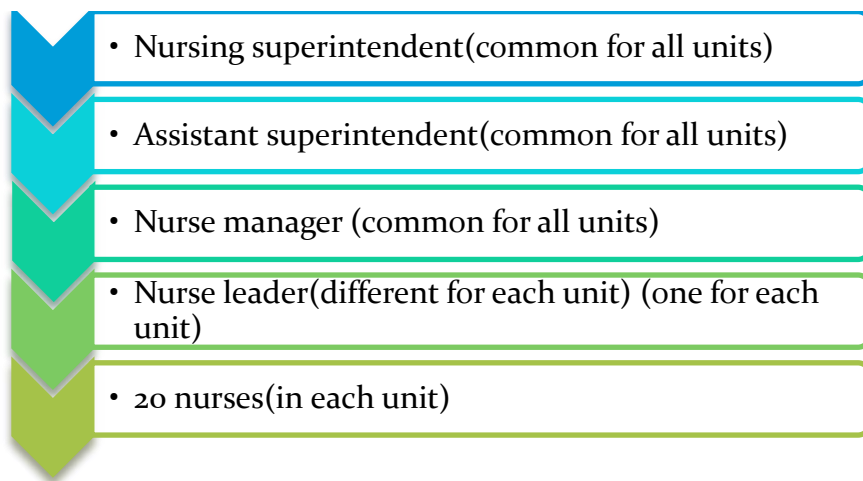
DOCTORS:

The Critical Care Unit is led by the Head of the Department (senior intensivist). The trauma and neurosurgical SICU is supervised by Assistant consultant who reports to the head of the department. The team also includes 5 consultants and 20 residents.

The organogram is



NURSING TEAM: The organogram for nursing team is:



HOUSEKEEPING

The housekeeping staff reports the housekeeping supervisor. No. of staff is allocated depending on the number of beds occupied, from the central housekeeping dept. of the hospital. Cleaning of the units is done 3 times a day and after a patient is discharged. There are 3 shifts for the housekeeping staff where each shift is for 8 hrs. each; each shift has 3-5 housekeeping staff in each unit on an Average

SECURITY

Two security guards for the entry/exit for the visitors(one male and one female at all times).They work in shifts of 8hours.For the night shift, one male guard is kept on duty.

FACILITIES FOR STAFF

There is one duty doctor room in each unit of the ICU.Each room has 2 beds,one wash basin and mirror, study table, charging points and drawers for storage.

Changing room and toilets present for the male and female staff respectively. There is also a beverage room where tea/coffee is served at regular intervals.

FACILITIES FOR VISITORS

A lounge is present for the visitors. It is equipped with comfortable chairs, a television, toilet, snacks and a reception area.Cubicles with one bed and storage each are present for the visitors are also present in the lounge. Prayer room and counseling room have been provided.

PROCESS OF PATIENT FLOW

Patients are transferred from the A&E dept. and the wards. No direct admission. Transfer of patients from here takes place to wards. The patients may be discharged directly from here in rare cases under medical advice

Some discharges are against medical advice on the wish of patient or his/her family

The record of each patient is received and accessed through central, computerized system using software called hybrid magnum and parallel run(occasionally)

The details of each patient, namely tests, diagnosis, treatment and prescription are entered in the system on a regular basis.

HEATING VENTILLATION AND AIR CONDITIONING SYSTEM OF ICU(HVAC)

Centralized Air conditioning present. One AHU(Air Handling Unit) present in each unit of the ICU.The temperature maintained in the range of 20-25 degree Celsius.If variation temperature is required, the engineering dept. is informed about the same.Air flow is maintained from clean to dirty areas through pressure differences

The pressure difference for isolation rooms is ≥ 3 Pascal

HEPA filters are present in the SICU

Humidity maintained is 45-55

**AN ANALYTICAL STUDY ON THE ROOT CAUSES OF
THE DELAYS IN THE PROCESS OF RADIOLOGICAL
INVESTIGATIONS ORDERED IN THE INTENSIVE
CARE UNIT OF ADITYA BIRLA MEMORIAL
HOSPITAL,PUNE**

Project 1

INTRODUCTION

Radiological investigations have a very important role in coming to an accurate diagnosis as well as in monitoring the condition of the patients under intensive care.

This study was undertaken in the Intensive care unit of Aditya Birla Memorial Hospital, Pune to recognize the delays in the process of these investigations and analyze the causes of the delays. The study was undertaken over a period of twelve working days through observations in three units of the Intensive care Unit.

It was observed that the delays occurred at mainly three levels: transporting patients to radiology department, sending request forms for obtaining the processed films and receiving the printed report.

LIST OF CHARTS

Chart no.	Chart title
	A) Portable x-rays taken between 8am to 6pm
1.1, 1.2	Time lapse between order time & informing radiology dept.
1.3, 1.4	Time lapse between order time & X-ray taken time
1.5, 1.6	Time lapse between filling & sending of request forms
1.7, 1.8	Time lapse between x-ray time and reporting by radiologist
1.9, 2.0	Time lapse between reporting time & time of receiving report
	B) Portable x-rays taken at night & in morning before 8am
2.1, 2.2	Time lapse between order time & informing radiology dept.
2.3, 2.4	Time lapse between order time & X-ray taken time
2.5, 2.6	Time lapse between filling & sending of request forms
2.7, 2.8	Time lapse between x-ray time and reporting by radiologist
2.9, 3.0	Time lapse between reporting time & time of receiving report
	C) CT/MRI investigations
3.1, 3.2	Time lapse between order time & informing radiology dept.
3.3, 3.4	Time lapse between order time & investigation time
3.5, 3.6	Time lapse between filling & sending of request forms
3.7, 3.8	Time lapse between investigation time and reporting by radiologist
3.9, 4.0	Time lapse between reporting time & time of receiving report
	D) USG investigations
4.1, 4.2	Time lapse between order time & informing radiology dept.

4.3, 4.4	Time lapse between order time & investigation time
4.5, 4.6	Time lapse between filling & sending of request forms
4.7, 4.8	Time lapse between investigation time and reporting by radiologist
4.9, 5.0	Time lapse between reporting time & time of receiving report
	E) Various time lags for each investigation compilation
5.1	Portable x-rays between 8am -6pm
5.2	Portable x-rays at night and between 8am
5.3	CT/MRI investigations
5.4	USG investigations
	F)Step wise time lags of all investigations
5.5	Time lapse between order time & informing radiology dept.
5.6	Time lapse between order time & investigation time
5.7	Time lapse between filling & sending of request forms
5.8	Time lapse between investigation time and reporting by radiologist
5.9	Time lapse between reporting time & time of receiving report

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RESEARCH PROBLEM

What are the main causes of the delays seen in the process of radiological investigations ordered in the Intensive Care Unit of Aditya Birla Memorial Hospital, Pune?

OBJECTIVES

To observe the procedure of radiological investigations undertaken on the patients of the critical care unit.

To identify the delays in the process.

To analyze the delays and the reasons behind them.

To give solutions to reduce the delays.

RATIONALE

Radiological investigations form the basis of the providing diagnosis as well as monitoring the condition of the critically ill patients.

This study analyses the procedure of the radiological investigations ordered in the CCU and aims to find the points in the procedure where delay may be occurring.

The identification of the reasons of the delays will help in reducing the total turnaround time of these investigations and thus enable to provide recommendations for prompt reporting.

REVIEW OF LITERATURE

Radiology is central to the clinical practice of medicine across a wide range of disciplines. It is the best practical way to diagnose, monitor treatment and detect progression or relapse of many important and common diseases in a minimally invasive and anatomically precise manner.

A variety of devices are used in the intensive care unit for long durations. Each one of them is a double-edged sword: intended to save life, but life-threatening if in the wrong place. Hence, it is important to periodically check that these devices are correctly placed so as to prevent complications. The portable chest radiograph is of tremendous value in this context.

The chest radiograph (CXR) plays a crucial role in critically ill patients in intensive care units. It is the most common radiological investigation ordered due to its diagnostic value in cardio-respiratory disease. In addition, it is extremely useful for evaluating the position of various tubes, lines and other devices and for detecting related complications. [1]

CT scanning is useful to get a very detailed 3D image of certain parts of the body, such as soft tissues, the pelvis, blood vessels, the lungs, the brain, abdomen, and bones. A scan of the head can provide the doctor with important information about the brain - he/she may want to know whether there is any bleeding, swelling of the arteries, or tumors. A CT scan will tell the doctor whether the patient has a tumor in his/her abdomen, and whether any internal organs in that area are swollen or inflamed. It will reveal whether there are lacerations of the spleen, kidneys or liver. A scan can also provide valuable data on the patient's vascular condition. Vascular refers to blood flow. Many vascular conditions can lead to stroke, kidney failure, and even death. It can help a doctor assess bone diseases, bone density, and the state of the patient's spine. It can reveal vital data about injuries to the patient's hands, feet and other skeletal structures - even small bones can be seen clearly, as well as their surrounding tissue. [2]

An MRI scan can create clear pictures of most parts of the body. So, it is useful for all sorts of reasons where other tests (such as X-rays) do not give enough information required. It is commonly used to get detailed pictures of the brain and spinal cord, to detect abnormalities and tumors. Even torn ligaments around joints can be detected by an MRI scan. [3]

The use of ultrasound has expanded enormously over the last two decades in critical care research and practice. Despite the fact that the method has several inherent limitations and is largely operator dependent, it enables clinicians for rapid, by-the-bed, and relatively inexpensive diagnostic evaluation of unstable patients. Point-of-care ultrasound applications such as lung ultrasound are gradually replacing traditional imaging modalities (i.e., chest X-rays), while the

use of ultrasound for procedure guidance has been shown to reduce complications and thus to increase patients' safety [4]

All these investigations form a major role in the treatment of critically ill patients. It is extremely important that the investigations are done on time to help the doctors in the best possible way.

RESEARCH METHODOLOGY

Radiographic investigations ordered in 3 units of the Critical Care Unit; MICU and two SICUs were observed from 21/4/14 to 2/5/14. The duration of observation was 8:30am to 6pm.

The two units on the second floor namely the MICU and SICU were observed from 21/4/14 to 27/4/14 and observations in the first floor SICU were made from 28/4/14 to 2/5/14.

STUDY DESIGN: ANALYTICAL STUDY

SAMPLE SIZE: 137

SAMPLING TECHNIQUE: The sampling technique used was Convenience Sampling. The investigations that were ordered during the study hours were included. The Portable x-rays ordered during night rounds and were also included since these investigations were carried out the next day in the morning. The sample size for the various investigations are as follows:

Portable X-rays ordered between 8:30am-6pm: 36

Portable X-rays ordered at night and before 8:30am: 64

CT/MRI investigations: 24

USG investigations: 13

DATA COLLECTION TECHNIQUE:

Primary Data: Observations, informal interviews of nursing and housekeeping staff

Secondary Data: HIS (Hybrid Magnum software & Picture Archives and Communication System (PACS))

OBSERVATIONS

The usual process flow after a radiological investigation being ordered for a patient is:

Ordering a CR (credit receipt) using the hybrid magnum software and getting a print out



Making a phone call to the radiology department and informing about the investigation to be carried out. In case of CT and MRI investigations, call also has to be placed in the IP transport department to take the patient to the radiology department.

In case of USG investigation, a written request is sent to the radiology department through a housekeeping staff.



To take an x-ray, a technician accompanied by a housekeeping staff arrives from the radiology department. The portable x-ray machine is present in the ICU whereas the cassette is brought by the technician.

For taking the patient for CT or MRI investigations, IP transport staff arrives and takes the patient to the radiology department, accompanied by a staff of the ICU

In case of USG investigation, portable USG machine is brought by the housekeeping staff of radiology department. The investigation is done by the radiologist in the ICU following which the portable USG machine is taken back.



The nurse in charge of the patient fills in a request form for receiving the radiograph/film. This request form is sent to the radiology department through a housekeeping staff.



The film is dispatched from the Radiology department. The film is either sent through the housekeeping staff of the ICU department carrying the request form or sent later through the housekeeping staff of the radiology department.



The report of the investigation is sent by the radiology department through their housekeeping staff when it is ready. Sometimes, when report is urgently needed, request is sent from the ICU for the report.

Picture Archives and Communication Software (PACS)-A part of the HIS, PACS is a software where the details of the radiologic investigations ordered throughout the hospital along with the radiographic image and report is uploaded on a regular basis.

The observations were made to make note of the timings of the following steps for each investigation:

1. The time at which the investigation is ordered i.e. the order time
- 2 The time at which phone call is placed to the radiology dept. to inform about the investigation to be done
- 3 The time at which the portable X-ray/USG is done and the time the patient is taken to the Radiology dept. (for CT/MRI cases.)
4. The time at which the request form for receiving the film is filled
5. The time at which this request form is sent to the dept. of radiology via the housekeeping staff.
6. The time at which the report of the investigation is received in the ICU.

The time at which the radiologist did the reporting of the investigated was collected from the HIS software

The investigations were grouped into 4 categories namely,

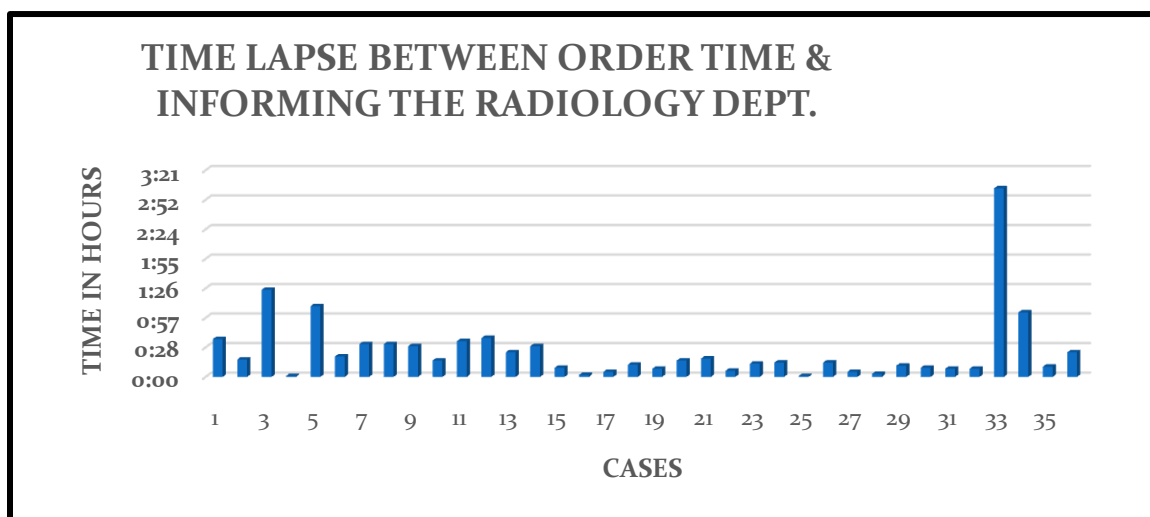
1. Portable X-rays ordered between 8am to 6pm
2. Portable X-rays ordered at night and in the mornings before 8am
3. CT/MRI scans
4. USG

For each investigation, the timings at each step were noted to calculate time lags in-between the steps of the entire process from ordering of the investigation to receiving the report. These time lags were then plotted on a graph

1. Portable X-rays ordered between 8am to 6pm

The total number of cases were 36.

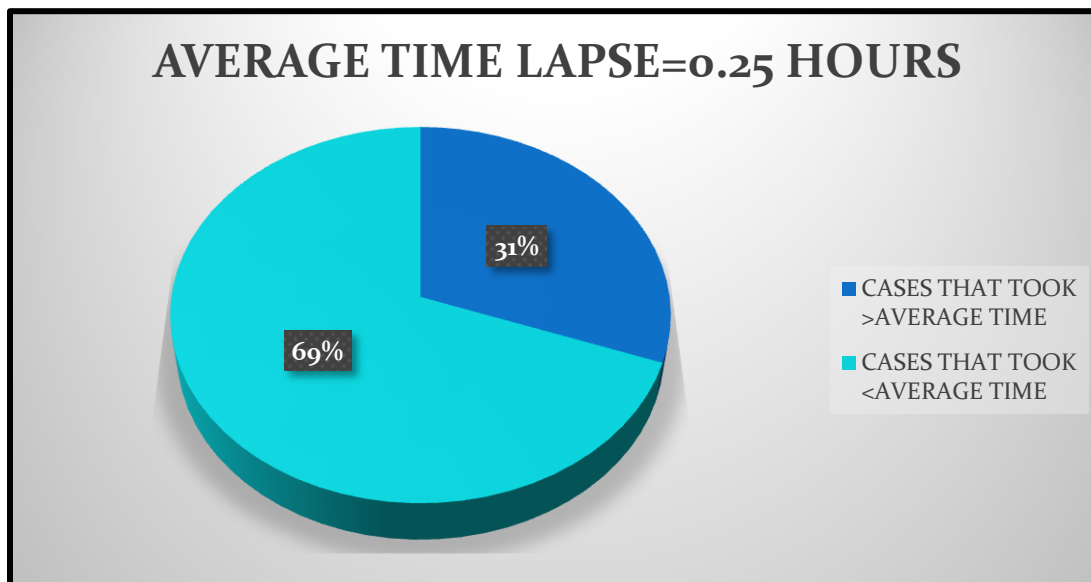
FIGURE 1.1: TIME LAPSE BETWEEN ORDER TIME AND TIME AT WHICH THE RADIOLOGY DEPT. WAS INFORMED



N=36

The figure represents the time lapse between ordering of the investigations and the time at which the nursing staff placed a call to the radiology dept. The maximum time lag was seen to be 2.58hours. The majority of the cases showed lag between 10 minutes to 30 minutes in the initial step of informing the radiology dept. regarding the investigation to be carried out.

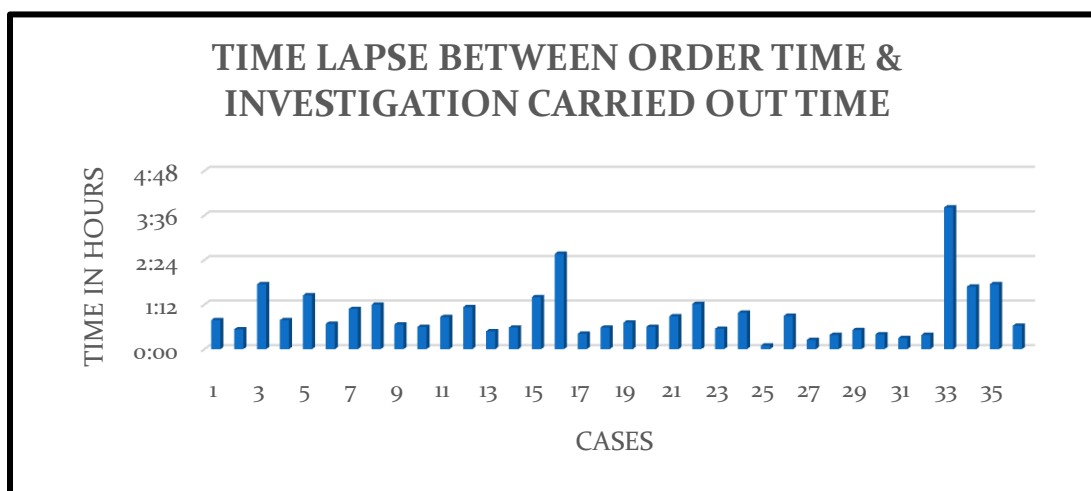
FIGURE 1.2: NUMBER OF CASES THAT TOOK MORE TIME THAN THE AVERAGE TIME LAPSE



N=36

The **average time lag at this step was 0.25 hours**. The number of cases that had a time lapse of more than 0.25 hours were 11 and constituted 31% of all the portable x-rays ordered between 8:30am and 6pm.

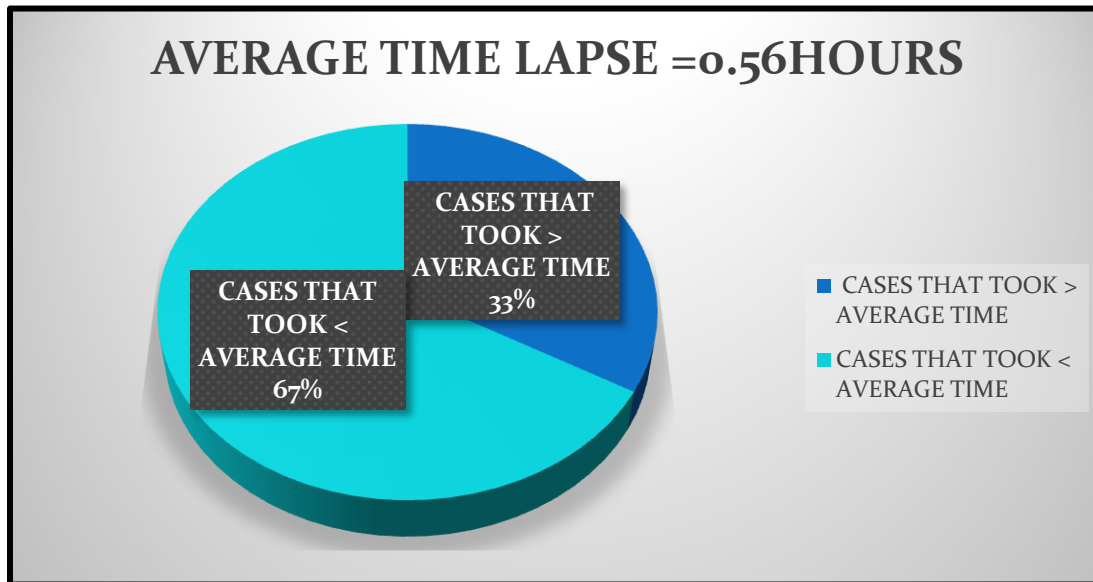
FIGURE 1.3: TIME LAPSE BETWEEN ORDER TIME & THE TIME AT WHICH X-RAY WAS TAKEN



N=36

The figure represents the time lapse between the time at which investigations were ordered and the time they were carried out. The maximum time was found to be 3.45 hours. The majority of the cases had a lag of 10 minutes till 1 hour 30 minutes between ordering the investigation and it being done.

