Study on Relation Between Quality and Cost in a Tertiary Care Hospital

By

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Dissertation submitted for the partial fulfillment of the

MBA Hospital and Health Management

Academic year, 2014-2016

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TO WHOMSOEVER MAY CONCERN

This is to certify that **Dr. Nazia Zaidi** student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone dissertation training at **Max Super Specialty Hospital, Dehradun** from February 08 th 2016 to May 08th 2016.

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

I wish her all success in all future endeavors.

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9 May 2016

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Dr. Nazia Zaidi**, pursuing MBAHM (Management in Hospital & Health) from IHMR University (Jaipur), has done her internship in the department of Medical Quality Max Super Speciality Hospital, Dehradun from **08-Feb-2016** to **08-May-2016(**03 months).

She was a keen and enthusiastic intern.

We wish her all the best for her career.

For Max Healthcare Institute Ltd

Neha Shrivastav
DGM & Unit Head
Human Resources

THE IIHMR UNIVERSITY, JAIPUR

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled A Study on essential Quality and cost relationship in a tertiary care Hospital and submitted by (Name) Dr. Nazia Zaidi Enrollment No. 0175 under the supervision of Dr. Monika Chaudhary for award of Postgraduate Diploma in Hospital and Health/ Pharmaceutical / Rural Management of the University carried out during the period from 8 Feb 2016 to 8 May 2016 embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Signature 13/May/2016

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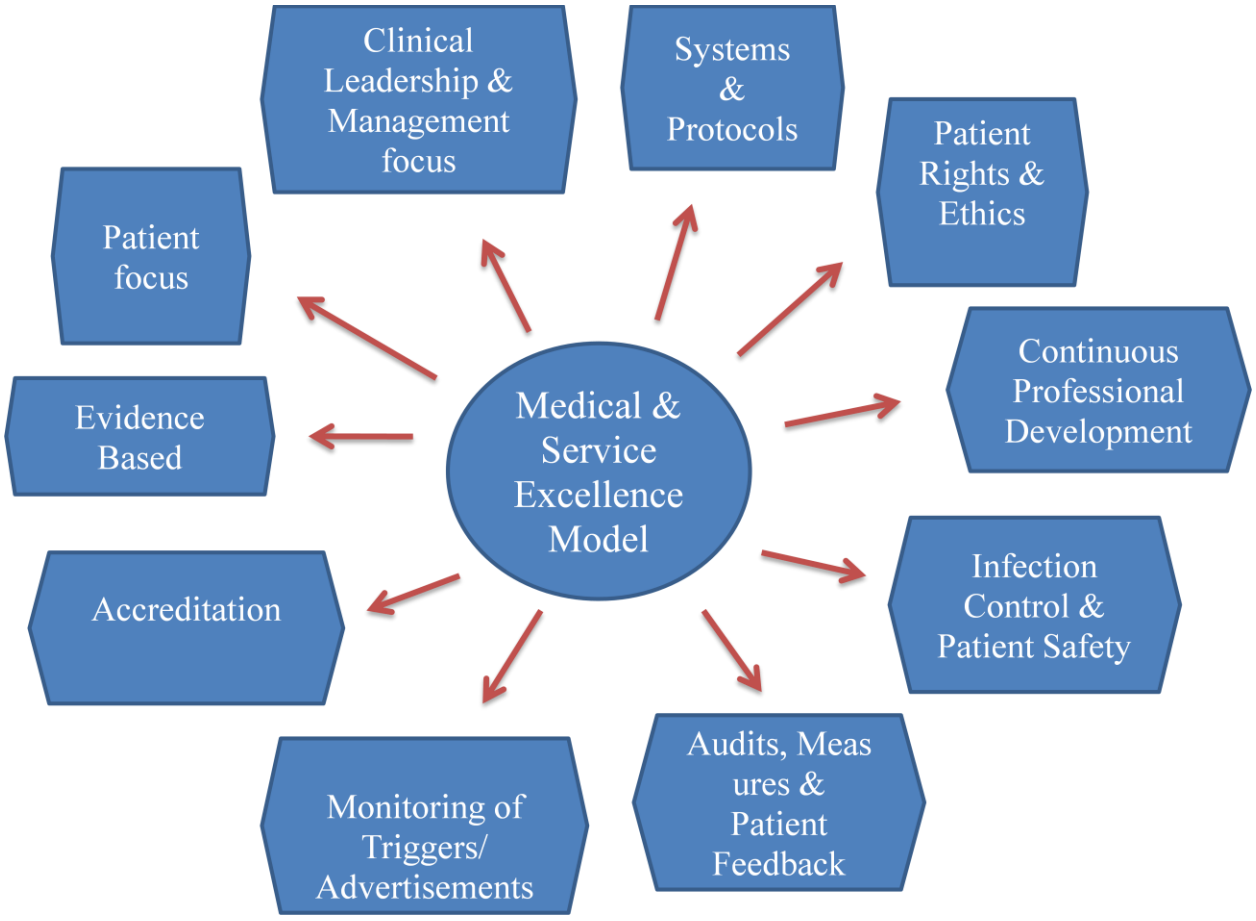
Abbreviation	Meaning
MSSH	Max Super Speciality Hospital
DDN	Dehradun
NCR	National Capital region
NGO	Non Governmental Organisation
OT	Operation Theatre
IPD	In Patient department
ONCO	Oncology
NEURO	Neurology
URO	Urology
ENT	Ear Nose Throat
EMS	Emergency Medical Superintendent

INTRODUCTION

Max Healthcare follows a core of 'Patient Centred Care'. Widely acknowledged nationally and internationally for its quality patient care, Max has successfully implemented the "Medical Excellence Model" through its clinical team of expert physicians and nurses who work together in an integrated manner, assessing patient needs, ordering tests, planning treatments, scheduling surgeries, monitoring progress and planning for early discharge to home.



The pillars of this model include:

- Clinical governance
- Credentialing and clinical privileging of physicians & nurses