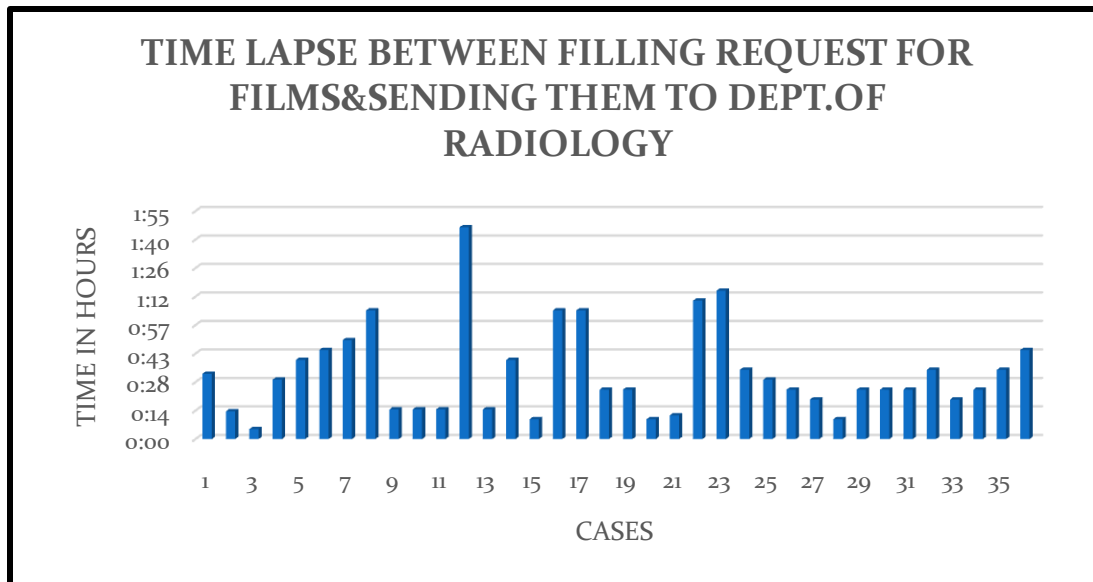
FIGURE 1.4: NUMBER OF CASES THAT TOOK MORE TIME THAN THE AVERAGE TIME LAPSE



N=36

The **average time lapse was 0.56 hours** and the number of cases in which the lapse was more than 0.56 hours were 12 which constitute 33 % of the cases.

FIGURE 1.5: TIME LAG BETWEEN THE FILLING OF THE REQUEST FORM FOR RECEIVING THE FILM AND SENDING IT TO THE DEPT. OF RADIOLOGY

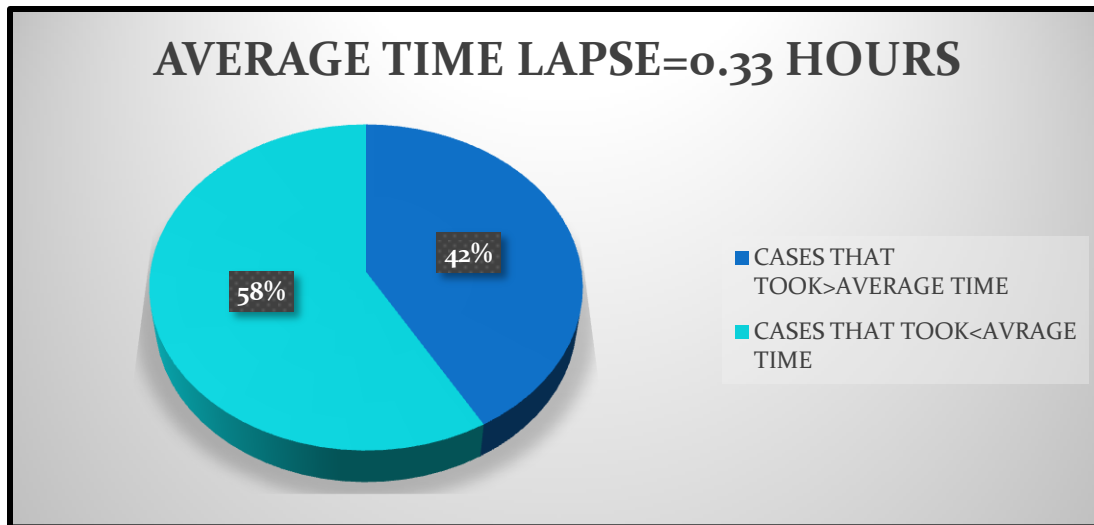


N=36

The figure represents the time lapse between filling request

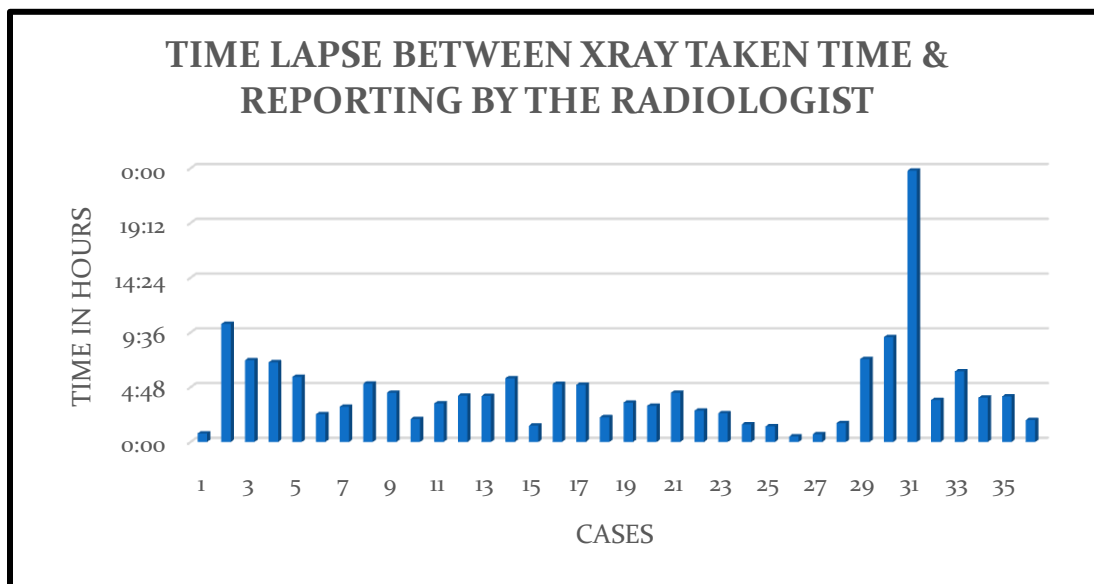
The **average time lapse was 0.33 hours** and the number of cases that had a lapse more than 0.33 hrs were 15. The maximum time lag was 1 hour 48 mins. The request forms after being filled by the nursing staff, were sent late to the Radiology department.

FIGURE 1.6: NUMBER OF CASES THAT TOOK MORE TIME THAN THE AVERAGE TIME LAPSE



N=36

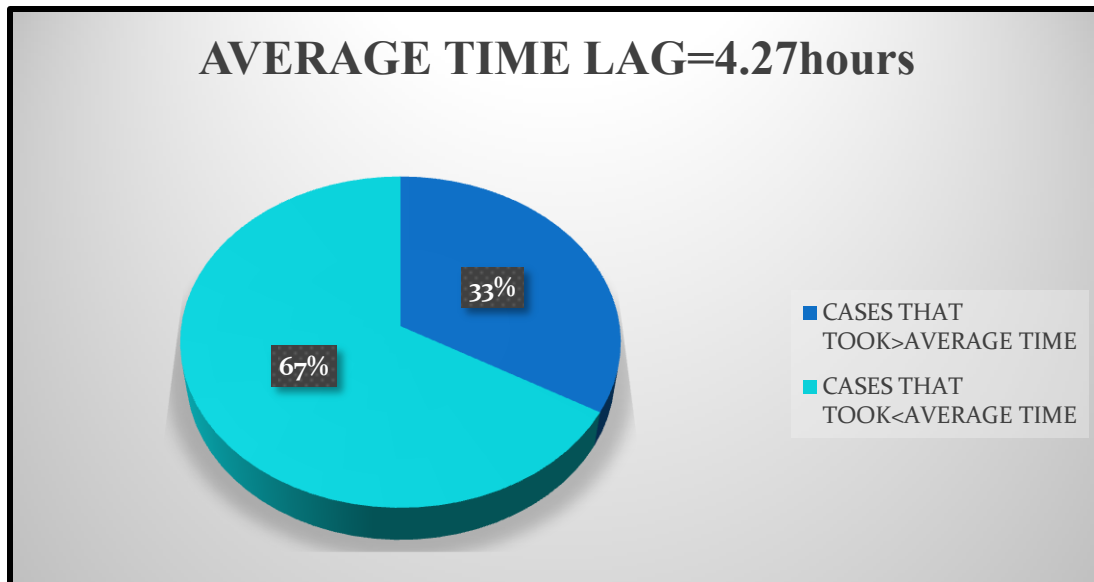
FIGURE 1.7: TIME LAPSE BETWEEN THE X-RAY TAKING TIME AND THE TIME AT WHICH THE RADIOLOGIST DID THE REPORTING



N=36

The average lag was 4.27 hours with certain cases showing lag even up to a day.

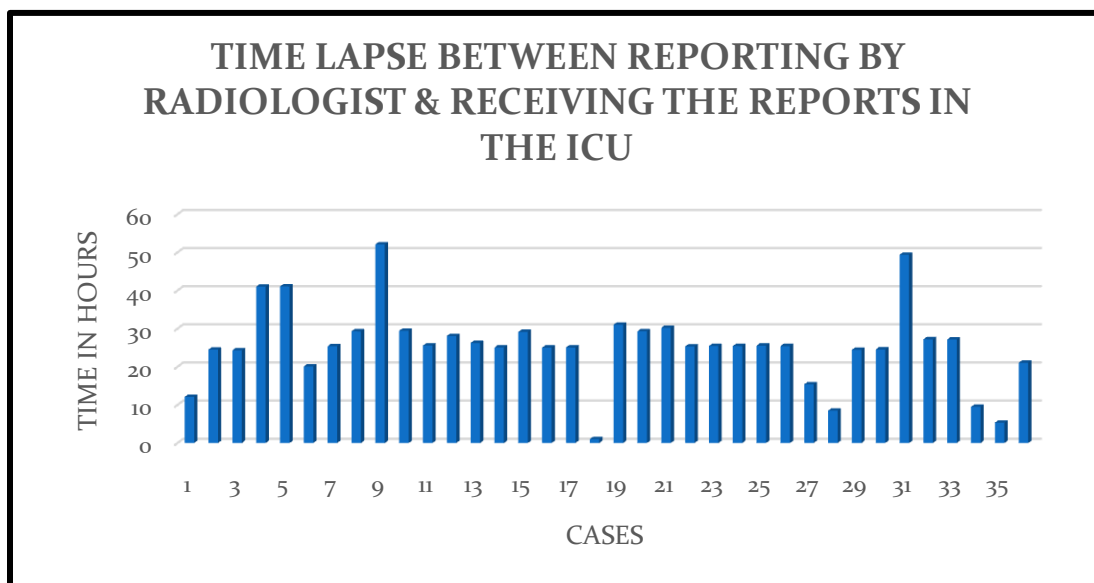
FIGURE 1.8: NUMBER OF CASES THAT TOOK MORE TIME THAN THE AVERAGE TIME LAPSE



N=36

The **average time lapse was 4.27 hours** and no. of cases that had a lapse more than 4.27hrs were 12. These cases constitute 33% of the cases.

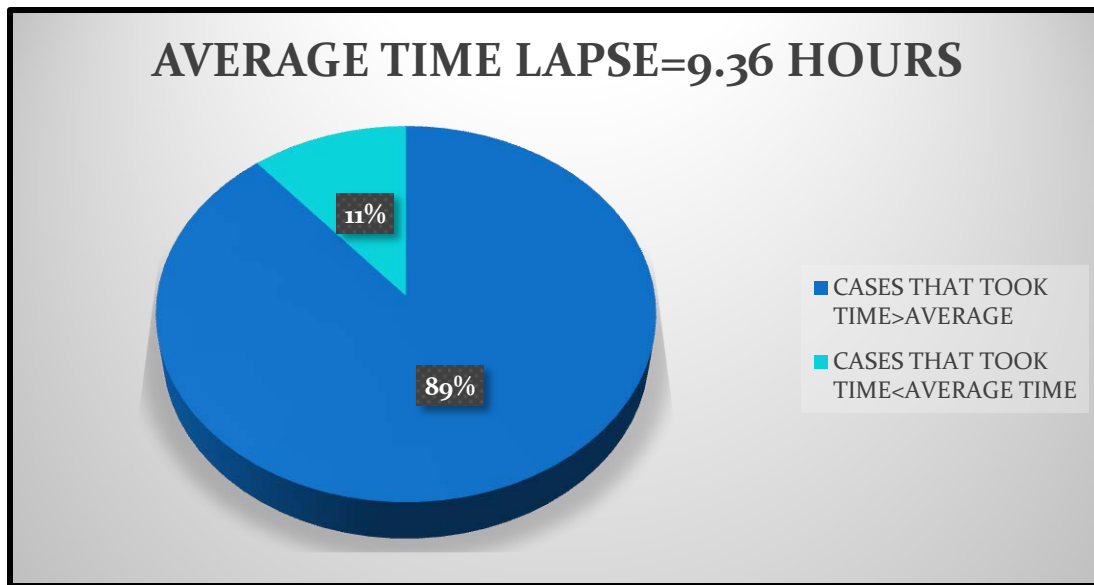
FIGURE 1.9: TIME LAPSE BETWEEN THE TIME REPORTING WAS DONE BY THE RADIOLOGIST AND THE TIME AT WHICH REPORT WAS RECEIVED IN THE ICU



N=36

This step had major time lags extending even up to 50 hours. This denotes lack of synchronization between the Radiology department and the ICU in sending the reports that have been prepared.

FIGURE 2.0: NUMBER OF CASES THAT TOOK MORE TIME THAN THE AVERAGE TIME LAPSE

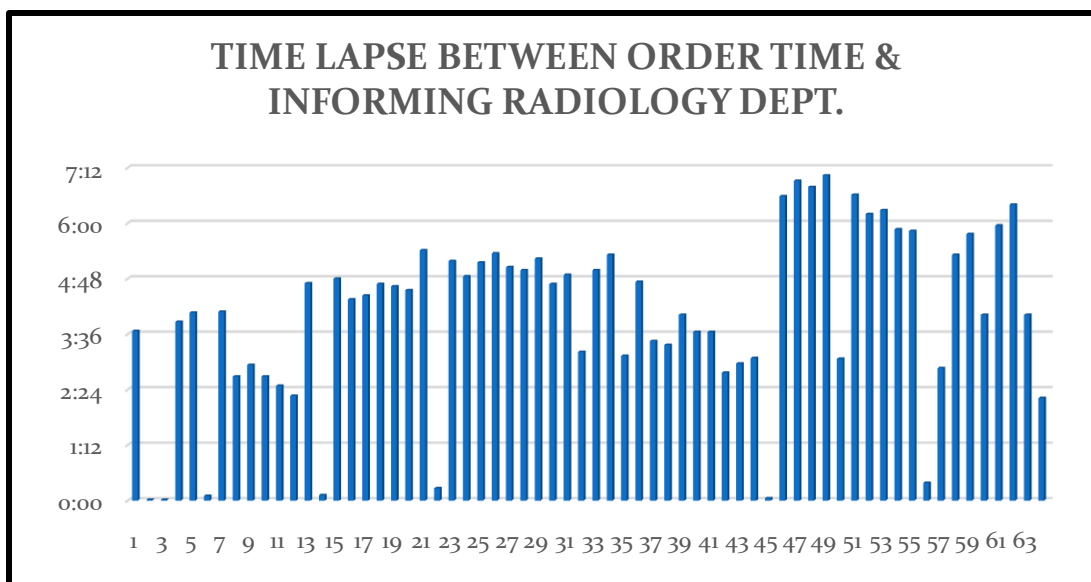


The **average time lapse was 9.36 hours** and the no. of cases that showed a lapse more than this were 32.

2. Portable X-rays ordered at night and in the morning before 8am.

Total number of cases =64

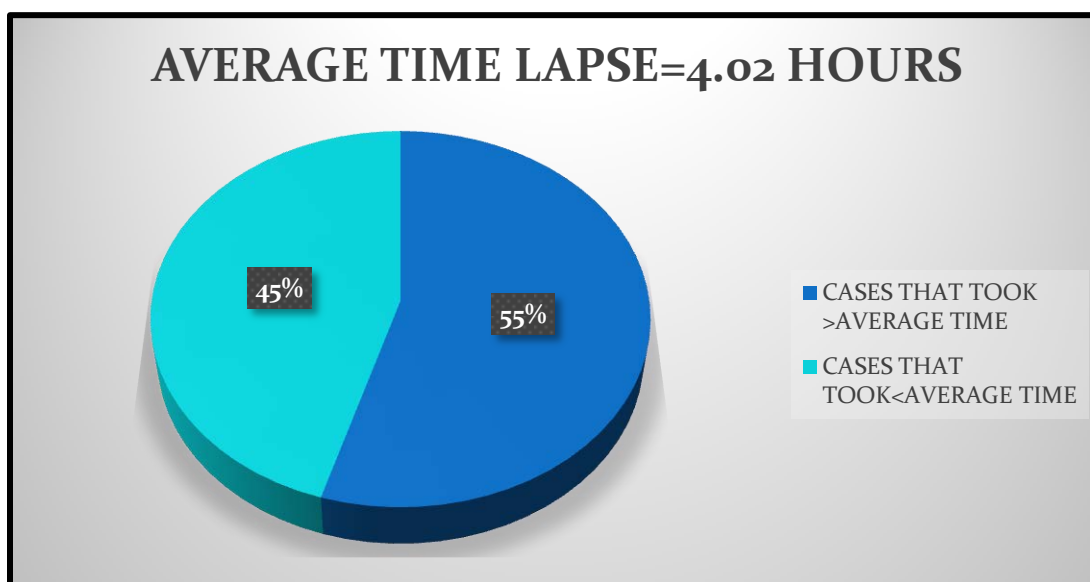
FIGURE 2.1: TIME LAPSE BETWEEN ORDER TIME AND TIME AT WHICH THE RADIOLOGY DEPT. WAS INFORMED.



N=64

These cases showed time lags up to 7 hours between ordering of the investigation & call for informing the radiology because the nursing staff on duty raised an order(Credit Receipt) at night but the information to the Radiology department is given in the morning.

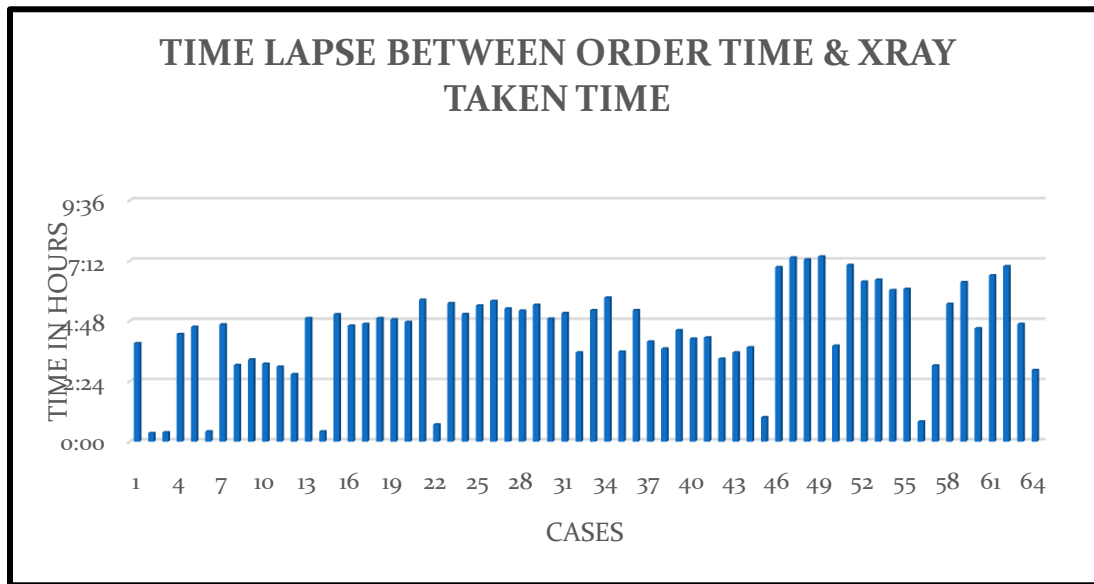
FIGURE 2.2: NUMBER OF CASES THAT TOOK MORE TIME THAN THE AVERAGE TIME LAPSE



N=64

The average time lapse was 4.02 hours and the number of cases that showed lapse more than this were 35.

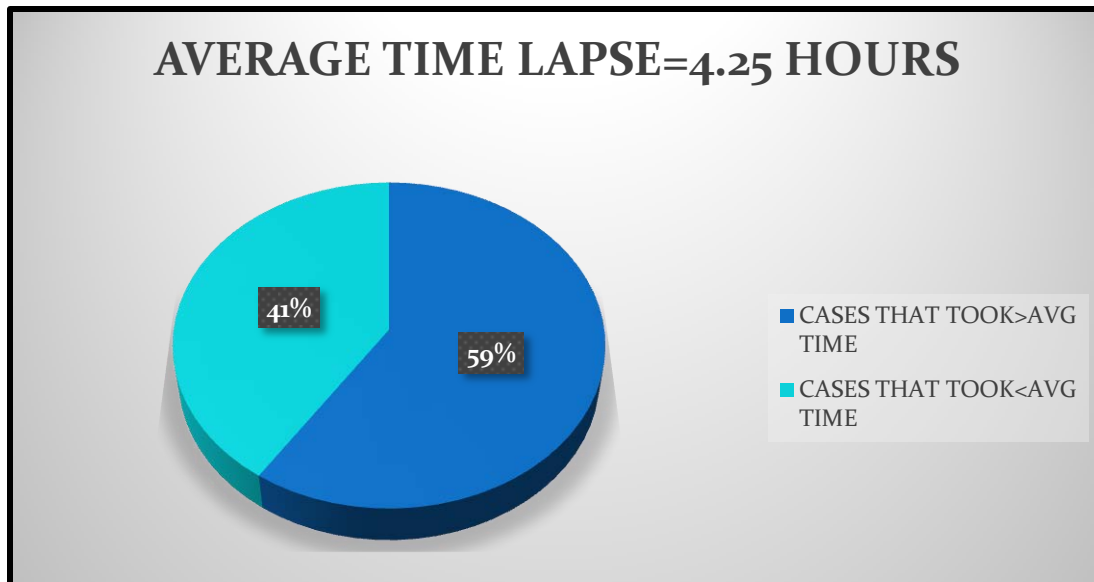
FIGURE 2.3: TIME LAPSE BETWEEN ORDER TIME AND TIME AT WHICH X-RAY WAS TAKEN



N=64

The time lags were high because the nursing staff on duty raised an order (Credit Receipt) at night but the information to the Radiology department is given in the morning.

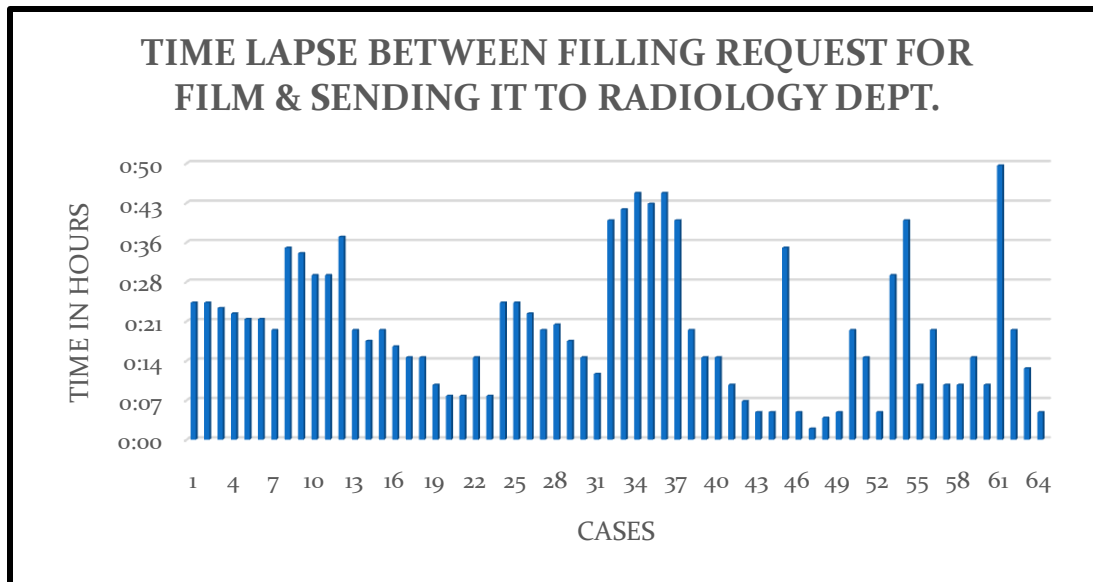
FIGURE 2.4: NUMBER OF CASES THAT TOOK MORE TIME THAN THE AVERAGE TIME LAPSE



N=64

The **average time lapse was 4.25 hours** and the no. of cases that took more than this time were 38 which constitute 59% of the cases.

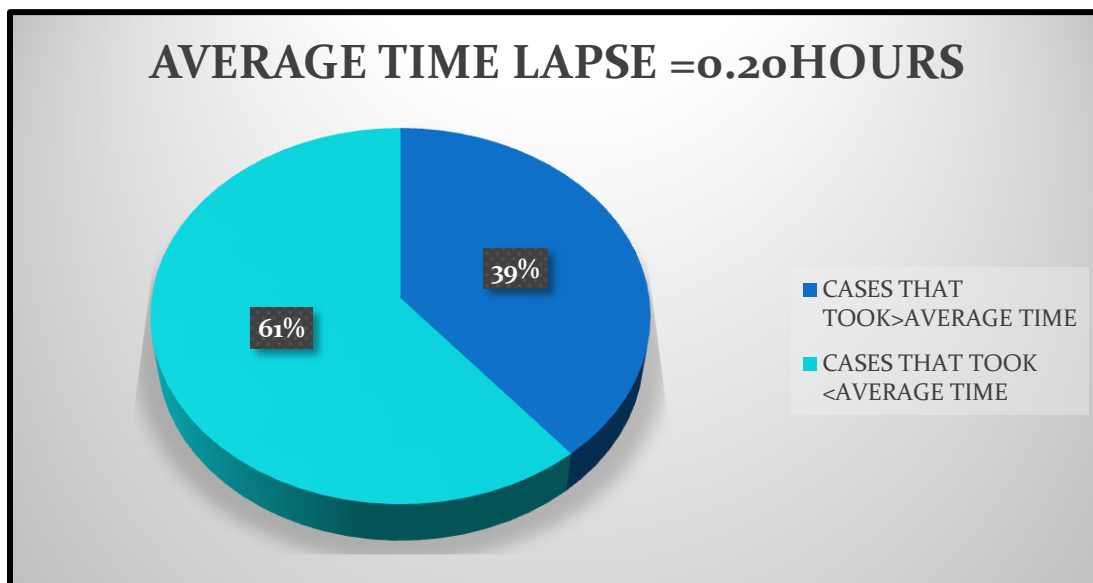
FIGURE 2.5: TIME LAPSE BETWEEN FILLING REQUEST FORMS AND SENDING THEM TO RADIOLOGY DEPT.



N=64

The time lags were 20 minutes on average.

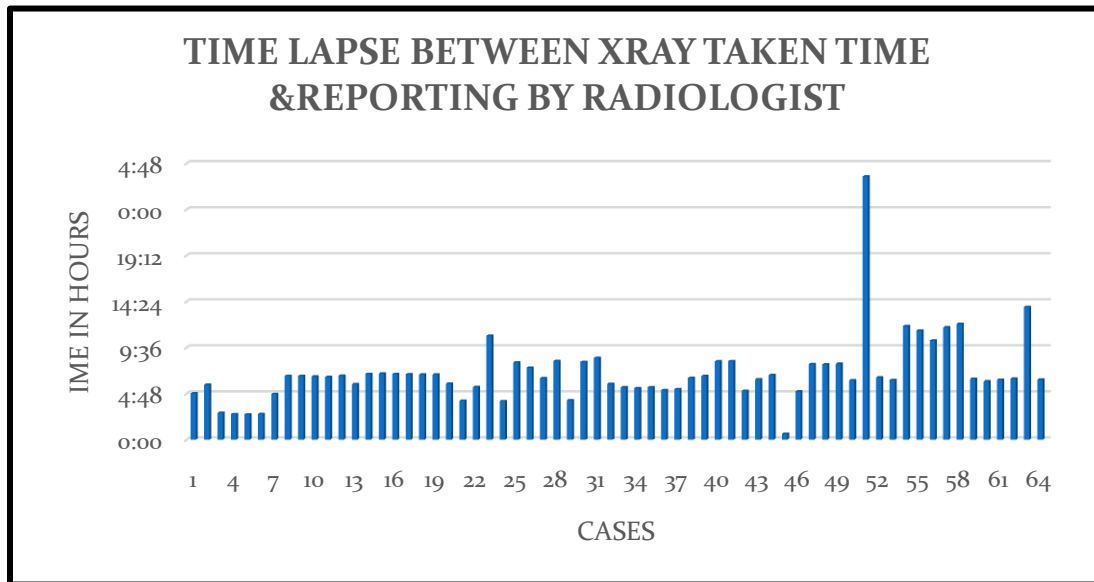
FIGURE 2.6: NUMBER OF CASES THAT TOOK MORE TIME THAN THE AVERAGE TIME LAPSE



N=64

The **average time lapse was 0.20 hours** and the no. of cases that took more than this time were 25 constituting 39 % of the cases.

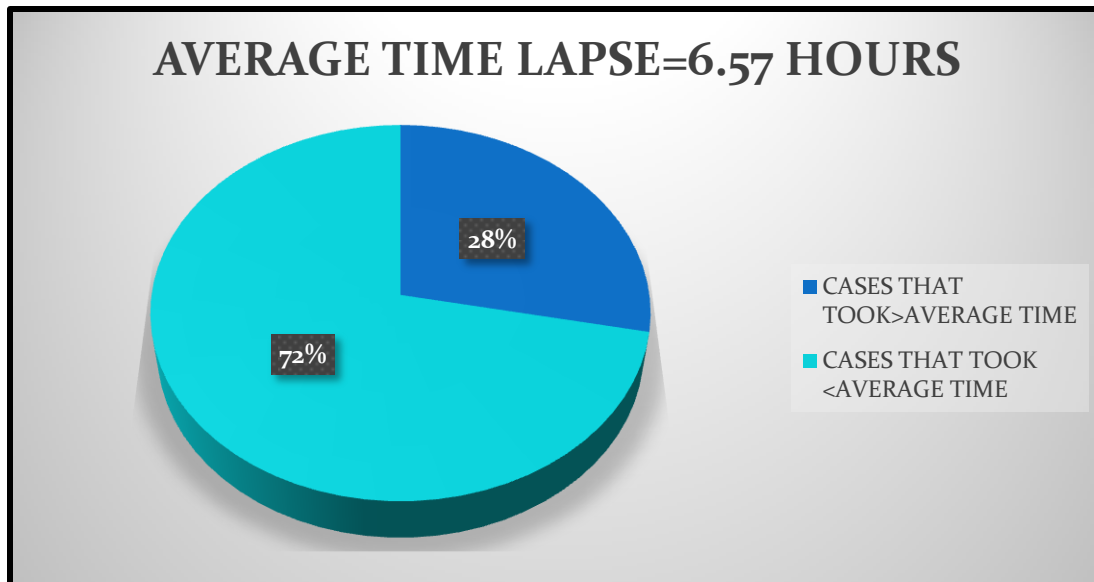
FIGURE 2.7: TIME LAPSE BET X-RAY TAKING TIME AND THE TIME AT WHICH REPORTING WAS DONE BY THE RADIOLOGIST.



N=64

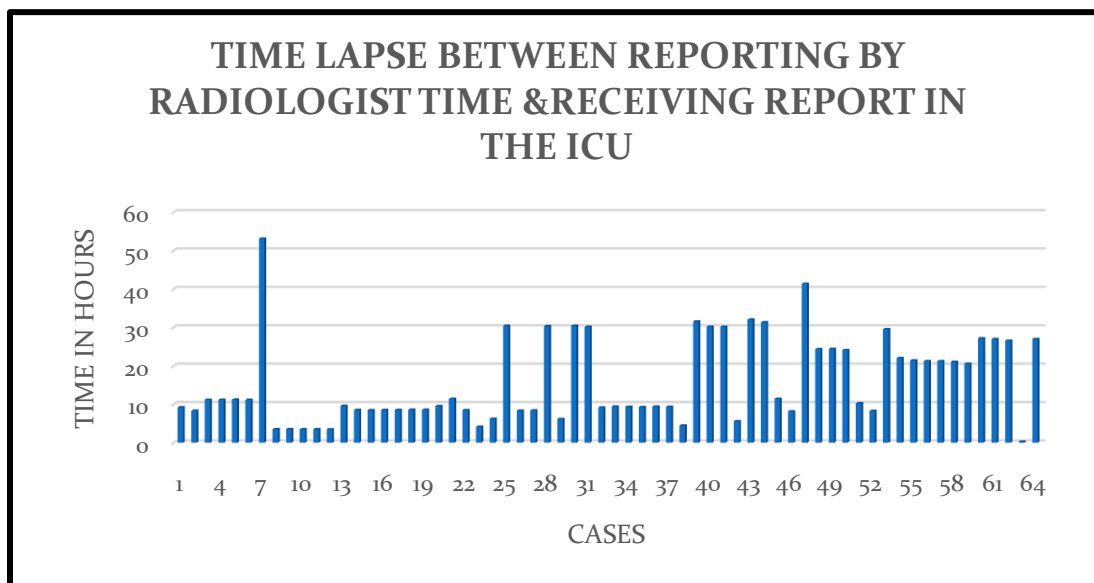
The average time lapse was 6.57 hours and the number of cases that took more than 6.57 hours were 18.

FIGURE 2.8: NUMBER OF CASES THAT TOOK MORE TIME THAN THE AVERAGE TIME LAPSE



N=64

FIGURE 2.9: TIME LAPSE BETWEEN THE TIME OF REPORTING BY RADIOLOGIST AND THE TIME OF RECEIVING THE REPORT IN THE ICU.



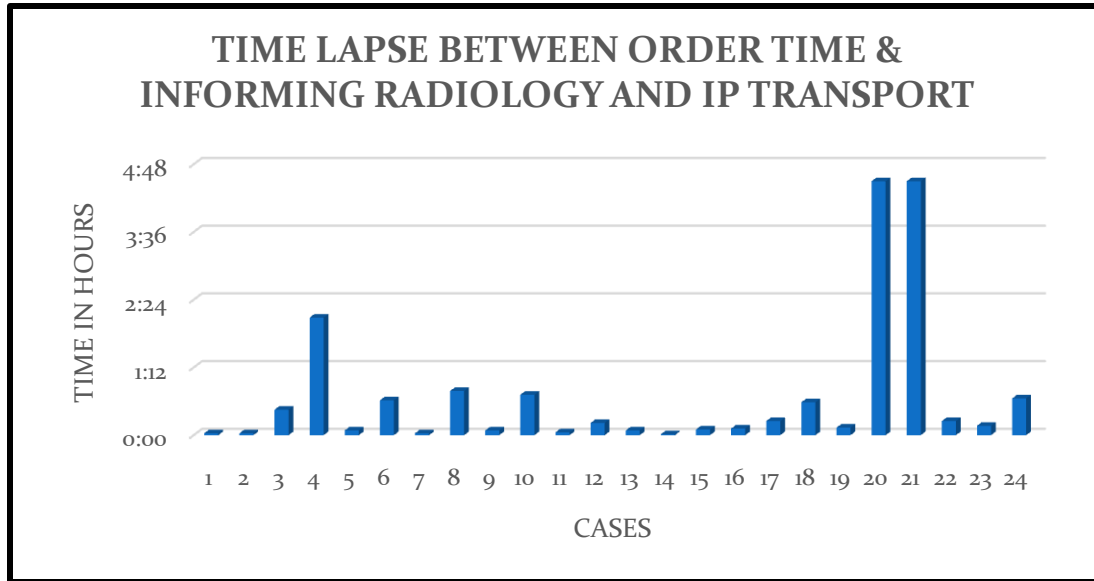
N=64

The **average time lapse was 15.38 hours** and number of cases that took more than this were 25.

3. CT/MRI

Total number of cases =24

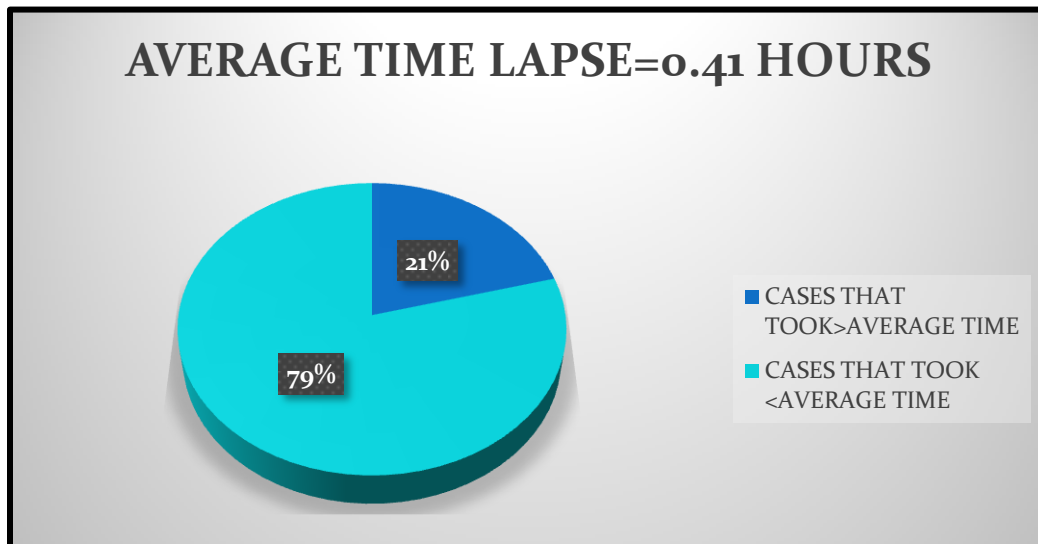
FIGURE 3.0: TIME LAG BETWEEN ORDER TIME & INFORMING THE DEPT.OF RADIOLOGY



N=24

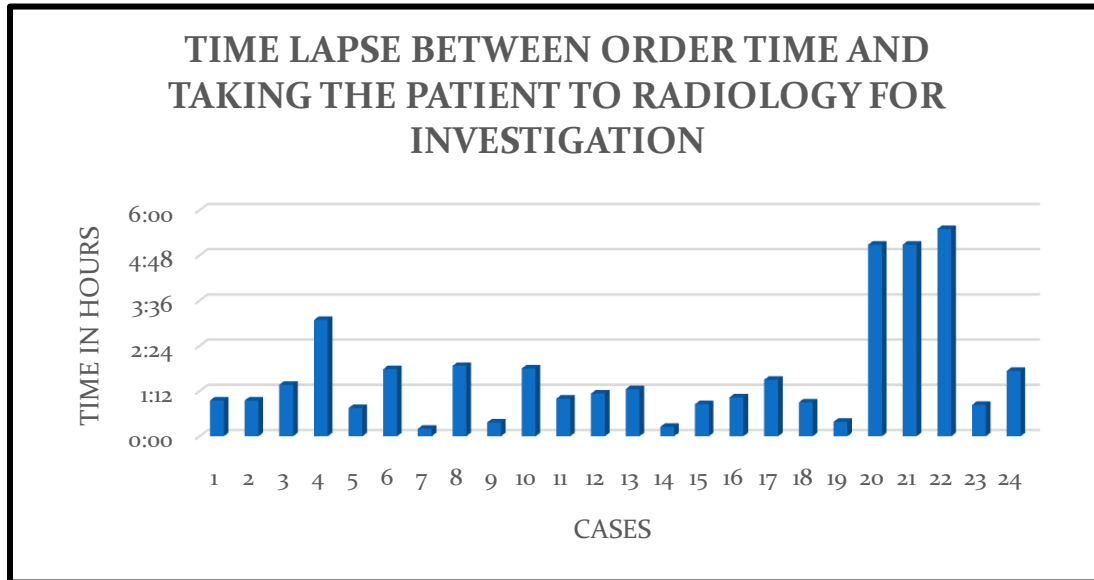
The **average time lapse was 0.41hours** and the number of cases that took more than this were 5.