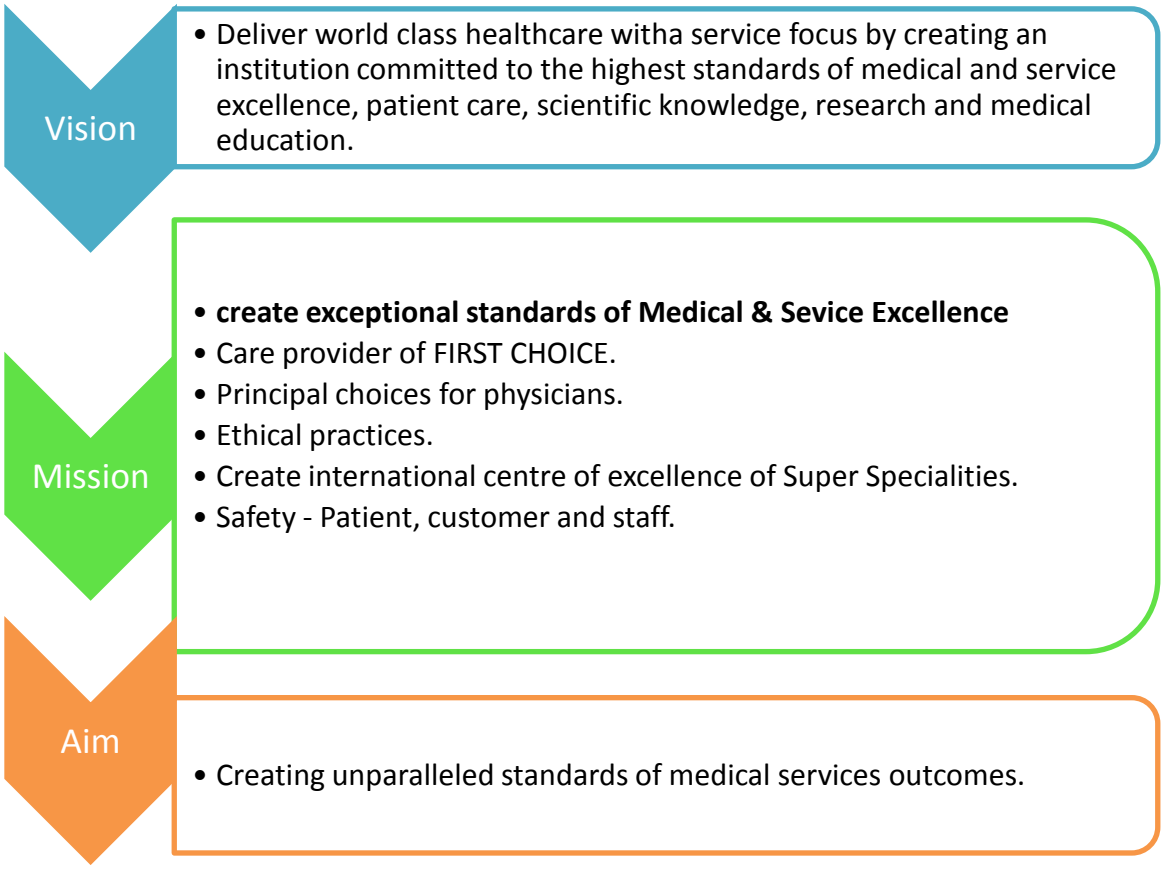
- Use of standardized, evidence based protocols
- Patient and staff safety
- Infection control
- A culture of audit and continuous professional development

Max India Group. Was invented as a group in 2000,from being manufacturing business it transformed into a service sector enterprise and entered into the "The business of Life". It stands a multi business corporate, driven by the spirit of enterprise and focuses on people and service oriented business. It protects life through the Life Insurance subsidiary Max New York Life, a joint venture between Max India and New York Life. a fortune 100 company. 'care for life' through the healthcare company, Max Healthcare, a subsidiary of Max India Limited; 'Enhance life' through the Health Insurance Company, Max Bupa Insurance, a joint venture between Max India and Bupa Finance Plc., and 'Improve Life' through the Clinical Research Business, Max Neeman, a interest speciality Products manufacturing for packaging industry. As a group it has the manpower of over 80.000 people and serve over 3 Million customers. Also actively involved in social service through Max India Foundation. Committed to fostering an exclusive society, Max India Foundation spearheads the CSR initiatives of all groups companies and also partners with several reputable NGO's.

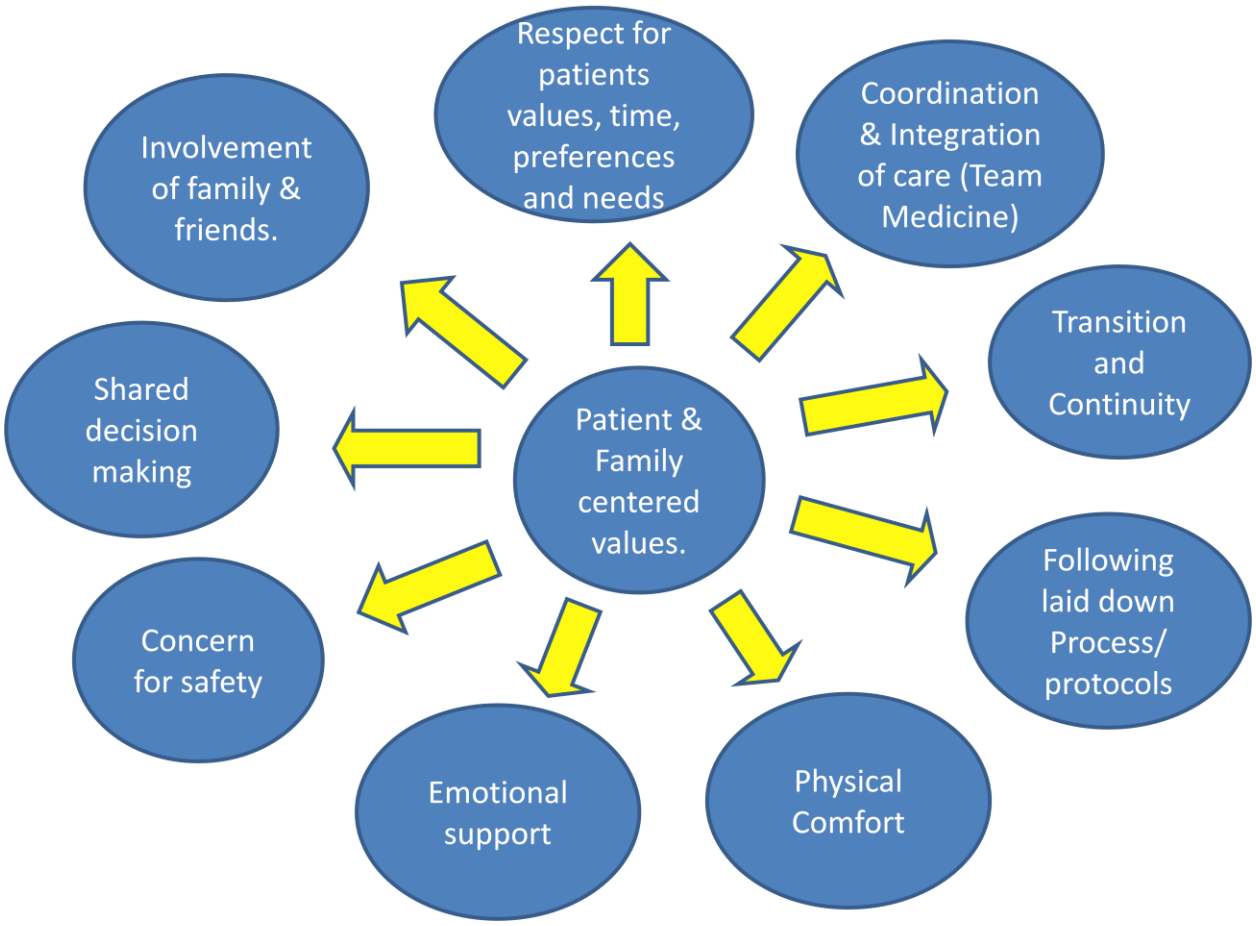
Max Healthcare commenced operations in 2001 and is India's first provider of comprehensive, seamlessly integrated, world class healthcare services. It is primarily focused on the National Capital Region(NCR) of Delhi, and is well known on its way to become the region's key healthcare provider in private sector.

Max DDN speciality – Cardiology, Neurosciences and Orthopaedics. Holds the best team of doctor's in the three speciality zones all over Dehradun.

Vision, Mission and Aim of MHC :



MHC Patient & Family Centred values:



The branches of Max Healthcare –Max Hospital Saket East & South, Max Hospital Saket west, Max Hospital Patparganj, Max Hospital Panchsheel, Max Hospital Pitampura, Max Hospital Noida, Max Hospital Centre Panchsheel, Max Hospital Gurgaon, Max Hospital Shalimar Bagh, Max Hospital Dehradun, Max Hospital Mohali, Max Hospital Bhatinda.