FIGURE 3.1: NUMBER OF CASES THAT TOOK MORE TIME THAN THE AVERAGE TIME LAPSE



N=24

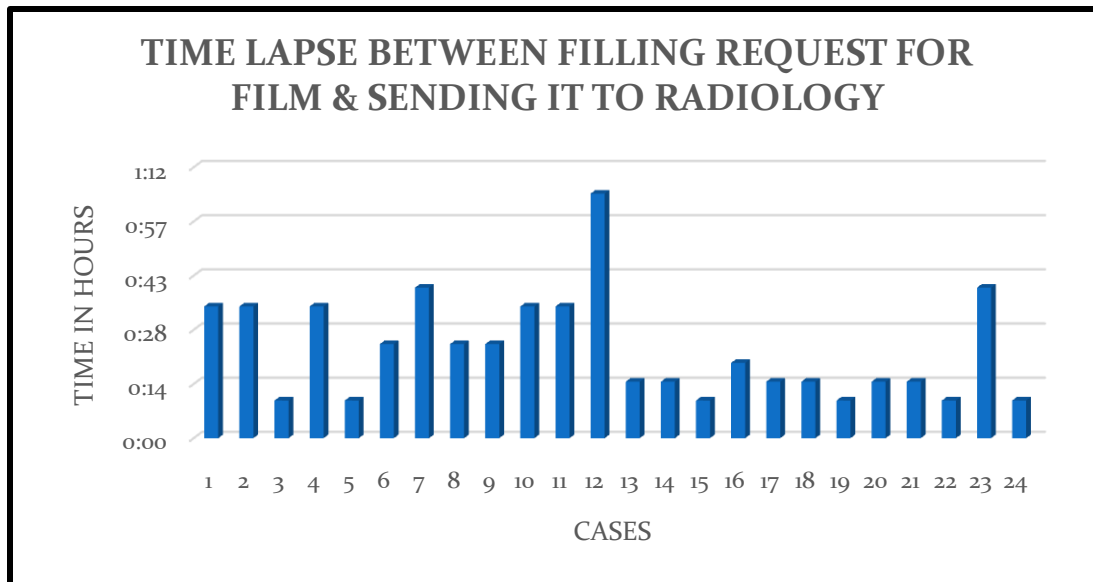
FIGURE 3.2: TIME LAPSE BETWEEN ORDER TIME & TIME OF TAKING THE PATIENT TO THE RADIOLOGY DEPT.FOR INVESTIGATION



N=24

The **average time lapse was 1.39 hours** and the number of cases which showed a lapse of more were 8

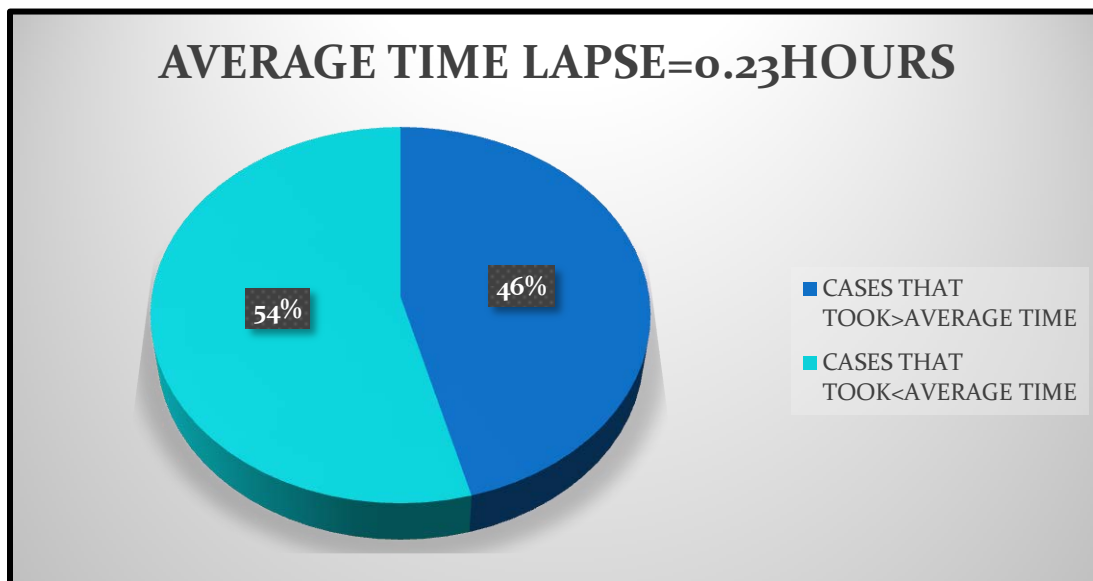
FIGURE 3.3: TIME LAPSE BETWEEN FILLING FORMS FOR REQUEST FOR FILMS & SENDING THEM TO THE DEPT.OF RADIOLOGY



N=24

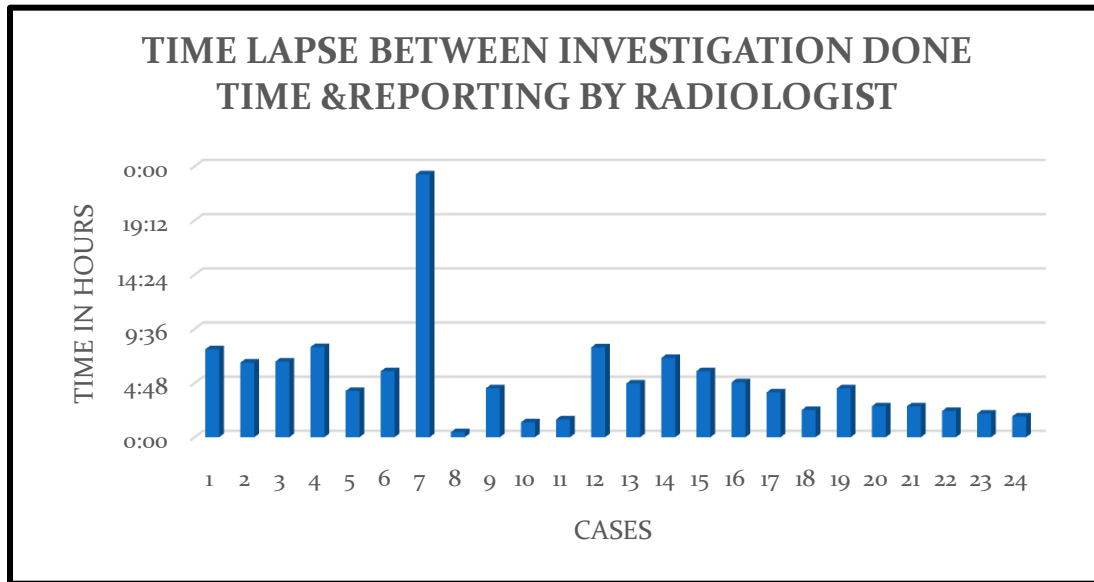
The **average time lapse was 0.23 hours** and the number of cases that showed lapse more than this were 11.

FIGURE 3.4: NUMBER OF CASES THAT TOOK MORE TIME THAN THE AVERAGE TIME LAPSE



N=24

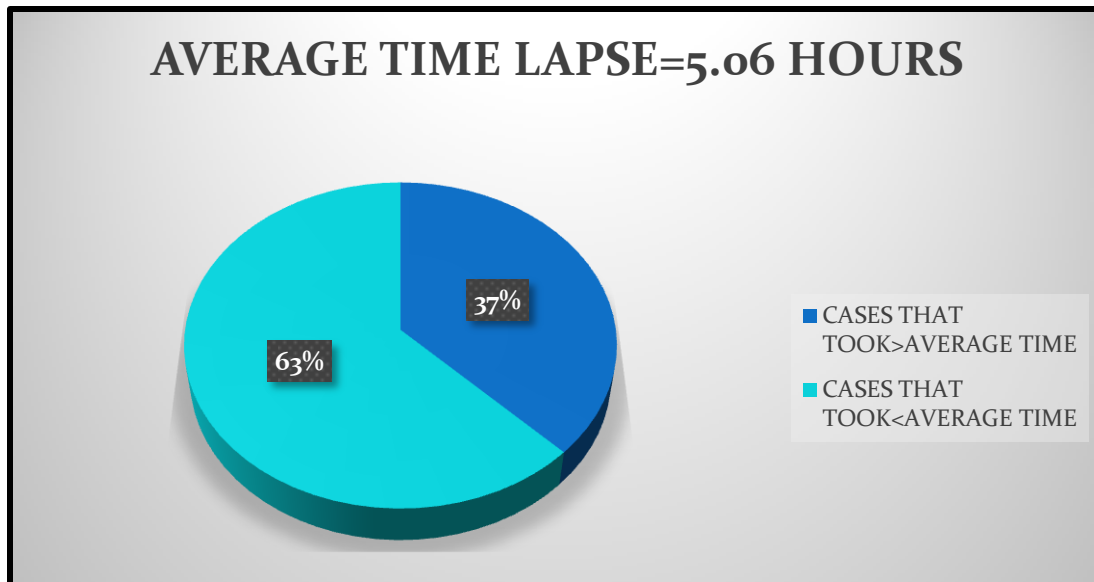
FIGURE 3.5: TIME LAPSE BETWEEN INVESTIGATION TIME AND TIME AT WHICH REPORTING WAS DONE BY THE RADIOLOGIST



N=24

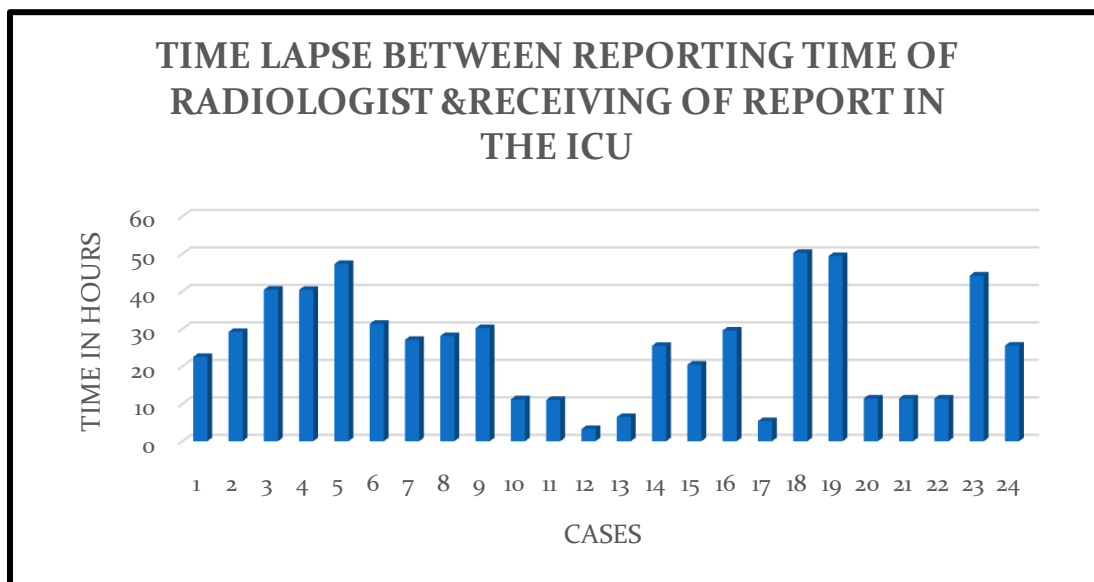
The **average time lapse was 5.06 hours** and the number of cases that showed lapse more than this were 9

FIGURE 3.6: NUMBER OF CASES THAT TOOK MORE TIME THAN THE AVERAGE TIME LAPSE



N=24

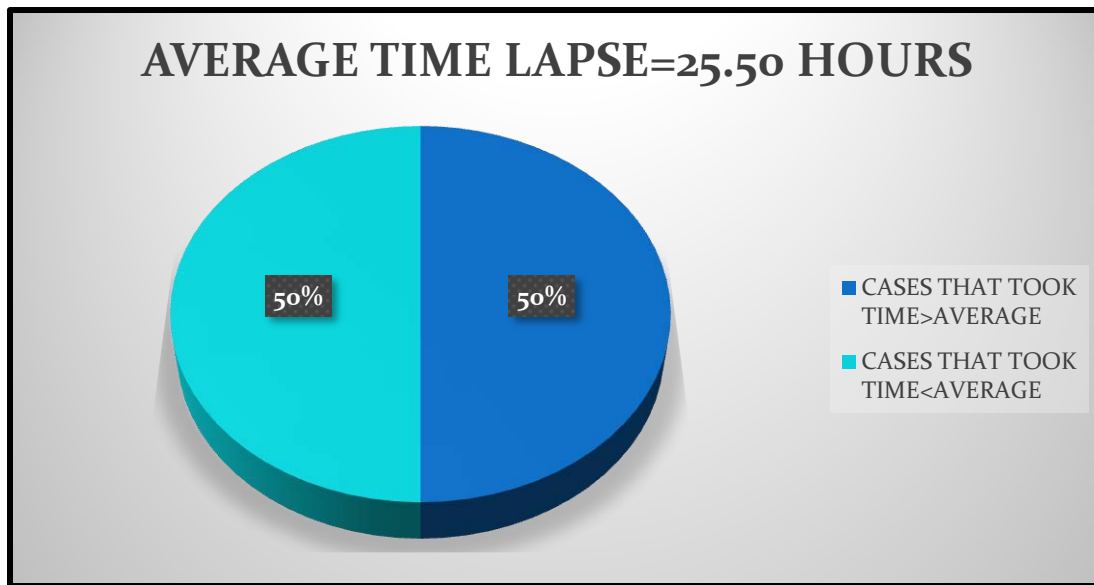
FIGURE 3.7: TIME LAPSE BETWEEN THE TIME AT WHICH RADIOLOGIST REPORTED AND THE TIME AT WHICH REPORTS WERE RECEIVED IN THE ICU.



N=24

The **average time lapse was 25.50 hours** and the number of cases that showed lapse more than this was 12.

FIGURE 3.8: NUMBER OF CASES THAT TOOK MORE TIME THAN THE AVERAGE TIME LAPSE

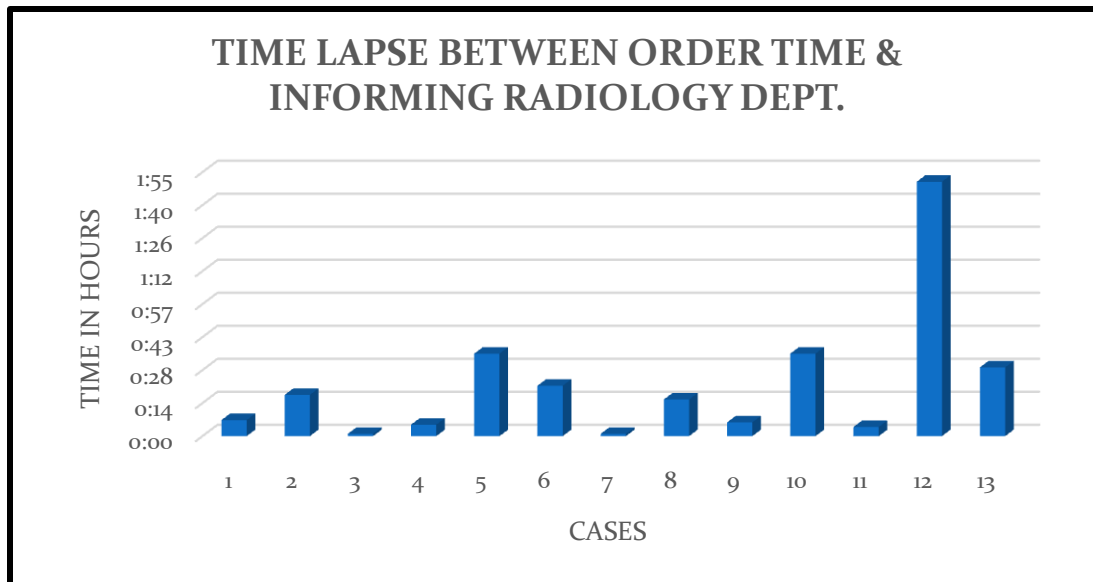


N=24

4. USG Investigations

Total number of cases=13

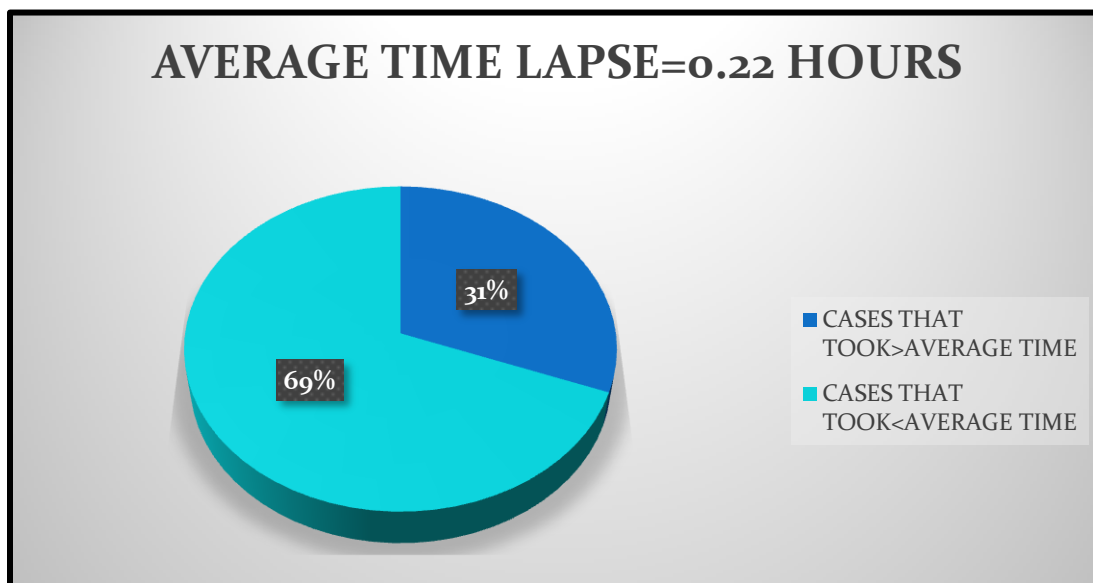
FIGURE 3.9: TIME LAPSE BETWEEN ORDER TIME & INFORMING THE DEPT.OF RADIOLOGY



N=13

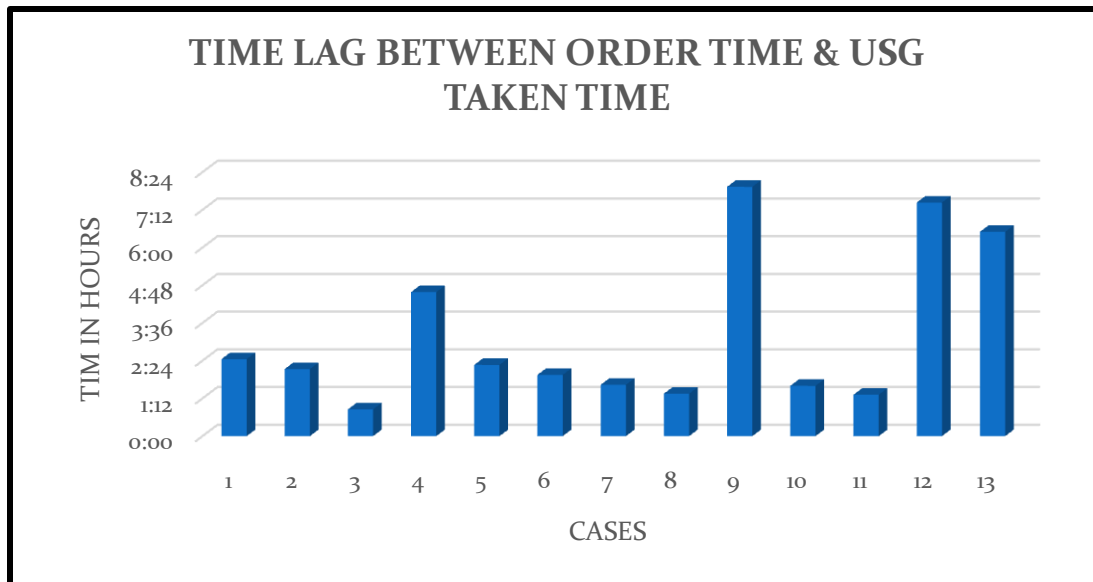
Average time lapse was 0.22 hours and the number of cases that showed lapse more than this were 4.

FIGURE 4.0: NUMBER OF CASES THAT TOOK MORE TIME THAN THE AVERAGE TIME LAPSE



N=13

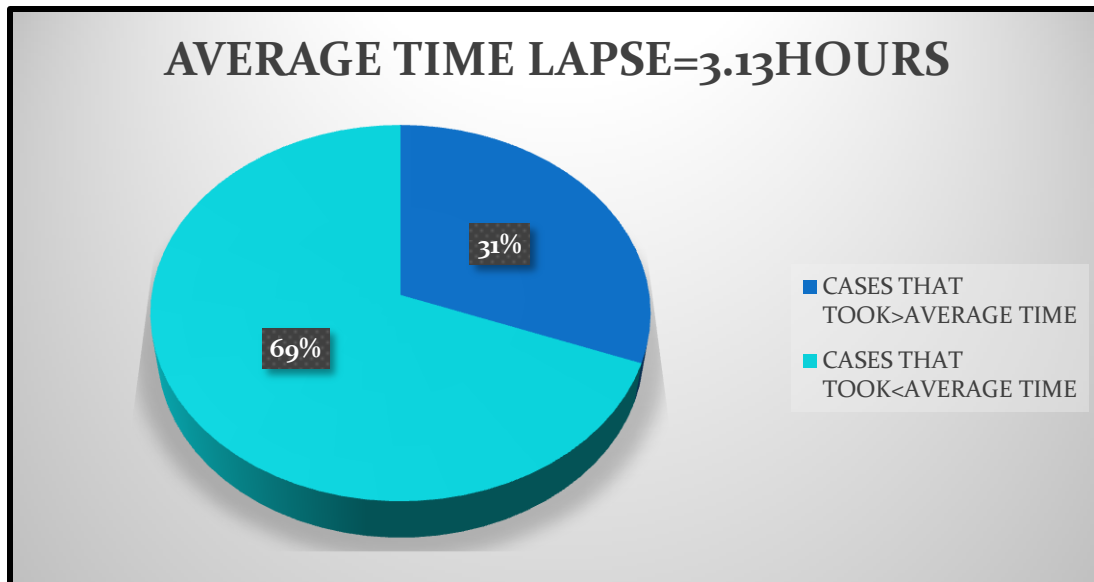
FIGURE 4.1: TIME LAPSE BETWEEN ORDER TIME AND THE INVESTIGATION.



N=13

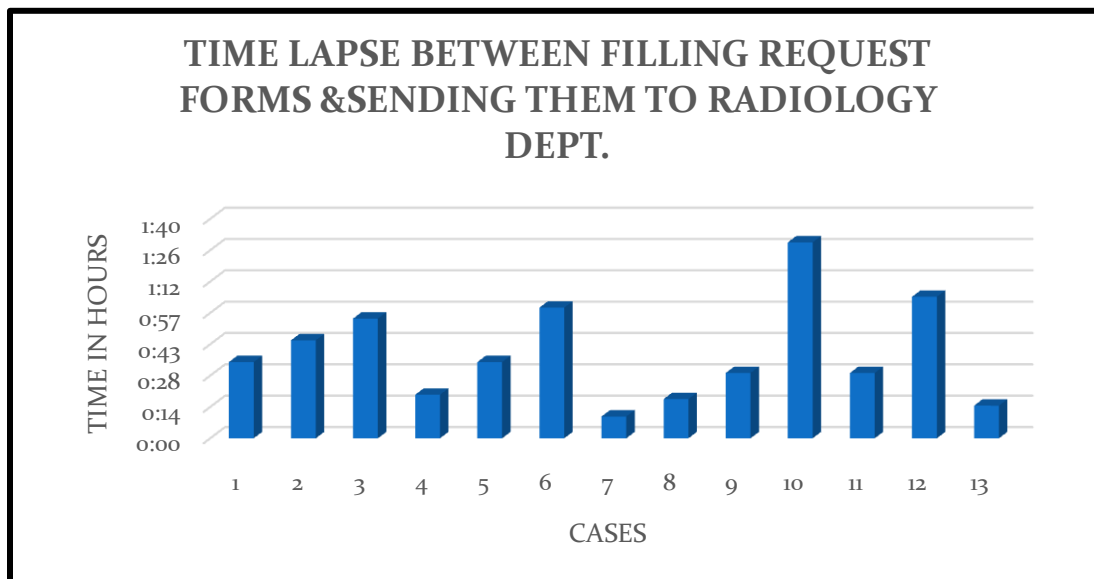
The **average time lapse was 3.13 hours** and the number of cases that showed a lapse more than this were 4.

FIGURE 4.2: NUMBER OF CASES THAT TOOK MORE TIME THAN THE AVERAGE TIME LAPSE



N=13

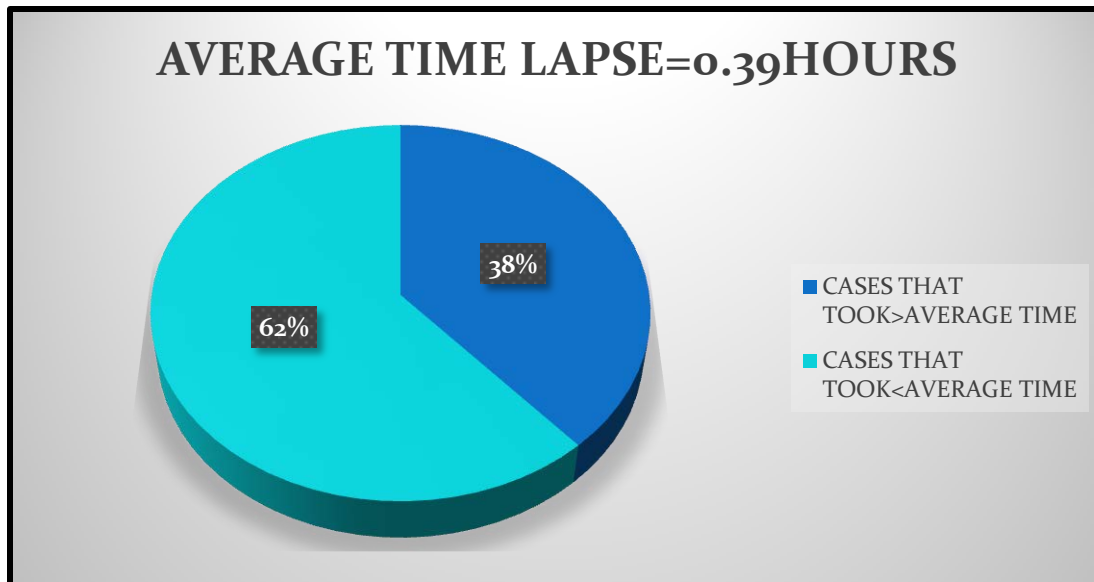
FIGURE 4.3: TIME LAPSE BETWEEN FILLING THE REQUEST FORMS AND SENDING THEM TO THE DEPT. OF RADIOLOGY



N=13

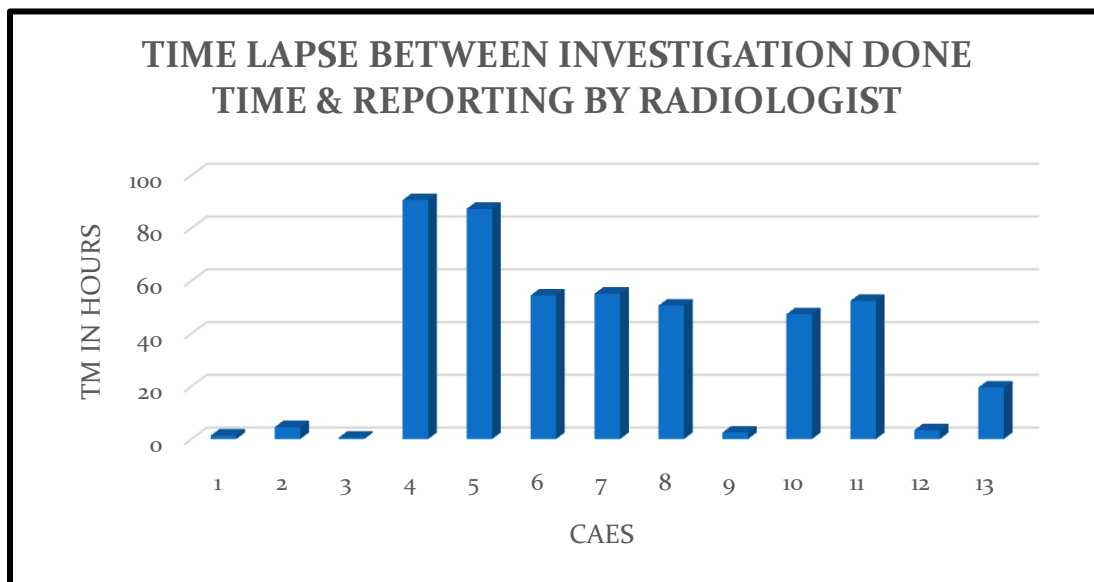
The **average time lapse was 0.39 hours** and the number of cases that showed a lapse more than this were 5.

FIGURE 4.4: NUMBER OF CASES THAT TOOK MORE TIME THAN THE AVERAGE TIME LAPSE



N=13

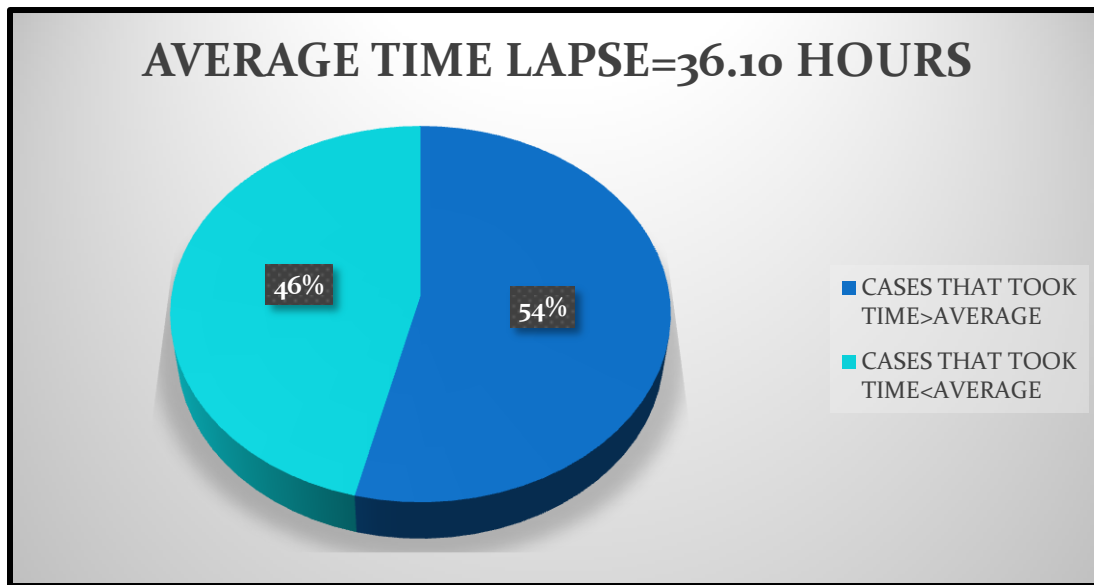
FIGURE 4.5: TIME LAPSE BETWEEN INVESTIGATION TIME & REPORTING BY RADIOLOGIST.



N=13

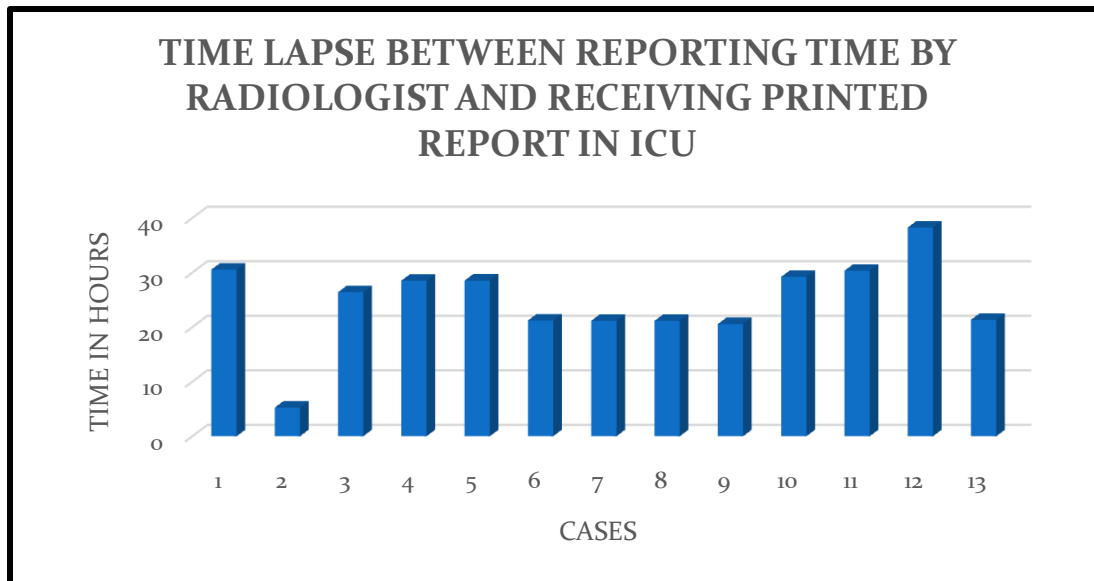
The **average time was 36.10 hours** and the cases that showed lapse more than this were 7.

FIGURE 4.6: NUMBER OF CASES THAT TOOK MORE TIME THAN THE AVERAGE TIME LAPSE



N=13

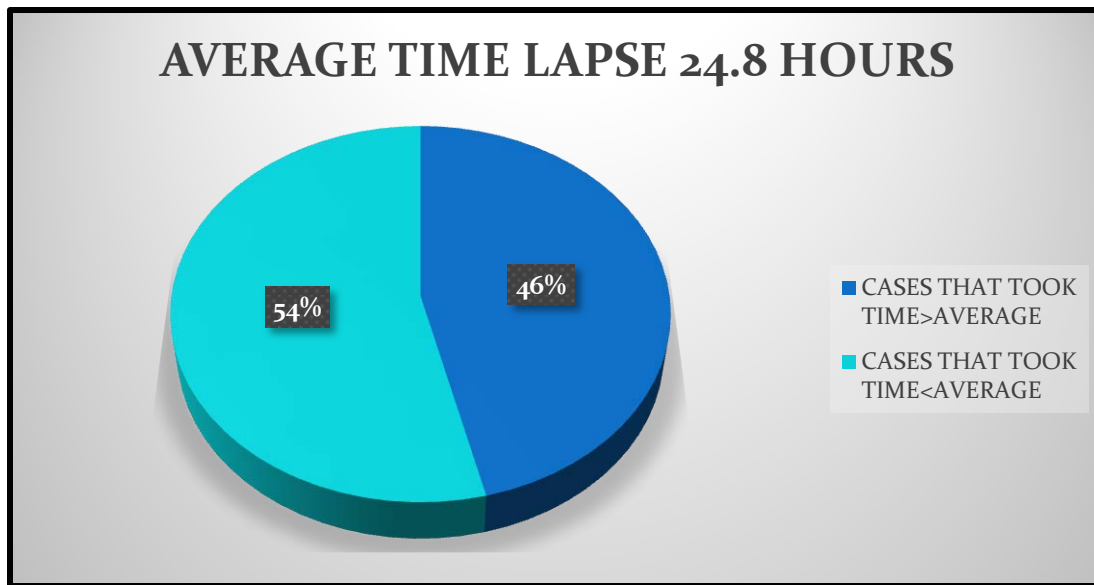
FIGURE 4.7: TIME LAPSE BETWEEN REPORTING BY RADIOLOGIST AND TIME AT WHICH REPORTS WERE RECEIVED IN THE ICU



N=13

The average time lapse was 24.8 hours and the number of cases that showed lapse more than this were 6.

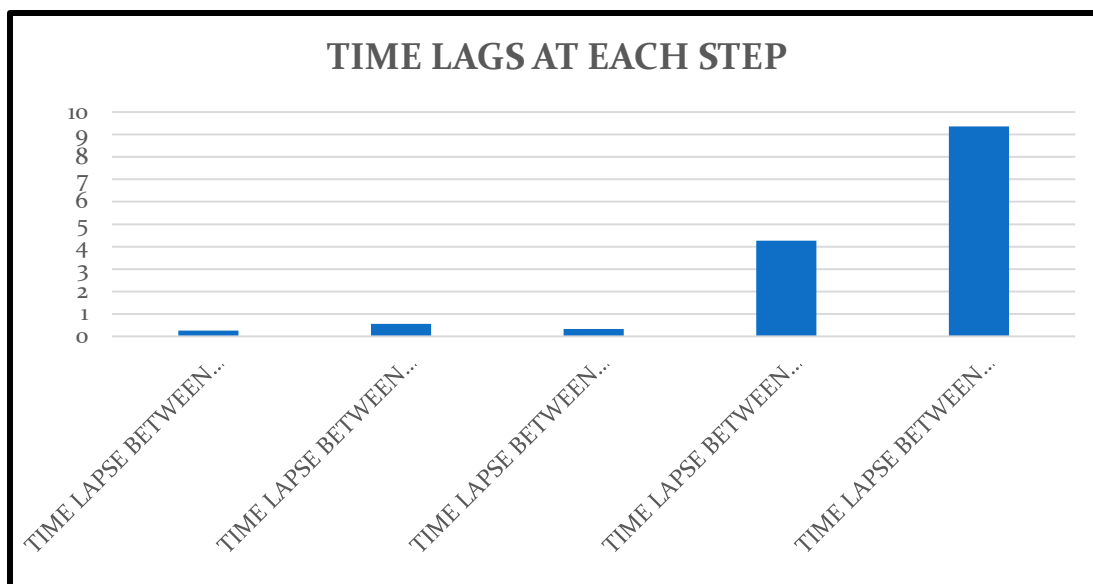
FIGURE 4.8: NUMBER OF CASES THAT TOOK MORE TIME THAN THE AVERAGE TIME LAPSE



N=13

- **Graphs were also plotted for all the time lapses between all the steps for each investigation to see which step took the maximum time**

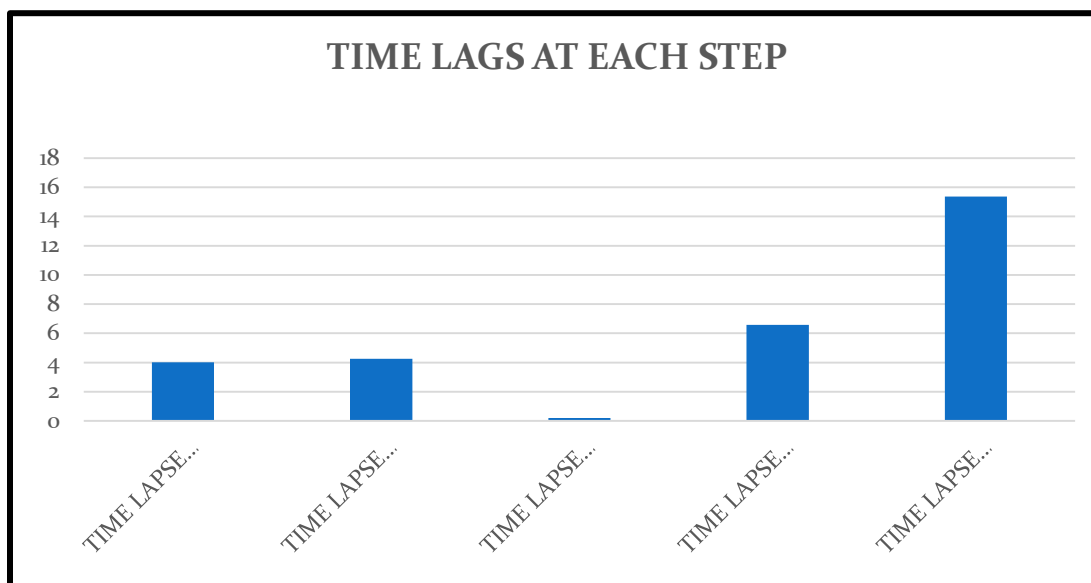
FIGURE 4.9: TIME LAG AT EACH STEP FOR PORTABLE X-RAYS ORDERED BETWEEN 8AM-6PM



N=36

Maximum time lag was observed in receiving the reports after the radiologist had reported. Time lapse between the time at which investigations were done and the radiologist reported was also found to be high.

FIGURE 5.0: TIME LAG AT EACH STEP FOR PORTABLE X-RAYS ORDERED AT NIGHT AND BEFORE 8AM IN THE MORNING



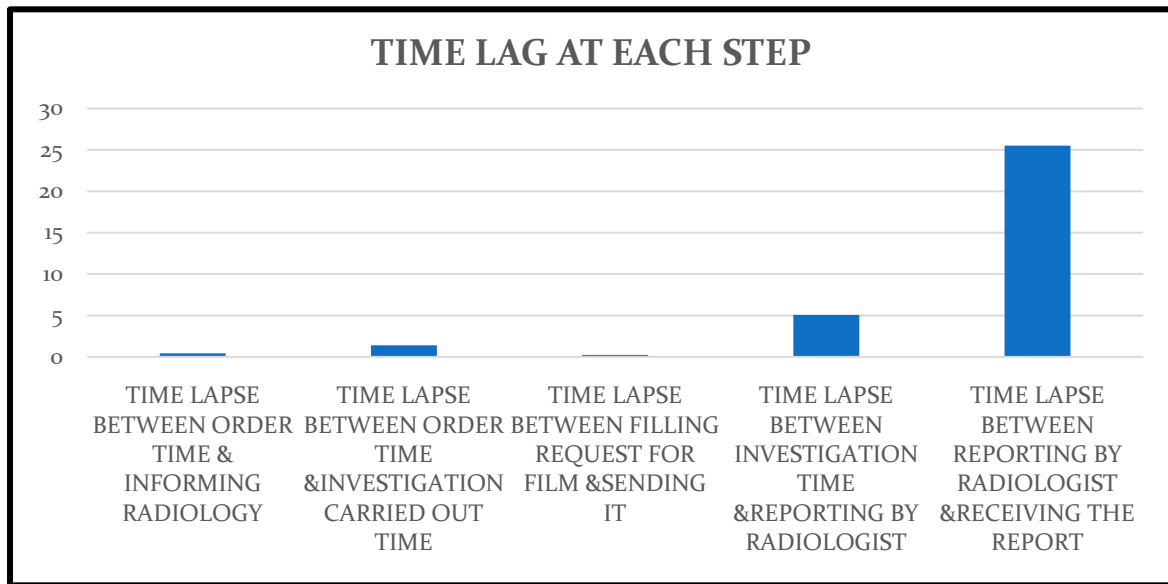
N=64

Maximum time lag was observed in receiving the reports after the radiologist had reported.

Significant time lag was also observed in the reporting of the investigations.

The time lag between order time & informing as well as taking the radiograph is also high because for these investigations the CR is raised at night but the call for informing as well as the investigations take place in the morning.

FIGURE 5.1: TIME LAG AT EACH STEP FOR CT/MRI INVESTIGATIONS

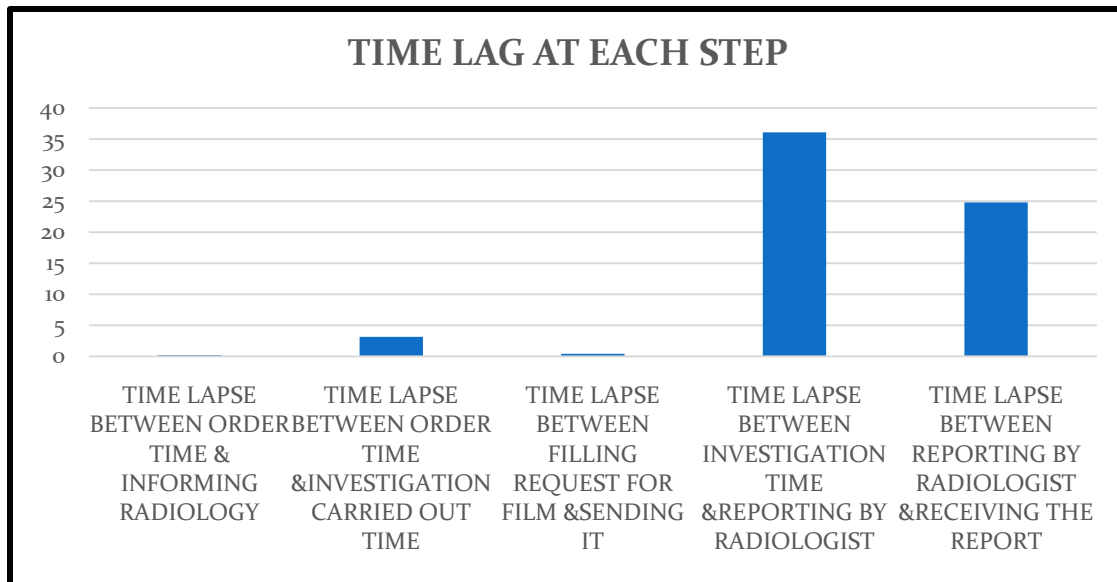


N=24

Maximum time lag was observed in receiving the reports after the radiologist had reported.