Introduction

Quickly rising cost in healthcare is an altering cause of concern across the world. With a large section of healthcare practitioners in the private sector, the government has realized the need to meliorate medical care services and has stepped in to regulate the quality of medical care services by introduction of various quality accreditation norms like the NABH and NABL As per available information (Care Continuum, 2005), the healthcare spending per capita per annum in India was about $109, with total healthcare spending in the range of 4.9% of the country's GDP.

Empirical evidence suggests that there is an increasing demand for healthcare services across India, affordability remains a pertinent issue. This has resulted in market segmentation (Shah, Mohanty, 2010), where on one hand there is an increasing demand for quality medical care services while on the other hand there is a demand for medical care services at affordable cost. The demand for the latter has inevitably resulted in poor quality of medical care services with poor health outcomes.

It is simple to compute the direct costs for various medical services, however to compute the cost of quality is not only difficult but rather elusive, which has resulted in over dependence on subjective criterions (Klint, Long, 1989).Several indicators of poor quality that incurs to cost of hospital as well as from the pocket of the patient results in negative output for the hospital and its reputation. The factors taken under consideration under this study for Max Super Specialty hospital are, needle stick injuries, return to ICU of a patient, a survey was also conducted to observe the awareness of needle stick injury amongst housekeeping and nursing staff.

Review of Literature

More than 30 years after the advent of HIV/AIDS, healthcare workers are still lacking in awareness, education and training about the threat of blood borne pathogen exposure from needle sticks and other sharps-related injuries. Percutaneous injuries, caused by needle sticks and other sharps, are a serious concern for all health care workers (HCWs) and pose a significant risk of occupational transmission of blood borne pathogens. Needle stick injuries (NSI) are wounds caused by sharps such as hypodermic needles, blood collection needles, IV cannulas or needles used to connect parts of IV delivery systems.

The causes include various factors like type and design of needle, recapping activity, handling/transferring specimens, collision between HCWs or sharps, during clean-up, manipulating needles in patient line related work, passing/handling devices or failure to dispose of the needle in puncture proof containers. Hospitals invest a lot in these injuries to protect their employees and keep a healthy work environment keeping safety of both patient and employees. On the other hand return of patient from ward to ICU on the same or at a gap of one day causes indirect cost to the hospitals, investing in the doctor's as well as the time of procedure and patient. Giving a poor impact on both levels that is hospital brand and direct indirect costs.

Cost of quality (COQ) is a financial measure of the quality performance of an organization. It is essentially a measure of lack of quality & also can be termed as cost of bad quality. Understanding COQ helps organizations to develop quality conformance as a useful strategic business tool that improves their product/services and brand image. This is vital in achieving the objectives of a successful organization. COQ is primarily used to understand, analyze and improve the quality performance. The cost associated with quality are divided into two, cost due to poor quality and associated with improving quality. This study was conducted to review the poor quality and cost impact of the same on the above mentioned measures.

RESEARCH QUESTION -

- Hospitals are searching for ways to improve quality of care and promote effective quality improvement (QI) strategies. The findings from this study helps to identify the current performance in the quality indicators and its impact on cost, helps to plan action steps for hospital to move in the right direction. To promote greater use of practices and policies that enhance quality and QI in hospital. The study helps to identify the corrective actions needed to reduce cost by improving poor quality measures.

RESEARCH OBJECTIVES –

1) To retrospect the impact on cost with respect to quality measures, .i.e. needle stick injury and return to ICU cases reported within a day.
2) To analyze the reasons behind poor quality performance.
3) To suggest the necessary changes for improving the quality performance.

DATA COLLECTION & METHODOLOG -

Data Collection:

Data collection is the process of gathering and measuring information on targeted variables in an established systematic fashion, which then enables one to answer relevant questions and evaluate outcomes.

The procedure followed is enumerated below:

i. The study was performed on previously complied data by Max Super Specialty Hospital on quality measures.

METHODOLGY:

Study Type – The previously complied data was rearranged and analyzed on different parameters, having interactions with the study group i.e. MSSH staff. The data was compared under different parameters. It helps to observe, without making any change in the current environment of the hospital. The study type is descriptive.

Sampling method – A survey was conducted to understand the reasons behind poor quality. Random staff was selected to schedule the survey.

Study Participants: Staff of MSSH participated in the survey to contribute to the study.

Study Technique – The data was rearranged using MS-excel sheets and observed to configure findings/outcome from the data also schedule was performed for more precise outcome of the study .

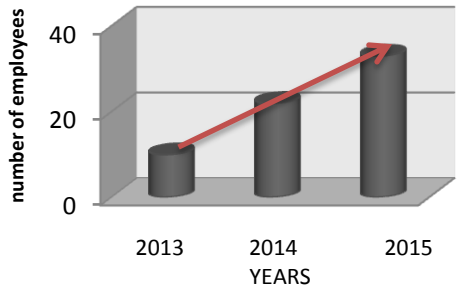
Data analysis – Done with the aid of MS-Excel sheets. The data was entered in sheets and then analyzed with the help of graphs. Data was analyzed for the following -

1) Number of needle stick injuries per year
2) Cost of needle stick injury per year
3) Needle stick injury as per profession
4) Location wise needle stick injury
5) Return to ICU within 7 days
6) Return to ICU within or 24 hrs
7) Reasons to return to ICU
8) Return to ICU department wise

Ethical Considerations- The confidentiality of the data given by MSSH was maintained.

INTERPRETATION –

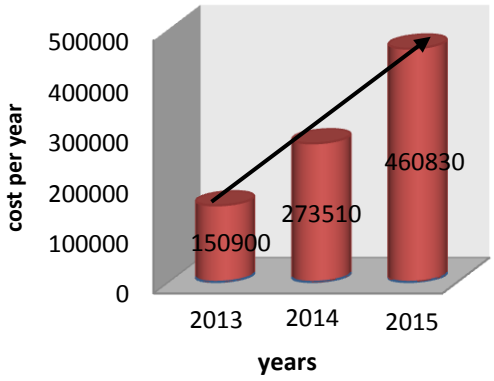
1)***NUMBER OF NEEDLE STICK INJURY PER YEAR***- The category analyzes the number of needle stick injuries took place each year in the staff of MSSH.



Years	Number of employees
2013	10
2014	22
2015	33

On observation – The number of needle stick injuries increased per year.

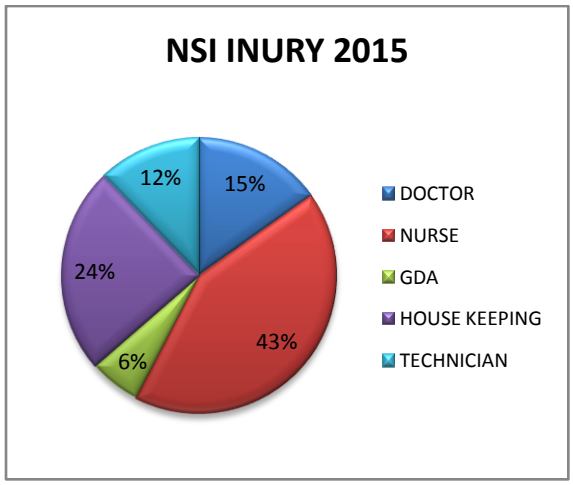
2) ***COST OF NEEDLE STICK INJURY PER YEAR*** – The category analyzes the cost invested in needle stick injury. This is the total cost per year invested in all employees taking follow up and medications. Average cost per employee comes out to be 13965rs in year 2015.