In these investigations time lag in taking the patient for investigation were observed because of the delay by the In Patient transport staff in coming to the ICU.

FIGURE 5.2: TIME LAG AT EACH STEP FOR USG INVESTIGATIONS



N=13

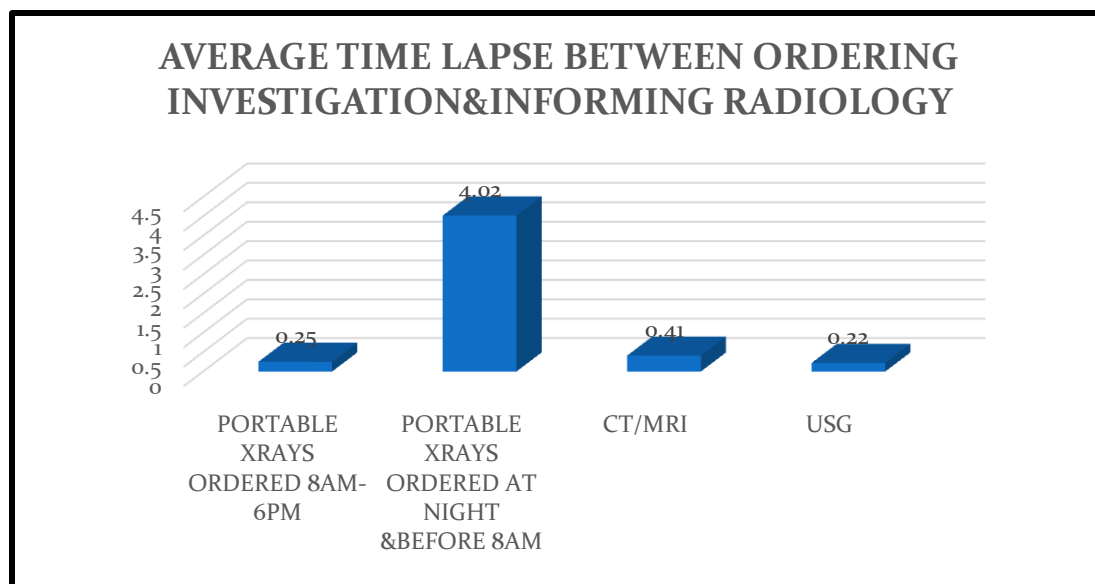
Here a significant lapse in the time for reporting after investigation was seen.

Time lapse between reporting & receiving reports is also high.

Another time lapse for these investigations is seen in between ordering the investigation & carrying it out.

The following graphs summarize the time taken at each step for all the investigations.

FIGURE 5.3 TIME LAPSE BETWEEN ORDER TIME & INFORMING THE RADIOLOGY DEPT FOR ALL INVESTIGATIONS



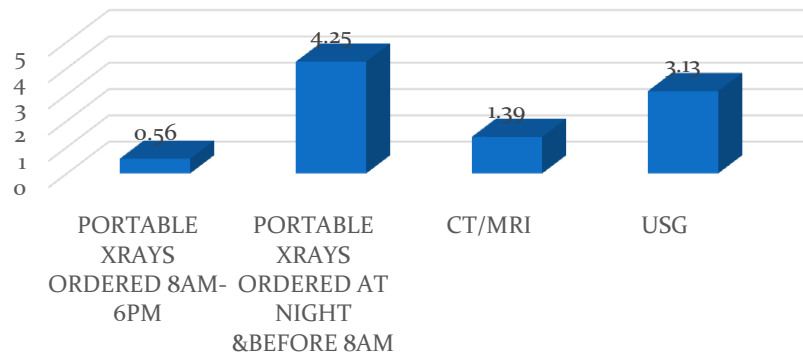
N=137

This time lapse was maximum for portable X-rays ordered at night and early morning followed by CT/MRI

It was high for portable x-rays ordered at night because the investigations are ordered at night and the information to the department of radiology goes in the morning.

FIGURE 5.4 TIME LAPSE BETWEEN ORDER TIME & THE INVESTIGATION/TAKING THE PATIENT FOR ALL INVESTIGATIONS

AVERAGE TIME LAPSE BETWEEN ORDER TIME & INVESTIGATION/TAKING PATIENT FOR INVESTIGATION

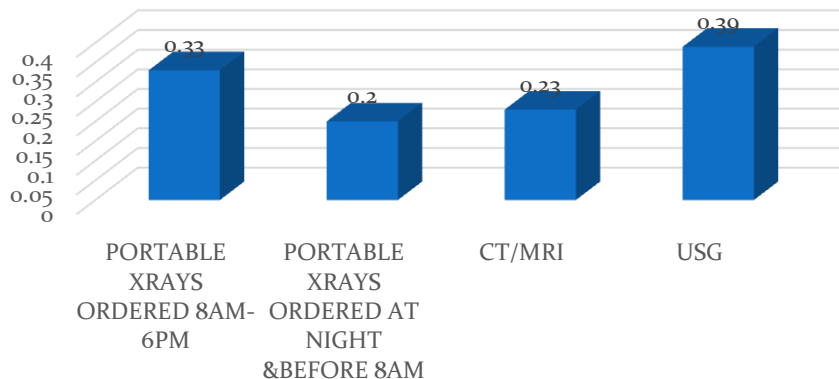


N=137

This time lapse was maximum for portable X-rays ordered at night and early morning followed by USG investigations.

FIGURE 5.5 TIME LAPSE BETWEEN FILLING REQUEST FORMS & SENDING THEM

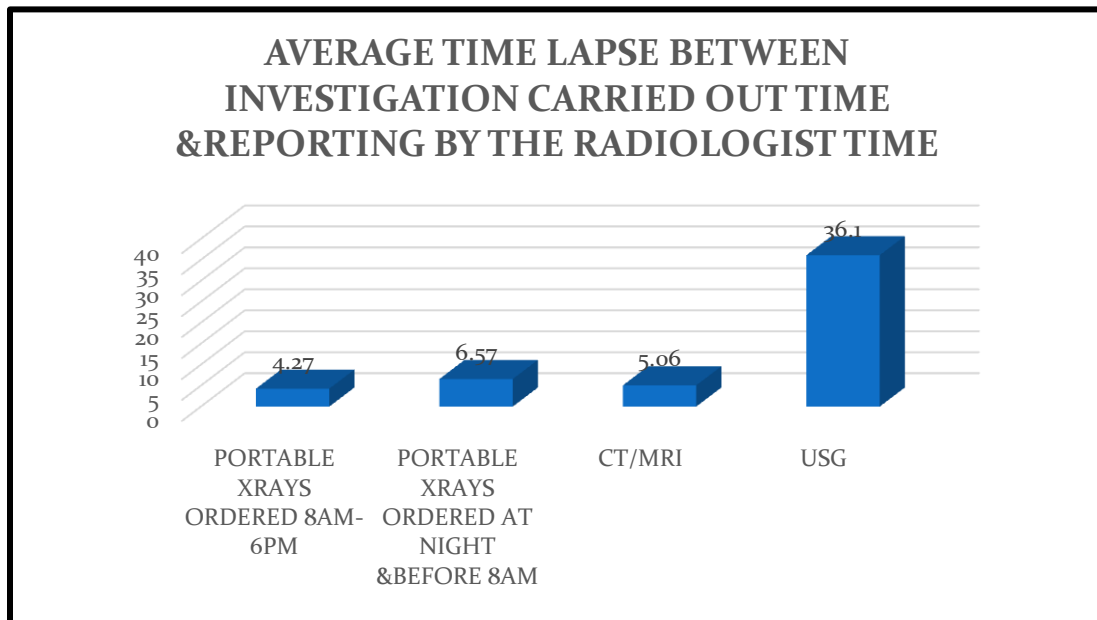
AVERAGE TIME LAPSE BETWEEN FILLING REQUEST FORM FOR FILMS&SENDING THEM TO RADIOLOGY



N=137

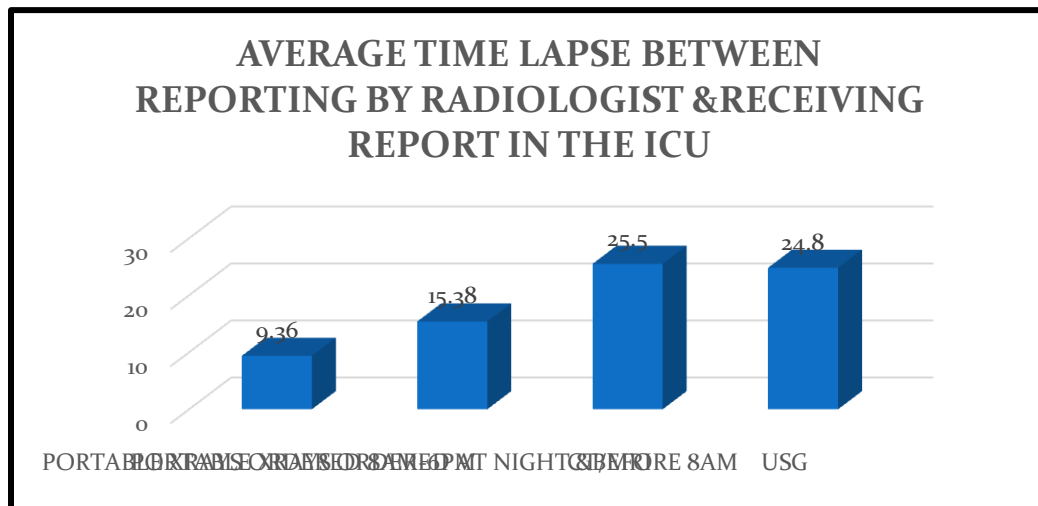
This is an issue present in all 4 types of cases with maximum in USG investigations.

FIGURE 5.6: TIME LAPSE BETWEEN INVESTIGATION TIME AND REPORTING BY RADIOLOGIST



This lapse was by far seen maximum in USG investigations.

FIGURE 5.7: AVERAGE TIME LAPSE BETWEEN REPORTING BY RADIOLOGIST & RECEIVING REPORT IN THE ICU



N=137

This lapse was seen in all types of cases with maximum in USG and CT/MRI investigations. The average time lapse extended to even more than a day in these investigations.

ANALYSIS

Certain delays were observed after doing the study on the process of radiology investigations ordered from the ICU. These are:

1. **There is a significant time lag between filling of the request form for films and sending them.** Due to presence of a very limited number of housekeeping staff, the delay in sending requests is mostly due to lack in their availability for going to the radiology department.
2. When the patient needs to be taken to the radiology department for CT/MRI, **a lot of time is lost in waiting for the IP transport staff.**
3. In case of USG investigations, **a significant time lag was observed between ordering the investigation and the time when it was carried out. The ICU does not have a separate portable USG machine.** A lot of time is spent in getting the machine from the Wellness Centre.
4. **The reports are not dispatched along with the film.** The reports of the investigations ordered in the morning are usually received at night, whereas for the investigations done during the later part of the day, the report arrives after 24 hours or more.
5. **No written record of the films and report received** is maintained in the ICU department.

RECOMMENDATIONS

ADMINISTRATIVE CHANGES

The number of housekeeping staff on duty per shift in SICU 1st floor are 2 (day shift) and 1 (evening and night shift). The number of housekeeping staff per duty in the 2nd floor SICU and MICU are 3-4 (common for both the units). Their work includes cleaning of the units, attending to patients and carrying requirements to/from Blood Bank/CSSD/Lab/Radiology dept. /Pharmacy.

The time table of the housekeeping staff should be made in a way that one staff should be available for attending to work requiring visit to other departments at all-time whereas the other(s) would be responsible for the work of the ICU.

The nursing staff should synchronize work requiring the housekeeping staff to leave the ICU in a way that enables them to complete multiple tasks together instead of being sent at short repeated intervals which leads to frequent absence from the ICU.

Timings should be fixed for collection of films and report from the radiology department (preferably at the end of each shift) when the housekeeping staff could go to collect all the films/reports (of investigations undertaken in that shift) that were left to be collected /sent from the radiology dept.

Coordination with the IP transport department to be done for sending staff for taking the patient to the radiology department at the earliest. Frequent delay from the part of IP transport dept. should be pointed out in the form of written complaint and the concerned manager should be informed.

INFRASTRUCTURE CHANGES

Currently, the portable USG machine is being shared by the ICU and the Wellness center which leads to delay in carrying out the USG investigations. There should be a separate machine common for all the units under the ICU.

The portable 2D echo machine that is present in the ICU can be used for USG investigations with the help of a convex probe. However, the 2D echo machine is not in a good condition and requires replacement. In case of non-feasibility of a separate portable USG machine, the 2D echo machine could be used when the former is not available.

SYSTEM CHANGES

A record should be maintained to keep a track of the films and reports received. After completion of each shift, the nursing staff on duty should do a follow up and enquire regarding the reports and film not received.

Provision for uploading the request for the film on the Picture Archives & Communication Software from the departments which would be addressed by the concerned staff in the dept. Of Radiology. This will remove the need to send housekeeping staff to the latter.

Provision for a scanner in the CCU to take scan of the request form and forward it to the Radiology dept. through the system could also address the need of making the process of sending request forms systematic instead of manual.

The PACS software currently has a provision of indicating the time of reporting of the investigations by the radiologists. It should also be updated to indicate the time of sending the reports to the respective departments. This would enable the staff of the dept. of Radiology and the concerned staff of the various departments to keep a track on cases where reporting has been done by the radiologist but has not been delivered.

The reports are uploaded in the PACS software. Printing the reports directly from this software in the ICU would ensure timely availability of the reports and decrease the need for sending the housekeeping staff to the radiology department.

LIMITATIONS OF THE STUDY

Due to time limitations, cases in which the order time was beyond 6pm were not included in the study. However, the investigations ordered at night time (beyond 11pm) were included in the study because they were carried out the next day in the morning and form the main bulk of the radiological investigations ordered in the ICU. Also, these investigations were carried out at the same time for all patients hence recalling the timings was not difficult for the nursing staff.

The researcher had to depend on informal interview of the nursing and housekeeping staff for timings beyond the operational observation time.

REFERENCES

1. www.ncbi.nlm.nih.gov/pubmed/4006492
2. www.hopkinsmedicine.org/
3. www.mainlinehealth.org
4. www.annalsofintensivecare.com

**ASSESSING THE AWARENESS OF BIO MEDICAL
WASTE MANAGEMENT AMONG THE STAFF OF
INTENSIVE CARE UNIT OF ADITYA BIRLA
MEMORIAL HOSPITAL, PUNE**

Project 2

INTRODUCTION

Biomedical waste management has recently emerged as an issue of major concern not only to hospitals, nursing home authorities but also to the environment. The bio-medical wastes generated from health care units depend upon a number of factors such as waste management methods, type of health care units, occupancy of healthcare units, specialization of healthcare units, ratio of reusable items in use, availability of infrastructure and resources etc.

This study was undertaken to assess the knowledge and awareness regarding the Bio Medical Waste Management among the staff of the Intensive Care Unit of ABMH, Pune. The junior doctors, nurses and housekeeping staff were included in the study and the data was collected with the help of a questionnaire.

The questionnaire addressed three aspects namely the knowledge regarding Bio medical waste management, the practices followed and the attitude towards it.

The collected data was then evaluated to identify presence of any problem areas and give solutions for the same.

LIST OF CHARTS

Chart no.	Chart title
	A) Scores of section A
1.1	Average score for doctors
1.2	Average score for nurses
1.3	Work experience of less than average scorers
1.4	Average score for housekeeping staff
1.5	Work experience of less than average scorers
	B) Scores of Section B
1.6	Average score for doctors
1.7	Average score for nurses
1.8	Work experience of less than average scorers
1.9	Average score for housekeeping staff
2.0	Work experience of less than average scorers
2.1	Significance of Bio Medical Waste management among staff
2.2	Work experience of those who considered it insignificant
2.3	Adequacy of knowledge among staff
2.4	Work experience of those with inadequate knowledge
2.5	Should hospital conduct programs on Bio medical waste management
2.6-2.8	Willingness to attend these programs

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Operational definition	7
Objectives	8
Rationale	9
Review of literature	10
Research Methodology	14
Observations	15
Analysis	27
Recommendations	29
Annexures: questionnaire	31
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RESEARCH PROBLEM

Is the knowledge and awareness regarding Bio Medical Waste Management adequate among the staff of the Intensive Care Unit?

OPERATIONAL DEFINITION

For the study purpose, the average score in each section has been considered to be the minimum desired score. Individuals with a score equal to and above average have been considered to have an adequate knowledge and awareness in each section.

OBJECTIVES

To assess the knowledge and awareness regarding Bio medical waste management among the staff of the Intensive Care Unit of Aditya Birla Memorial Hospital, Pune

To identify the key areas for improvement in the awareness and give recommendations for the same.

RATIONALE

Improper management of Bio medical waste poses risk to patients, hospital staff and the public.

Risk to healthcare workers and waste handlers

Improperly contained contaminated sharps pose greatest infectious risk associated with hospital waste. There is also theoretical health risk to medical waste handlers from pathogens that may be aerosolized during the compacting, grinding or shredding process that is associated with certain medical waste management or treatment practices. Physical (injury) and health hazards are also associated with the high operating temperatures of incinerators and steam sterilizers and with toxic gases vented into the atmosphere after waste treatment.

Risk to the public

Public impacts are confined to esthetic degradation of the environment from careless disposal and the environmental impact of improperly operated incinerators or other medical waste treatment equipment.

Risk to patients

There may be increased risk of nosocomial infections in patients due to poor waste management. Improper waste management can lead to change in microbial ecology and spread of antibiotic resistance. [3]

It is therefore essential for the hospital staff to be well adept in management of such waste. This study would help to assess if the knowledge among the staff is adequate and if not, identify the key areas of improvement for the same.

REVIEW OF LITERATURE

Bio-medical waste is defined as waste that is generated during the diagnosis, treatment or immunization of human beings or animals, or in research activities pertaining thereto, or in the production or testing of biological products.

The different location or points of waste generation are:

Operation theaters/wards/labor room/OPD

- Dressing rooms
- Injection rooms
- Intensive Care Units, ITU, CCU
- Dialysis room
- Laboratory
- Corridor
- Compound of hospital or nursing home

Biomedical waste differs from other types of **hazardous waste**, such as **industrial waste**, in that it comes from biological sources or is used in the diagnosis, prevention, or treatment of diseases. Common producers of biomedical waste include **hospitals, health clinics, nursing homes, medical research laboratories**, offices of **physicians, dentists**, and **veterinarians, home health care**, and **funeral homes**.



Biomedical waste consists of solids, liquids, sharps and laboratory waste that are potentially infectious or dangerous. It must be properly managed to protect the general public, specifically healthcare and sanitation workers who are regularly exposed to biomedical waste as an occupational hazard.

The following is a list of materials that are generally considered biomedical waste:

SOLIDS

- Catheters and tubes
- Disposable **gowns**, **masks**, and **scrubs**
- Disposable tools, such as some **scalpels** and surgical staplers
- Medical gloves
- **Surgical sutures** and **staples**
- Wound dressings

LIQUIDS

- **Blood**
- Body fluids and tissues
- **Cell**, **organ**, and **tissue** cultures

SHARPS

- Blades, such as **razor** or **scalpel** blades
- Lancets
- Materials made of glass, such as **cuvettes** and **slides**
- Metal **stylets**
- Needles
- Plastic **pipettes** and tips
- **Syringes**

LABORATORY WASTE

- Animal carcasses
- Hazardous chemicals with biological components
- Media
- Medicinal plants
- Radioactive material with biological components
- Supernatants

The Bio-Medical Rules have recommended different color codes for waste containers in which different types of wastes need to be stored. Clinical and general wastes should be segregated at source and placed in color coded plastic bags and containers of definite specifications prior to collection and disposal.

The container should comprise of an inner plastic bag of varied color depending on the type of waste. It should be of a minimum gauge of 55 micron (if of low density) or 25 micron (if of high density), leak-proof and puncture proof, and should match the chosen outer container. The outer container is a plastic bin with handles, and of a size which will depend on the amount of waste generated. The inner polythene bag should fit into the container with one-fourth of the polythene bag turned over the rim. Labeling has been recommended to indicate the type of waste, site of generation, name of generating hospital or facility. This will allow the waste to be traced from the point of generation to the disposal area.

The containers are then to be transported in closed trolleys or wheeled containers which should be designed for easy cleaning and draining. Categories and color coding recommended for segregation in health-care establishment, including the categories mentioned in the Bio-Medical Waste Regulations of the Ministry of Environment and Forests, Government of India. [1]

Category	Type of Waste	Container	Color
Cat. 1	Human Anatomical Waste, blood and body fluids, bandages, animal and slaughter house waste, microbiology and biotechnology waste, extremely soiled linen	Tubs, buckets with lids	YELLOW
Cat. 2	Sharps - Two types Reusable sharps such as some needles, scalpels, surgical instruments separated by needle/sharp separator Waste sharps such as broken glass, disposable needles, blades etc.	Veterinary institutions, dispensaries and animal houses Cardboard carton	WHITE or TRANSLUCENT BLUE
Cat. 3	Disposable plastics, rubber/latex gloves	Bags or buckets, stainless steel drums	RED
Cat. 4	Chemical wastes, all hazardous wastes	Bucket with lid, cardboard container	BLACK
Cat. 5	Compostable waste	Buckets/drums/ trolley	GREEN



METHODOLOGY

STUDY POPULATION-Junior doctors, nurses and housekeeping staff of the 4 units of the Intensive Care Unit

STUDY TYPE-Cross-sectional study

SAMPLING TECHNIQUE-Simple Random Sampling

SAMPLE SIZE -45

DATA COLLECTION TOOL-Questionnaire

- The questionnaire prepared had a total of 15 questions.
- It was divided into 3 sections namely sections A, B and C. Under each section, there were 5 questions.
- The questions of Section A aimed to check the knowledge regarding Bio medical waste
- Section B was designed such that the questions assessed the prevalent practice of handling bio medical waste among the staff.
- The questions of section C were to assess the attitude of the staff towards management of bio medical waste.
- The questionnaire also took information regarding position namely doctor, nurse or housekeeping as well as work experience; less than 1 year or more than 1 year.