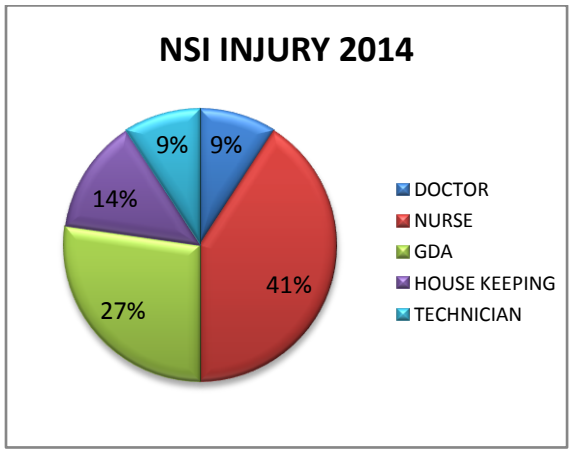


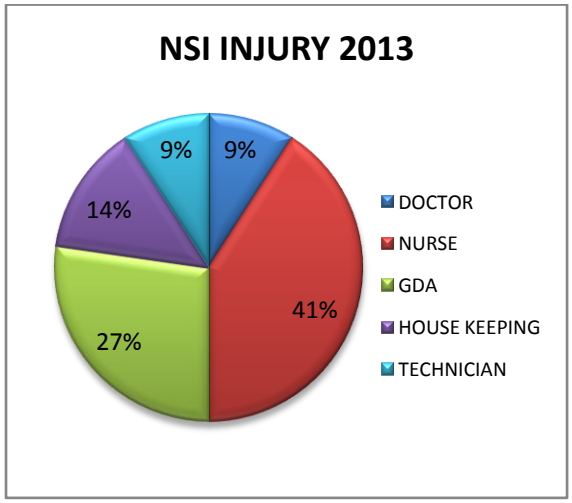
Year	Cost
2013	150900
2014	273510
2015	460830

On observation - The cost of needle stick injury increased per year as per as per the increase in number of injuries per year

1) ***NEEDLE STICK INJURY AS PER PROFESSION*** – The category analyzes the needle stick injury cases reported by staff which stays in first line interaction with patients.







- On observation – in all three years the percentage of needle stick injury was seen higher in nurses.
- An increase in the house keeping staff is seen from 14% in the 2014 to 24% in 2015.
- The percentage of needle stick injury in doctor's and technicians increased in the year 2015 to 15% and 12% respectively of the overall injuries.

Year 2015

profession	No.
Doctor	5
Nurse	14
GDA	2
Technician	4
House keeping	8

Year 2014

profession	No.
Doctor	2
Nurse	9
GDA	6
Technician	2
House keeping	3

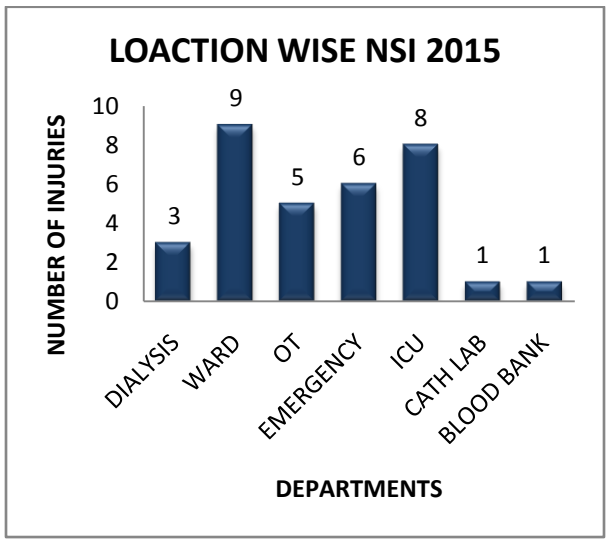
Year 2013*

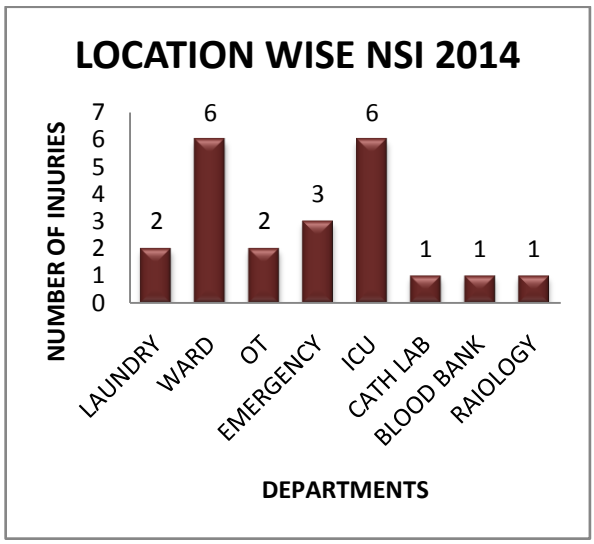
Profession	No.
Doctor	2
Nurse	4
GDA	2
Technician	1
House keeping	1

Needle stick injury as per profession- year wise.

*Data for 2013 was recorded from month of March.

2) ***LOCATION WISE NEEDLE STICK INJURY*** – This category analyzes data on the basis of number of cases reported from different departments.



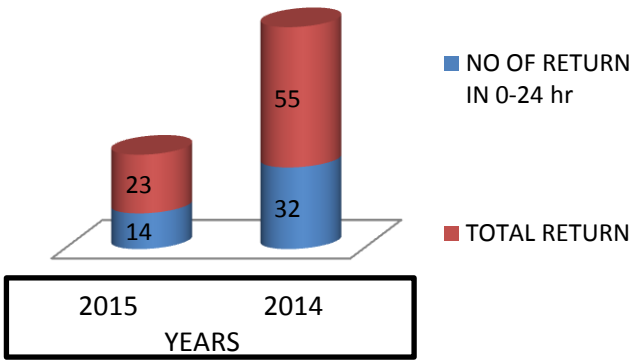


- On analysis of the complied data it was observed cases in ward, emergency, OT and ICU increased in year 2015 as compared to 2014.

5) ***RETURN TO ICU within 7 days and RETURN TO ICU within or 24 hrs*** – This category analyzes the patients who were transferred from ICU to ward and then were shifted back to the ICU within 7 days and within 0-24 hours.

The data analysis was done for years 2014 and 2015.

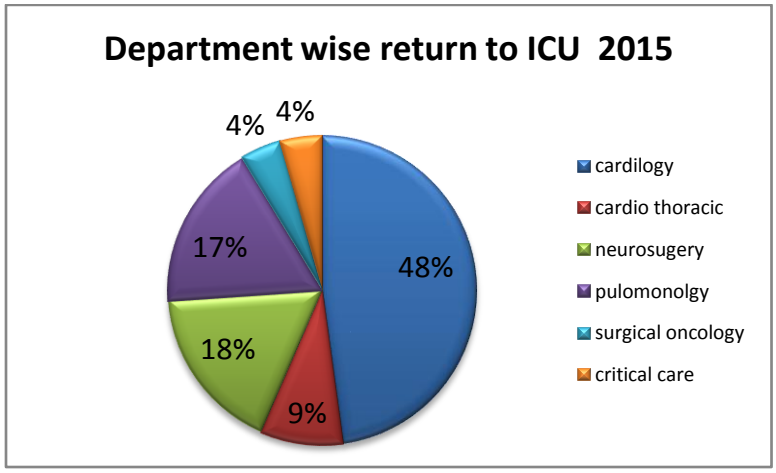
RETURN TO ICU PER YEAR

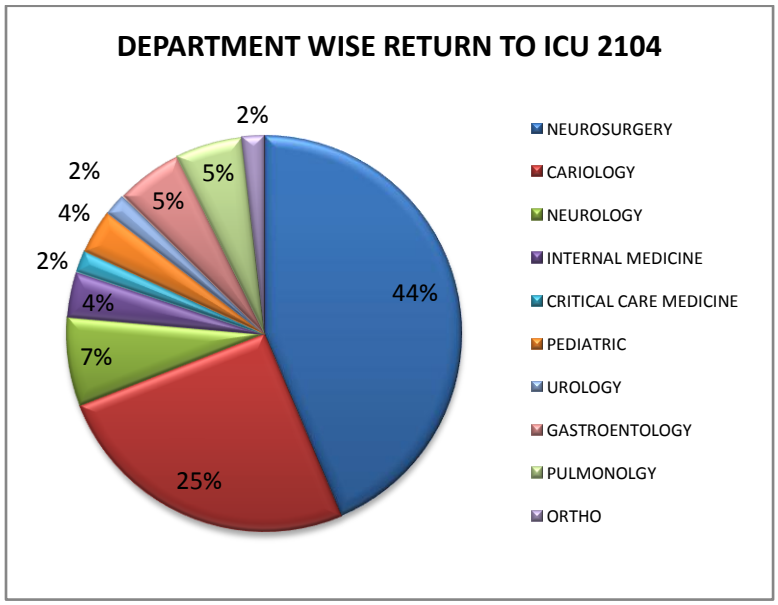


Year	2014	2015
Total return per year	55	23
Number of return in 0-24 hr per year	32	14

- On observation – In 2014 there were total 55 patients who were shifted back to ICU after being transferred to ward, out of which 32 patient's were transferred back to ICU within or 24 hours, i.e. 58% of the total returns were transferred back to ICU within the mentioned gap.
- In 2015 total returns were recorded to 23 patient's out of which 14 were transferred back to ICU within or 24 hours, i.e. 61% of the total returns were transferred back to ICU within the mentioned gap.
- A significant decrease was seen in the return to ICU cases from year 2014 to year 2015.

6) ***RETURN TO ICU FROM DIFFERENT DEPARTMENTS*** – This category analyzes the different departments under which the patients were transferred back to ICU within 0-24 hrs.





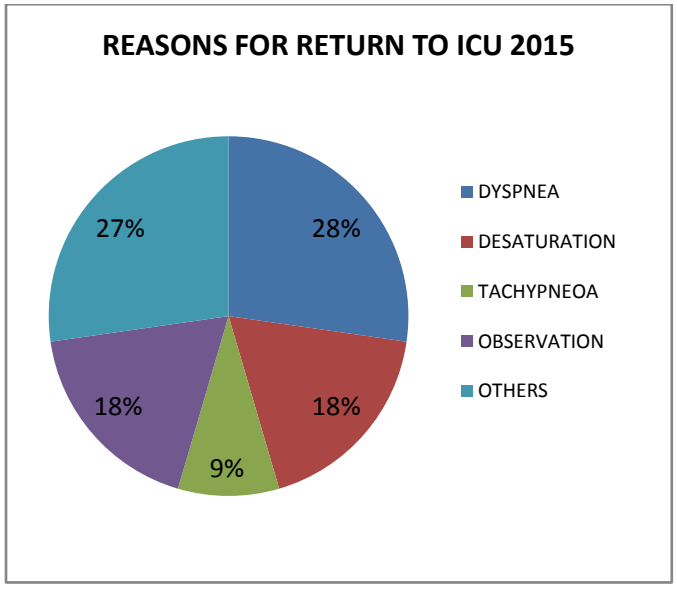
- On observation -In year 2014 out of 55 entries the most transfers were from the department of neurosurgery i.e 44% followed by the department of cardiology i.e. 25%.
- While in year 2015 the cases of transfer within 0-24 hrs increased in the department of cardiology i.e. 48% followed by the neurosurgery i.e. 18%.

YEAR 2014	
NEUROSURGERY	**24**
CARIOLOGY	14
NEUROLOGY	4
INTERNAL MEDICINE	2
CRITICAL CARE MEDICINE	1
PEDIATRIC	2
UROLOGY	1
GASTROENTOLOGY	3
PULMONOLOGY	3
ORTHO	1

YEAR 2015	
CARDIOLOGY	**11**
CARDIO THORACIC	2
NEUROSURGERY	4
PULMONOLOGY	4
SURGICAL ONCOLOGY	1
CRTICAL CARE	1

Data for category – department wise return to ICU for year 2014 and 2015

7) ***REASON FOR RETURN TO ICU*** – This category analyzes various reasons behind the return to ICU within 7days and 0-24 hours.Various reasons were identified and graphed so spot the maximum cause in cases.

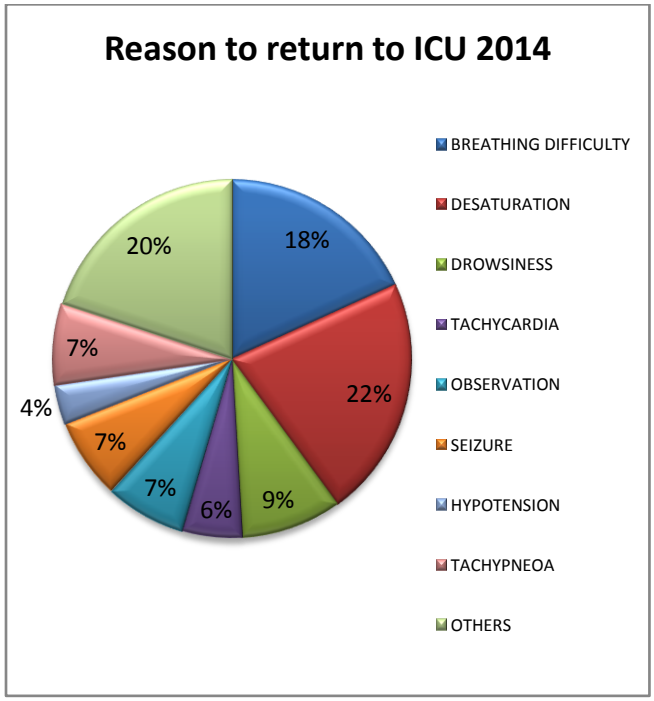


DYSPNEA	**4**
BREATHING DIFFICULTY	2
DESATURATION	4
TACHYPNEOA	2
OBSERVATION	4
OTHERS	6

Others included - burning in chest, hypotension, seizures, disoriented, cardiac arrest, multiple bleed in colon.*

*in others each cases was recorded just once.

- On observation – In year 2015, Dyspnea, desaturation and observation cases reported with higher percentage of transfer of patients from ward to ICU within 7 days.



BREATHING DIFFICULTY	**8**
DESATURATION	12
DROWSINESS	5
DYSPNEA	2
TACHYCARDIA	3
OBSERVATION	4
SEIZURE	4
HYPOTENSION	2
TACHYPNEOA	4
OTHERS	11

Others included -abdominal distention, co2 retention, convulsions, csf leak, deteriorated, fever, hypokalemia, loc, metabolic acidosis.*

*in others each cases was recorded just once.