The questions were objective type and simple to understand. It was ensured that the subjects were at ease while filling them and did not discuss the answers with colleagues.

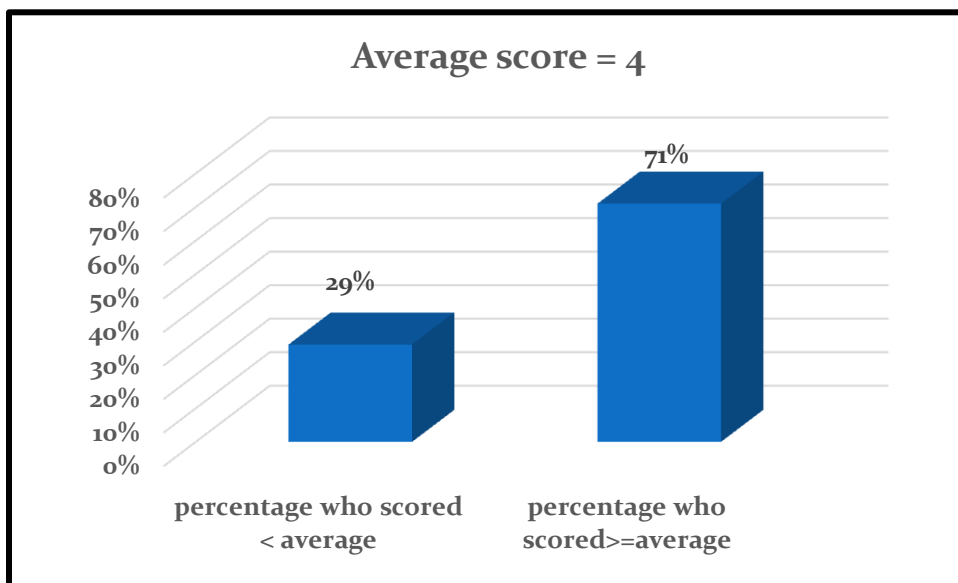
The doctors and the nurses were handed the questionnaires to be filled. The housekeeping staff were read out the questions in Hindi by the researcher.

OBSERVATIONS

Section A-Assessing knowledge

➤ DOCTORS

Figure 1.1 AVERAGE SCORE FOR DOCTORS IN SECTION A



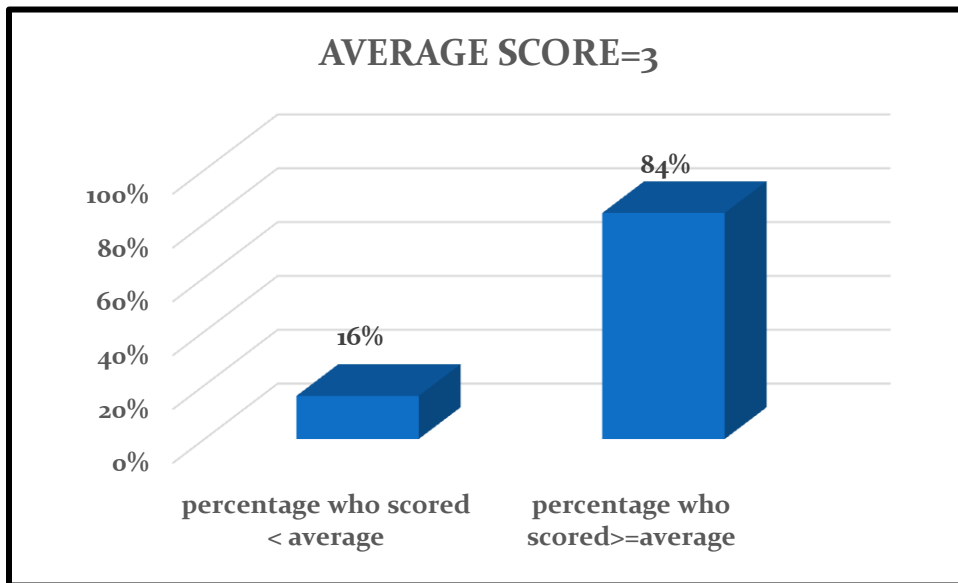
N=7

The group average score among doctors was 4. 71% doctors score 4 and above in the first section

The 29% doctors who scored less than average had been working in ABMH for less than 1 year

➤ **NURSES**

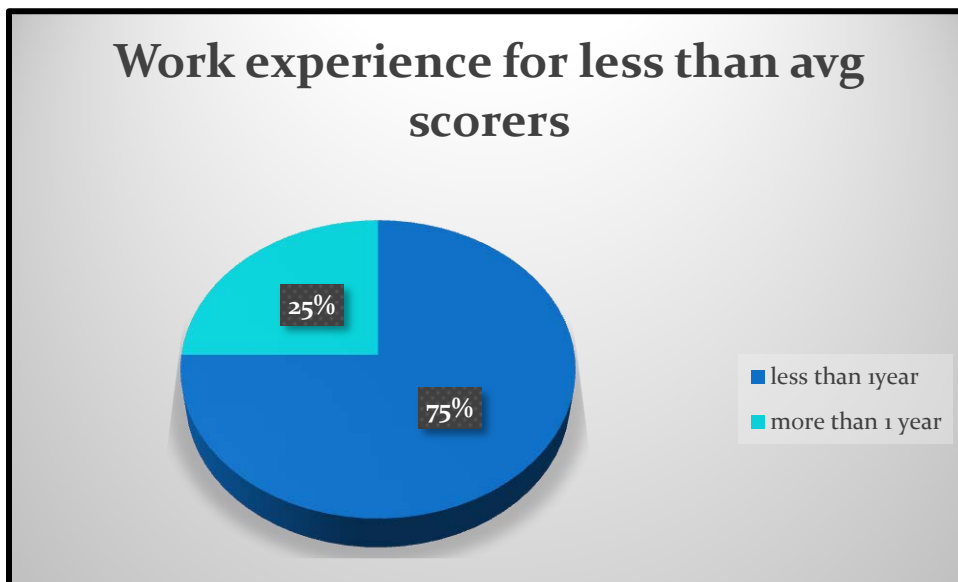
FIGURE 1.2 AVERAGE SCORE FOR NURSES IN SECTION A



N=25

The average score among nurses was 3 and 84% nurses scored 3 or more. Among the 16% nurses who scored less than average, 75% had less than 1 year of work experience

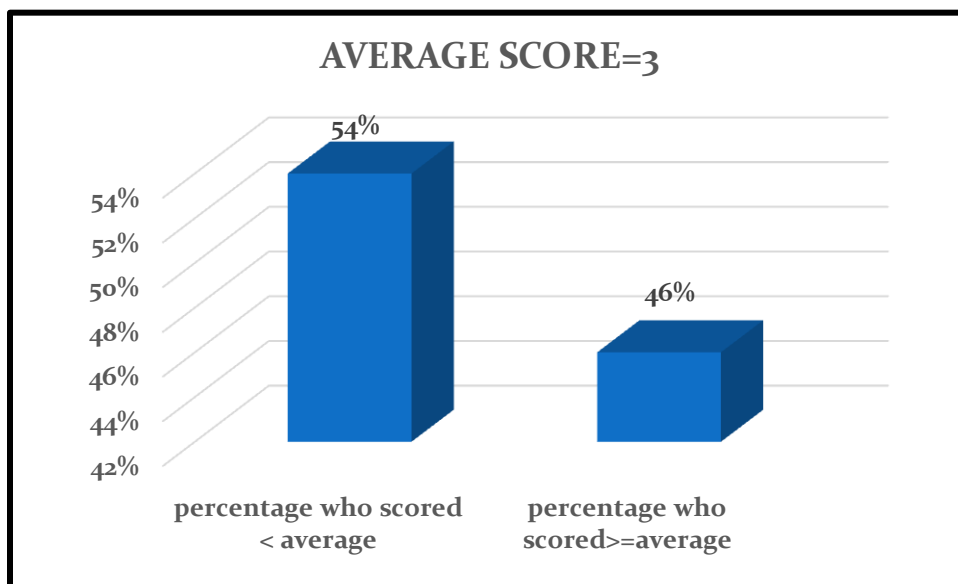
FIGURE 1.3 WORK EXPERIENCE OF LESS THAN AVERAGE SCORERS



N=25

➤ **HOUSEKEEPING**

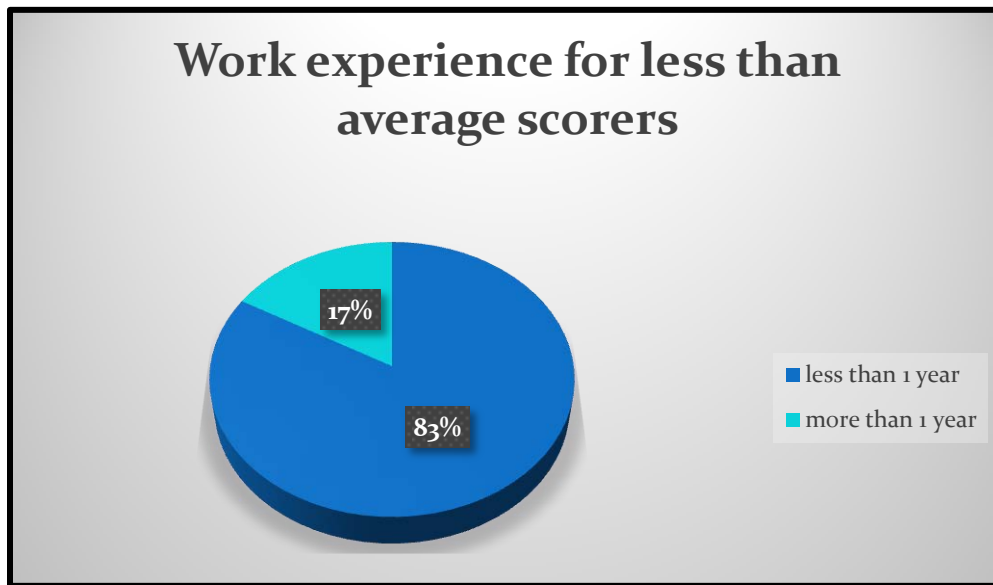
FIGURE 1.4 AVERAGE SCORE OF HOUSEKEEPING STAFF IN SECTION A



N=13

The average score among the housekeeping staff was 3 and 46% scored 3 and above. Among the 54 % who scored less, 83% had less than 1 year of work experience.

FIGURE 1.5 WORK EXPERIENCE FOR LESS THAN AVERAGE SCORERS

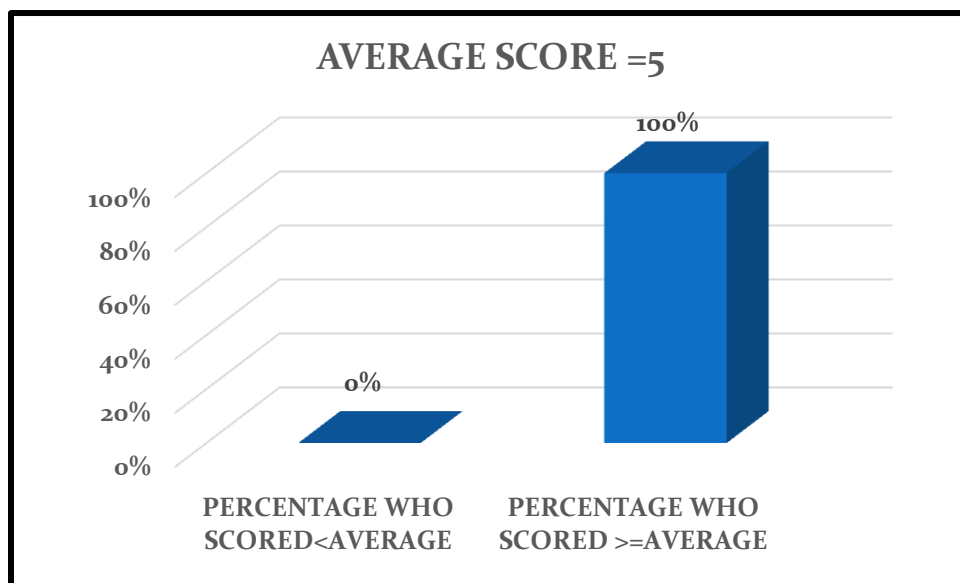


N=13

SECTION B-ASSESSING PRACTICES

➤ DOCTORS

FIGURE 1.6 AVERAGE SCORE OF DOCTORS IN SECTION B

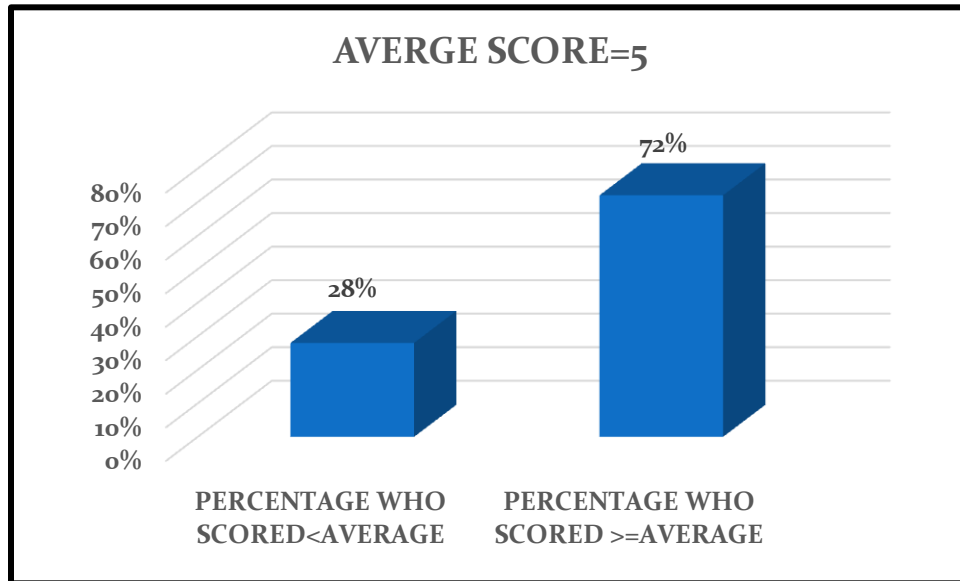


N=7

All the doctors under study scored 5 out of 5 in this section

➤ NURSES

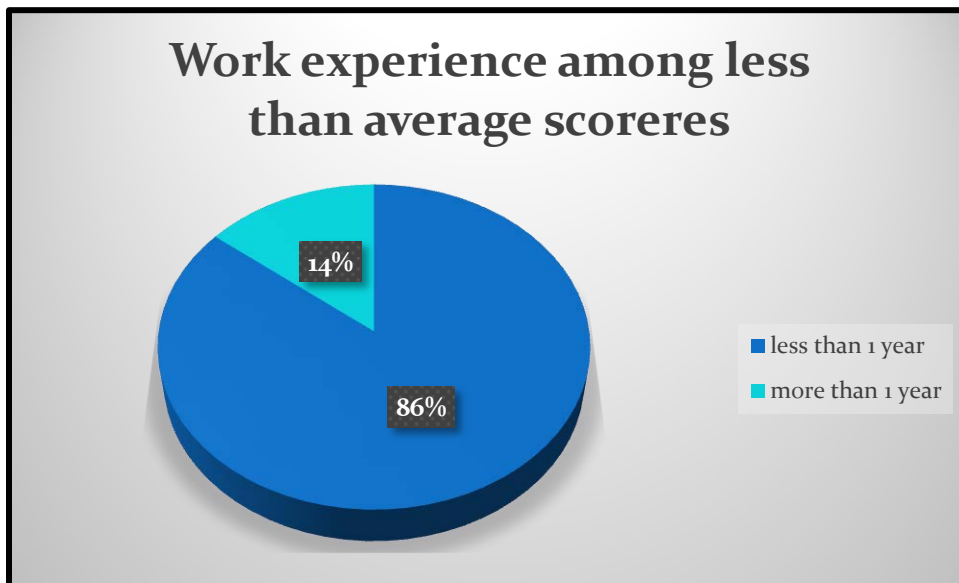
FIGURE 1.7 AVERAGE SCORE OF NURSES IN SECTION B



N=25

The average score for nurses in this section was 5 out of 5. 72% nurses scored 5 whereas 28% scored less. Out of these 28%, 86% of the nurses had less than 1 year of work experience.

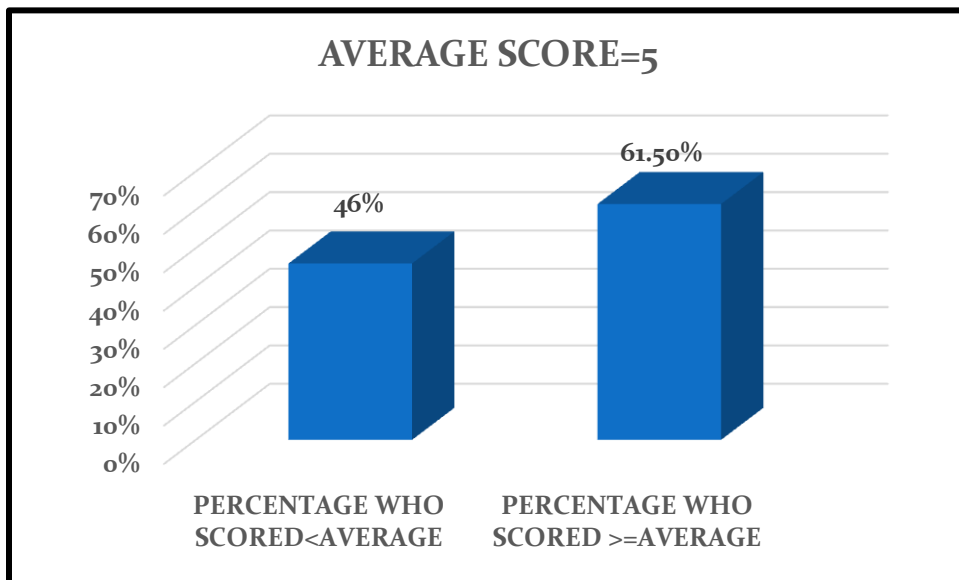
FIGURE 1.8 WORK EXPERIENCE OF LESS THAN AVERAGE SCORERS



N=25

➤ HOUSEKEEPING

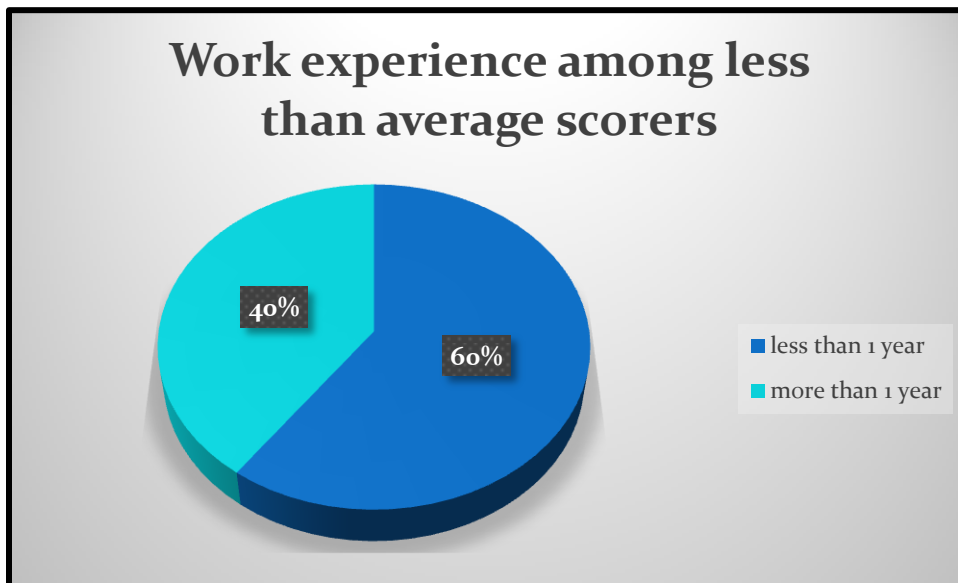
FIGURE 1.9 AVERAGE SCORE OF HOUSEKEEPING STAFF IN SECTION B



N=13

The average score was 5 and 61.5 % staff scored it
 Out of the 46 % who scored less, 60% have work experience of less than 1 year.