- On observation – In year 2014, desaturation and breathing difficulty/dyspnea cases reported with higher percentage of transfer of patients from ward to ICU within 7 days.

- Data was also analyzed for return to OT with no significant reason as highly dependable on patient's condition.

SURVEY INTERPRETATION –

A survey was conducted with the nursing and the house keeping staff about their awareness on the needle stick injury. Survey consisted of a verbal questionnaire with a likert rating, both survey's were conducted with different questions and different markings.

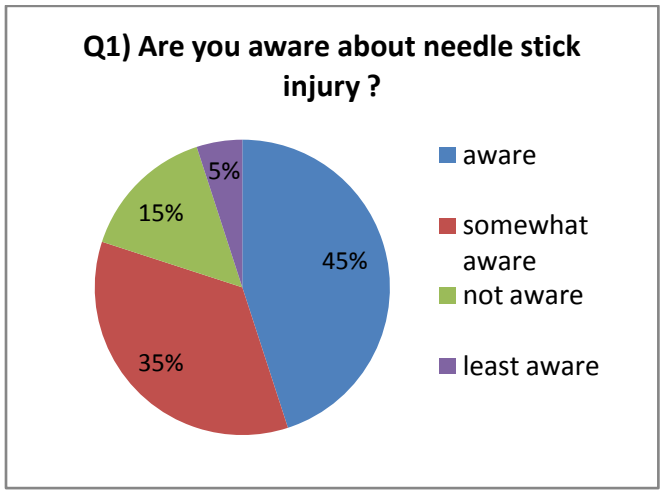
SURVEY 1- HOUSE KEEPING STAFF

Questionnaire on needle stick injury awareness :

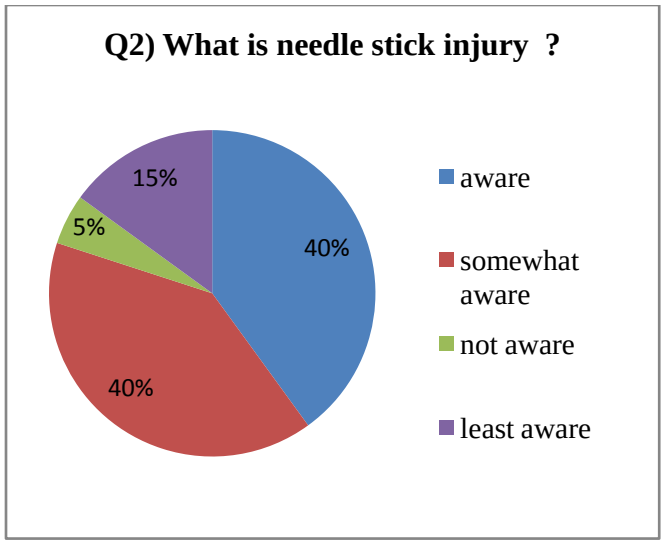
Housekeeping staff verbally interviewed and rated on a scale of 1-5, i.e. 1- least aware, 2- not aware, 3- somewhat aware, 4- aware, 5- most aware. For question 10 and 11 , 1- never,2- no, 3- neutral, 4- not all,5- yes.

N = 20

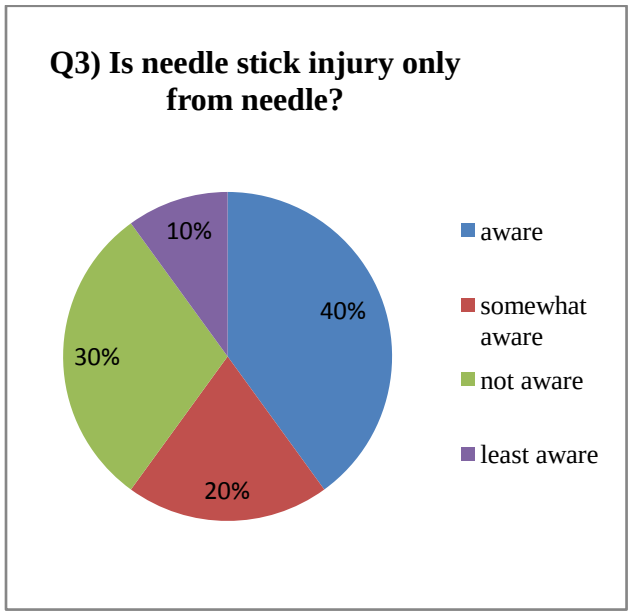
DATA INTERPRETATION -



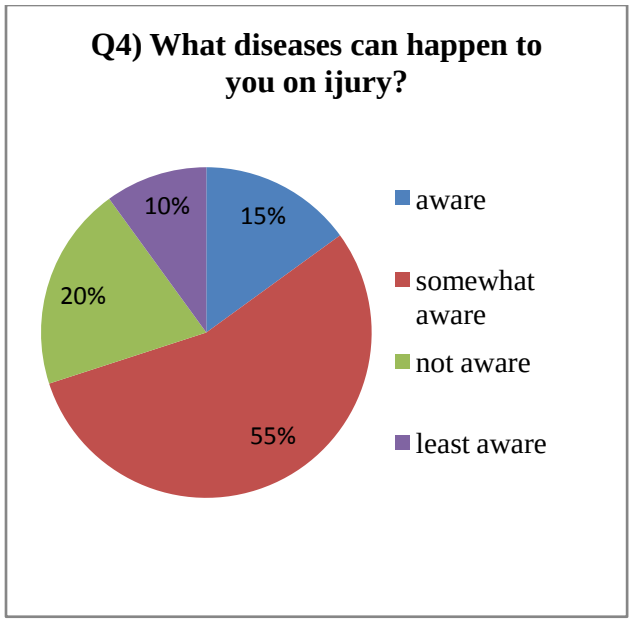
- On analysis of the complied data it was observed that 45% of the staff was aware about needle stick injuries, while 35% of the staff was somewhat aware followed by 15% with not aware and 5% with least awareness on needle stick injury.



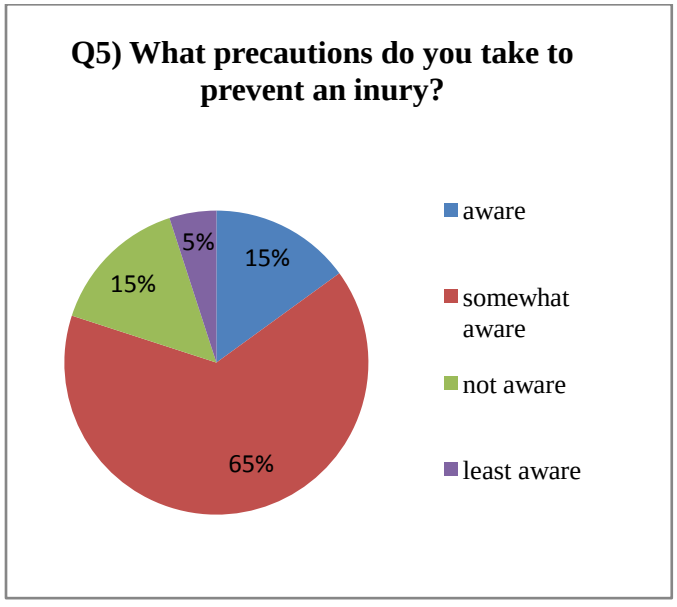
- On analysis of the complied data it was observed that 40% of the staff was aware about needle stick injuries, while 40% of the staff was somewhat aware .