FIGURE 2.0 WORK EXPERIENCE OF LESS THAN AVERAGE SCORERS

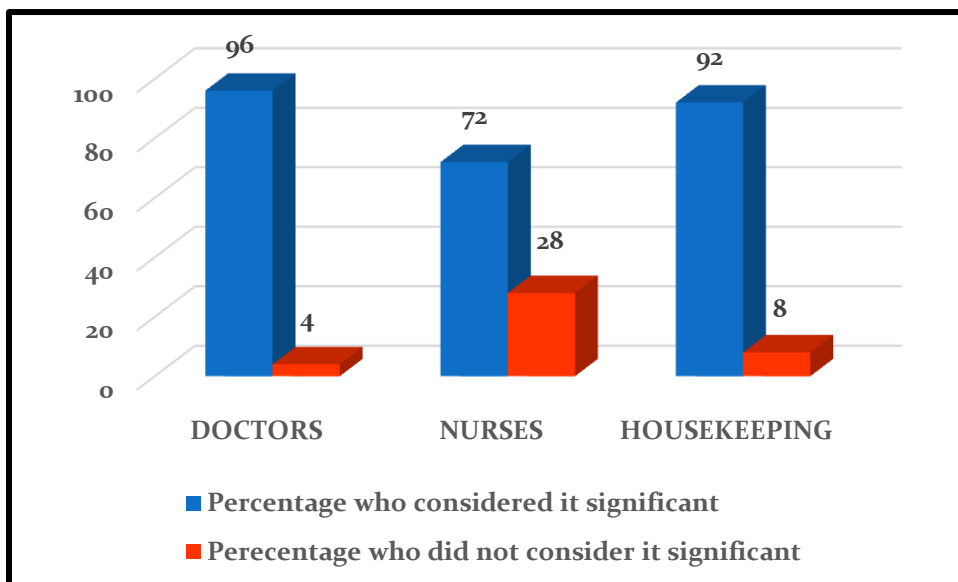


N=13

SECTION C-ASSESSING ATTITUDE

The first two questions in this section assessed the individual's perception on the importance of waste management in the hospital.

FIGURE 2.1 SIGNIFICANCE OF BIOMEDICAL WASTE MANAGEMENT AMONG STAFF

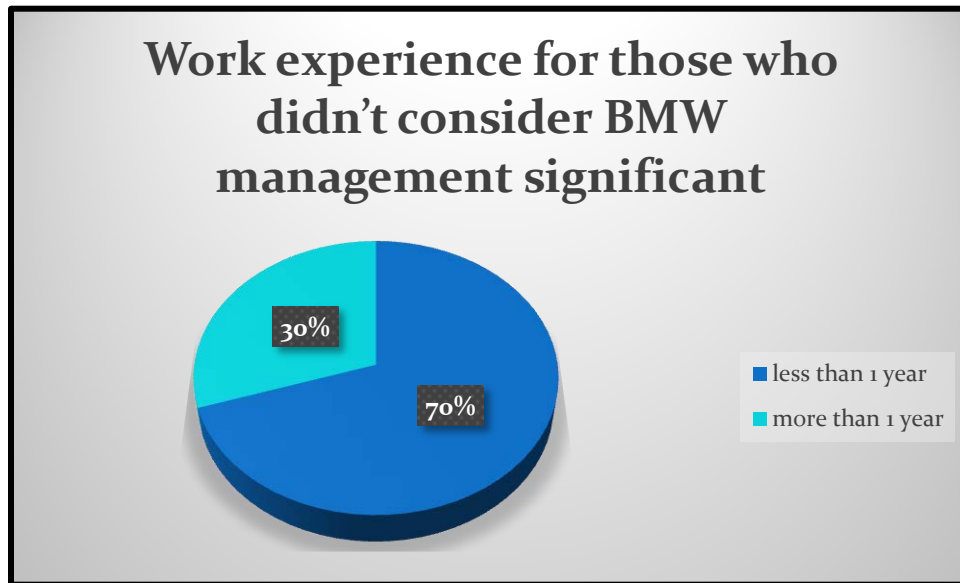


N=45

96% of doctors, 72% of nurses and 92 % of housekeeping staff believed that Bio Medical waste management are of high significance in hospitals.

Out of those who did not consider it significant, 70% had been working for less than 1 year.

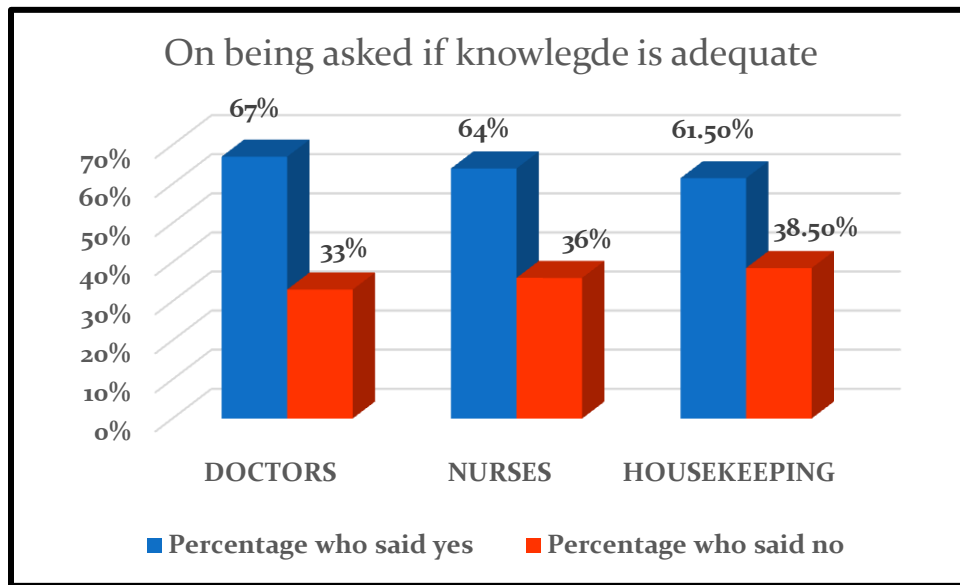
FIGURE 2.2 WORK EXPERIENCE OF THOSE WHO DON'T CONSIDER BMW MANAGEMENT SIGNIFICANT



N=45

The next three questions assessed the perception of the individuals about the adequacy of their knowledge, their attitude towards knowledge up-gradation programs on BMW management as well as their willingness to attend these.

FIGURE 2.3 ADEQUACY OF KNOWLEDGE ON BMW MANAGEMENT

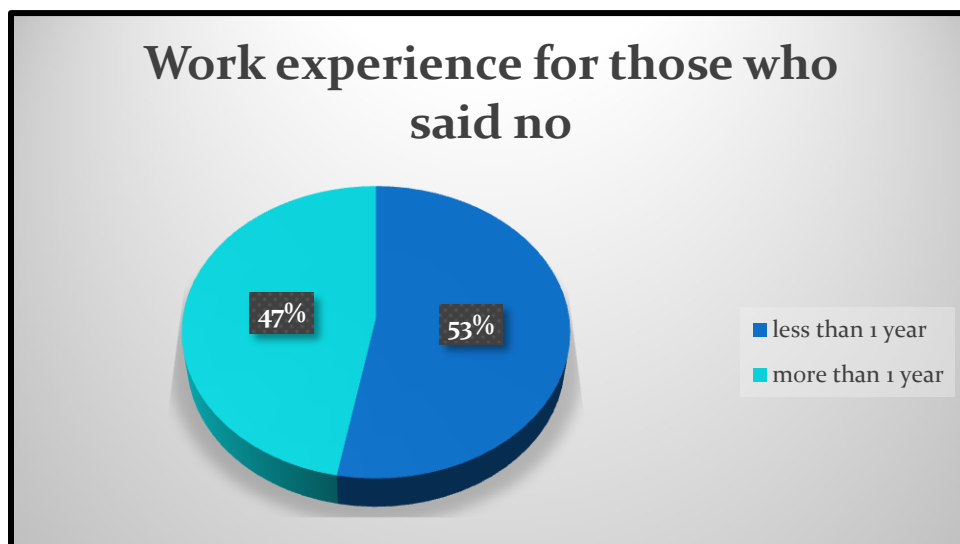


N=45

67% of doctors, 64% of nurses and 61.5 % housekeeping staff felt that their knowledge regarding Bio Medical waste management is adequate.

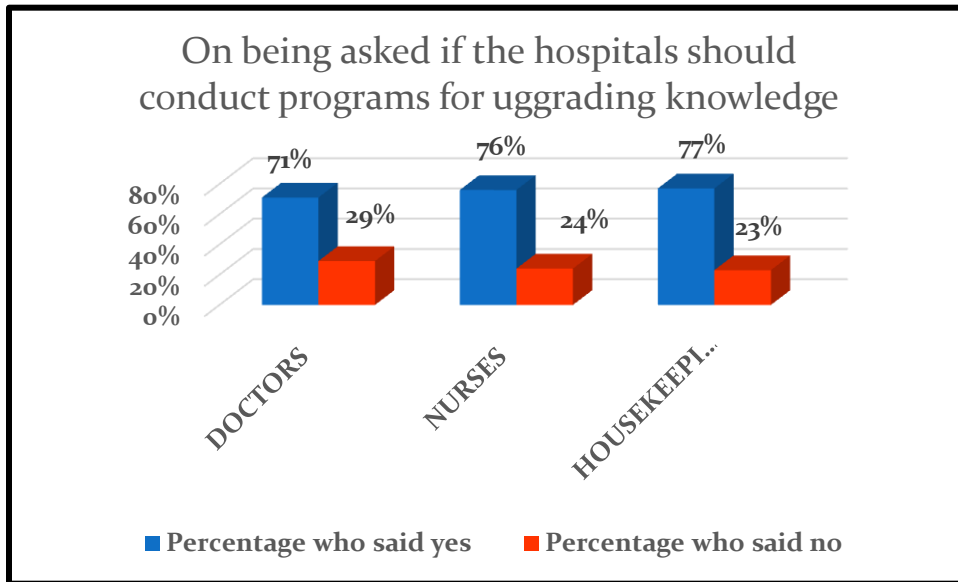
Among those who did not believe so 53% had been work experience of less than one year and 47% had more than 1 year of experience.

FIGURE 2.4 WORK EXPERIENCE FOR THOSE WHO CONSIDER KNOWLEDGE TO BE INADEQUATE



N=45

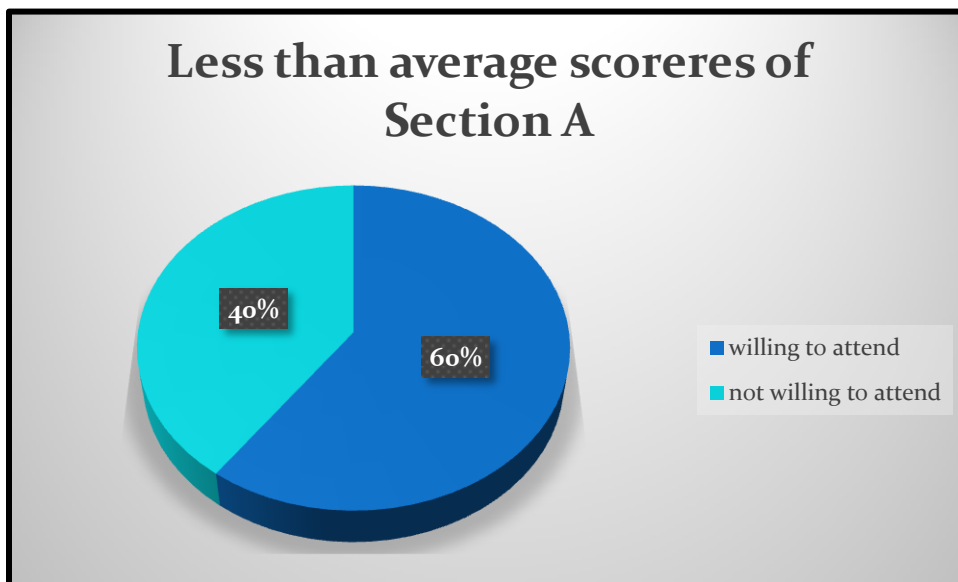
FIGURE 2.5 OPINION ON WHETHER HOSPITAL SHOULD CONDUCT PROGRAMS FOR UPDATING KNOWLEDGE



N=45

71% of doctors, 76% of nurses and 77% of housekeeping staff felt that programs on BMW management should be conducted by the hospital.

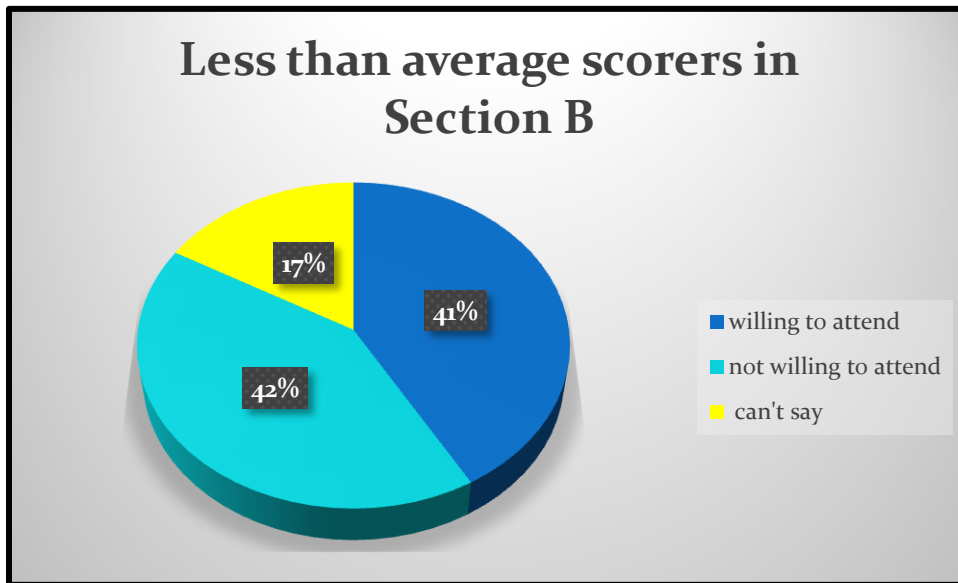
FIGURE 2.6 WILLINGNESS TO ATTEND PROGRAMMES AMONG LOW SCORERS OF SCETION A



N=45

Among those who scored less than average scores in Section A ,60% agreed to attend programs for updating knowledge on waste management if conducted by hospitals, whereas 40% said no

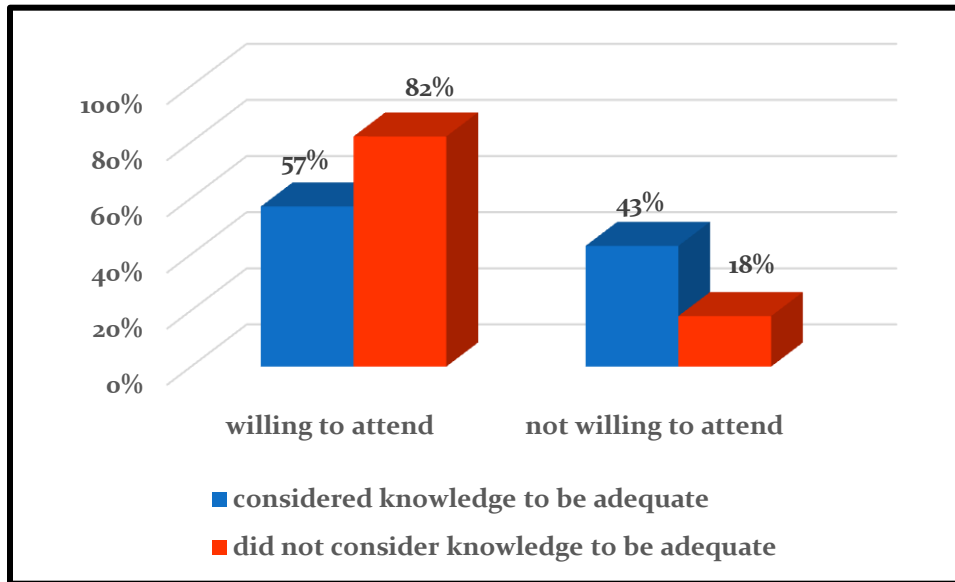
FIGURE 2.7 WILLINGNESS TO ATTEND PROGRAMS IN LOW SCORERS OF SECTION B



N=45

Among those who scored less than average in Section B, 42% were not willing to attend such programs,41% were willing whereas 17% were not sure.

FIGURE 2.8 WILLINGNESS TO ATTEND PROGRAMS ON BMW MANAGEMENT AMONG THE STAFF



N=45

Among those who felt their knowledge was adequate, 57% were still willing to attend programs if conducted. Among those who felt their knowledge was not adequate, 82% were willing.

ANALYSIS

Knowledge

Majority of doctors and nurses were found to have adequate knowledge regarding Bio medical waste management.

Among the housekeeping staff, more than half of the study sample (54%) were found to have inadequate knowledge.

Among those who scored less, the majority had work experience of less than one year.

Practices

The average score under this section was five (out of five) for all 3 categories; doctors, nurses and housekeeping. This shows that the BMW management practices are good in the Intensive Care Unit.

100 % doctors were correct regarding awareness on correct practices of BMW management but the scores were lesser among nurses (72%) and housekeeping staff (61.5%)

In this case too, majority of the less than average scorers had working experience of less than one year.

Attitude

Majority of the staff believed that BMW management is significant for the hospital and that the hospital should conduct programs for updating knowledge in this aspect.

Only 67 % of doctors, 64% of nurses and 61.5% of housekeeping staff felt that their knowledge on BMW management is adequate.

Among those who felt that their knowledge is not adequate, majority were willing to attend programs for updating their knowledge.

Major proportion of those who scored less than average in knowledge and awareness sections was not willing to attend these programs if conducted. This shows lack of motivation among towards updating and enhancing knowledge regarding waste management.

In this section too, the lack of positive attitude towards Bio medical waste management was more evident among those with work experience less than 1 year.

RECOMMENDATIONS

Enhancing knowledge

The manuals on Bio medical waste management guidelines though present in the department, are often not read by the staff especially the housekeeping personnel.

Posters/printed pamphlets explaining the basics of Bio medical waste management can be put up on walls. They can be put up in rooms where the staff usually gather when they break for tea.

These should be containing information in both English and Hindi/local language and should contain more of pictorial information so that it is easy to understand and implement by everyone.

Booklets on guidelines and protocols on BMW management can be kept in the Beverage room. The staff on a regular basis assembles here and is comparatively at ease at the time of tea/coffee breaks. This time might be utilized by some to go through these booklets by some. However, these booklets must be more pictorial and avoid information overload for ease of reading.

Ensuring correct practices

The BMW management practices were found to be good in the department. There should be surprise visits conducted by the senior management staff or personnel of the Dept. of Biomedical waste Management to ensure that the practices are strictly followed.

It was found that compared to doctors and nurses, the majority of housekeeping staff who scored well in awareness of correct practices were comparatively lower. The senior most housekeeping staff in the unit should be made responsible for supervising correct practices among the other housekeeping staff. The added responsibility would keep them motivated as well as ensure right practices being followed

Ensuring continuous learning and enhancement of knowledge.

The hospital should conduct programs/workshops/seminars at regular intervals, preferably every 6-12 months for the employees where and knowledge enforcement and up gradation in key areas should be done. Bio medical waste management should be taken up as one of these key areas. Attending these should be mandatory for staff.

Small questionnaires should be distributed among staff once a year for self-assessment of knowledge. This would help in gauging any improvement as well as understanding the need to updating knowledge.

More emphasis on Bio Medical Waste Management to be laid in the induction & orientation of new recruits

It was observed that the lack of adequate knowledge and awareness was mostly observed in the staff with less than one year of experience. The current induction program gives one day to Bio Medical Waste Management practices (among 10 day program for nurses and 3 day program for housekeeping)

More thorough training should be provided especially for the housekeeping staff. New recruits should be continuously supervised by seniors.

QUESTIONNAIRE

A STUDY TO ASSESS AWARENESS ON BIO-MEDICAL WASTE MANAGEMENT AMONG THE STAFF OF INTENSIVE CARE UNIT OF ADITY BIRLA MEMORIAL HOSPITAL, PUNE

Your position ☐ Doctor ☐ Nurse ☐ Housekeeping staff

Working experience: ☐ less than 1 year ☐ more than one year

Section A

- 1) According to you, which among these best explains the term Bio- Medical waste
- ☐ Waste that do not pose a disease related risk
 - ☐ Solids, liquids, sharps and laboratory waste that are potentially infectious or dangerous.
 - ☐ Poisonous or toxic materials that do not pose disease related risk.
 - ☐ Can't say
- 2) Can any plastic bag be used for waste disposal in the department?
- ☐ Yes ☐ no ☐ don't know
- 3) Have you had any training in Bio Medical Waste Management?
- ☐ Yes ☐ no
- 4) According to national guidelines on Bio Medical Waste Management, what is the maximum time limit for which Bio Medical waste can be stored?
- ☐ 24 hrs. ☐ 48hrs ☐ 72hrs ☐ don't know
- 5) Which of the following is the universally accepted symbols for Bio-hazard?
- ☐    ☐ don't know ☐

Section B

6) Do you segregate Bio Medical Waste according to different categories?

- ☐ Yes ☐ no ☐ don't know

7) Where do you dispose cotton, gauze & other items contaminated by blood and other body fluids?

- ☐ Red plastic bag ☐ Black plastic bag
☐ Yellow plastic bag ☐ Puncture proof
containers

8) The bin/bucket for discarding rubber/latex gloves and disposable plastics has:

- ☐ Red plastic bag ☐ Black plastic bag
☐ Yellow plastic bag ☐ Puncture proof
containers

9) The bin/bucket for discarding disposable needles has:

- ☐ Red plastic bag ☐ Black plastic bag
☐ Yellow plastic bag ☐ Puncture proof
containers

10) Which of these colors is not a standard for Bio Medical Waste disposal

- ☐ Red ☐ yellow ☐ black ☐
pink

Section C

11) Waste Management efforts by the hospital are of not much significance.

- ☐ Agree ☐ disagree ☐ can't say

12) Do you think labelling of waste disposal containers has any clinical significance?

- ☐ Yes ☐ no ☐ don't know

13) Do you feel your knowledge on Bio medical waste management is adequate?

- ☐ Yes ☐ no

14) Do you feel the hospital should conduct programs for upgrading knowledge on Bio Medical Waste Management of the hospital staff?

☐ Yes ☒ no

15) Are you willing to attend such programs organized by the hospital?

☐ Yes ☒ no ☒ can't say

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3. isebindia.com/95_99/99-07-2.html