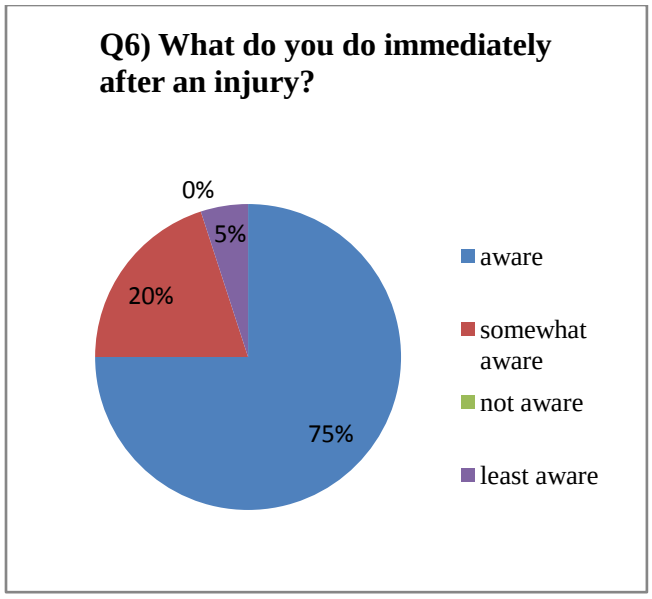
- On analysis of the complied data it was observed that 40% of the staff was aware about that needle stick injuries are any injuries from sharps, while 20% of the staff was somewhat aware.



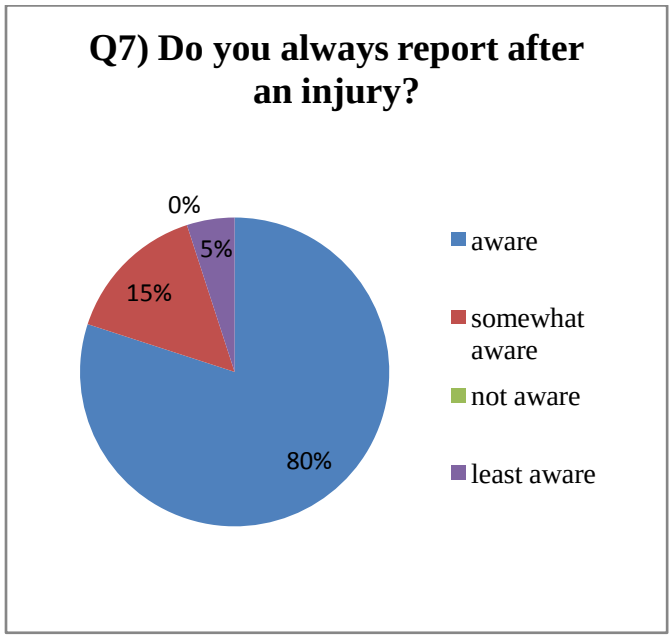
- On analysis of the complied data it was observed that 15% of the staff was aware about the infections from a needle stick injury, while 55% of the staff was somewhat aware.



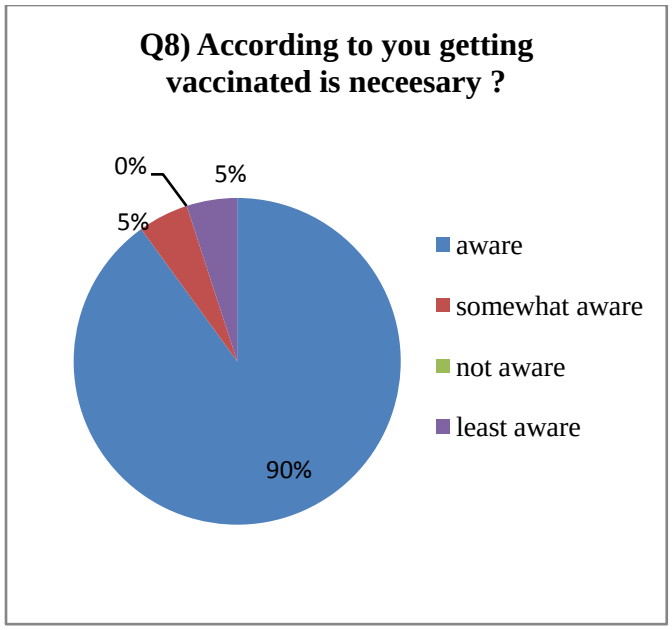
- On analysis of the complied data it was observed that 15% of the staff was aware about precautionary measures taken for needle stick injuries, while 65% of the staff was somewhat aware .



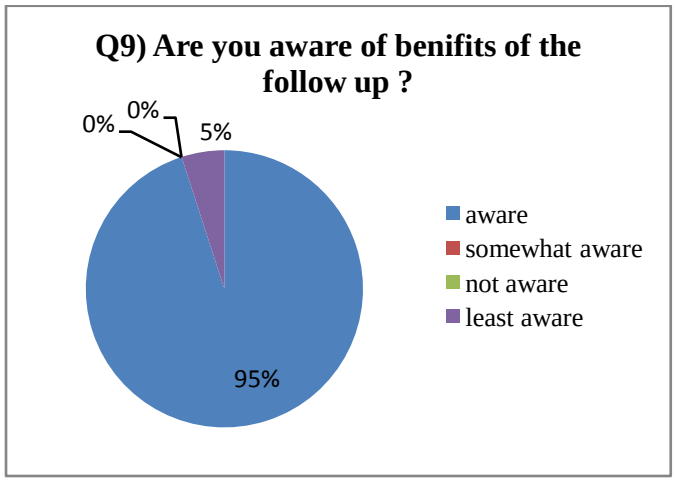
- On analysis of the complied data it was observed that 75% of the staff was aware about measures taken on an injury, while 20% of the staff was somewhat aware.



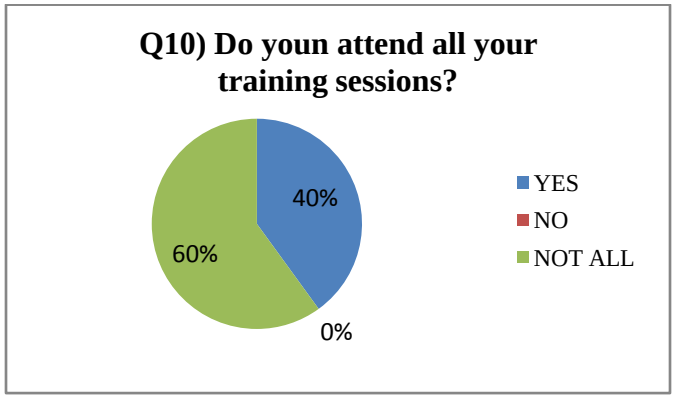
- On analysis of the complied data it was observed that 80% of the staff was aware about reporting on an injury, while 15% of the staff was dicey on always reporting.



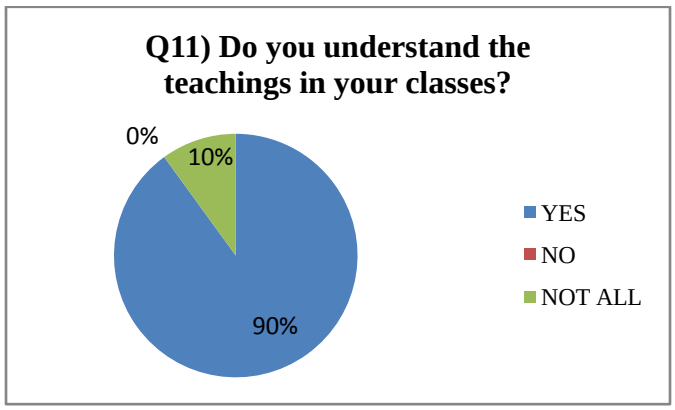
- On analysis of the complied data it was observed that 90% of the staff agreed that vaccination is necessary, while 5% of the staff was dicey on the same.



- On analysis of the complied data it was observed that 95% of the staff was aware about benefits from the follow up, while 5% of the staff was least aware on the same .



- On analysis of the complied data it was observed that 40% of the staff was able to attend all their training sessions, while 60% of the staff could not attend all.



- On analysis of the complied data it was observed that 90% of the staff found the sessions helpful, while 10% of the staff was dicey on the same.

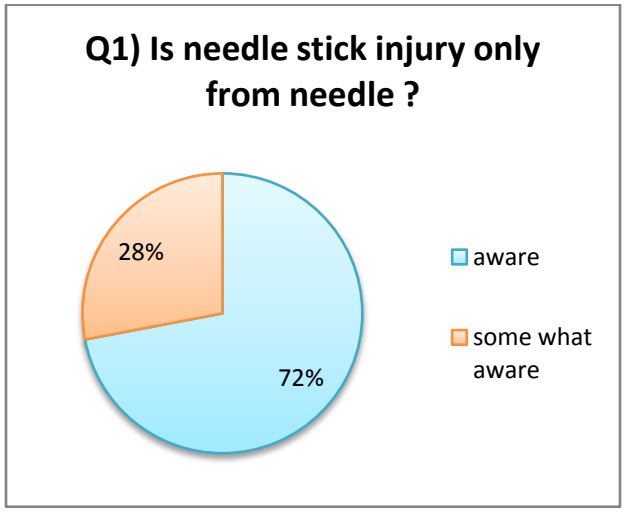
SURVEY II- NURSING STAFF

The rating was done on likert scale i.e.- 1-5 ,1 -least aware,2- not aware,3- somewhat aware,4-aware,5-complete aware, for question 7 & 8,rating was , 1-yes,2-no,3-not all, for question 6 most common option was recorded.(combinations as mentioned)

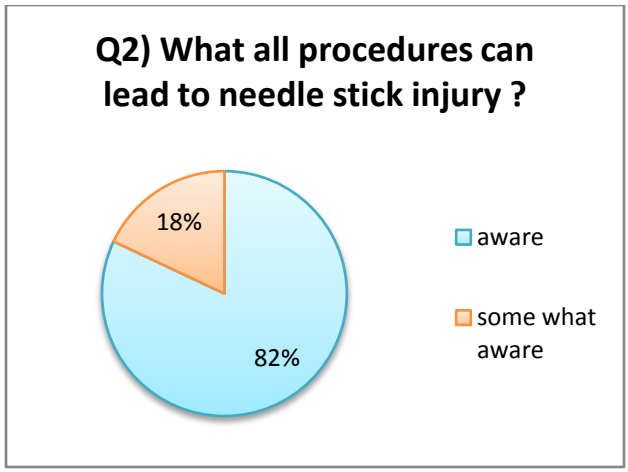
N = 50

abc	fast working, improper handling, less attention
eac	panic, fast working, improper handling
ab	fast working, improper handling

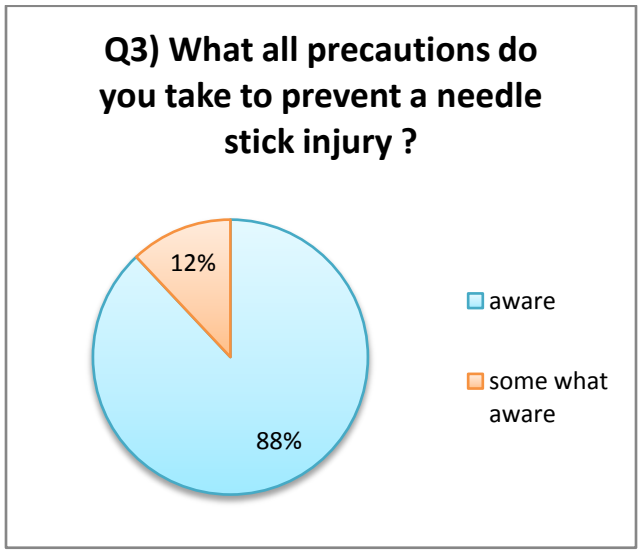
INTERPRETATION –



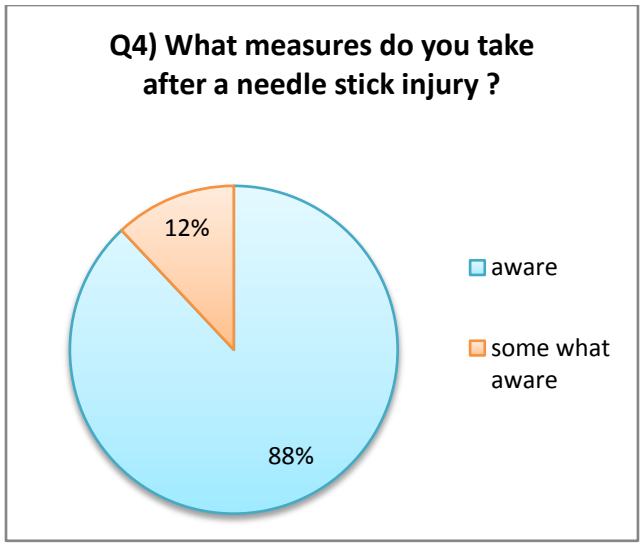
- On analysis of the complied data it was observed that 72% of the staff was aware that needle stick injury is just not via needle but also from any sharp object, while 28% were some what aware about the same.



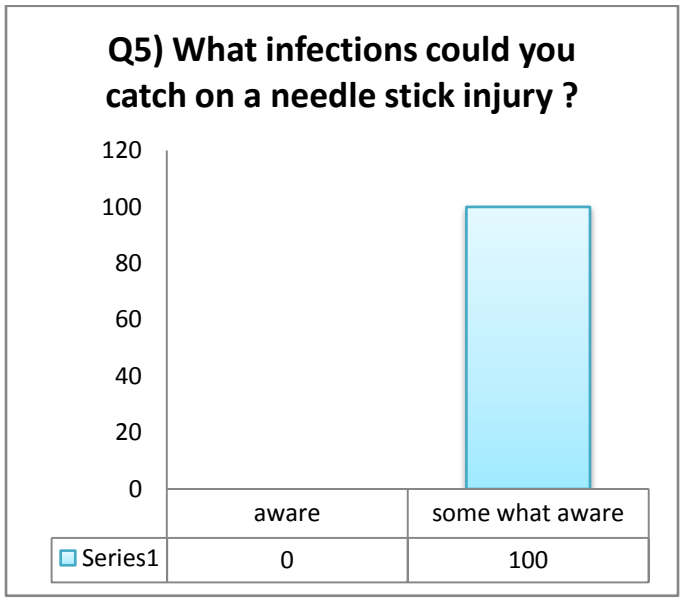
- On analysis of the complied data it was observed that 82% of the staff was aware about the procedures that can lead to needle stick injury, while 28% were somewhat aware about the same.



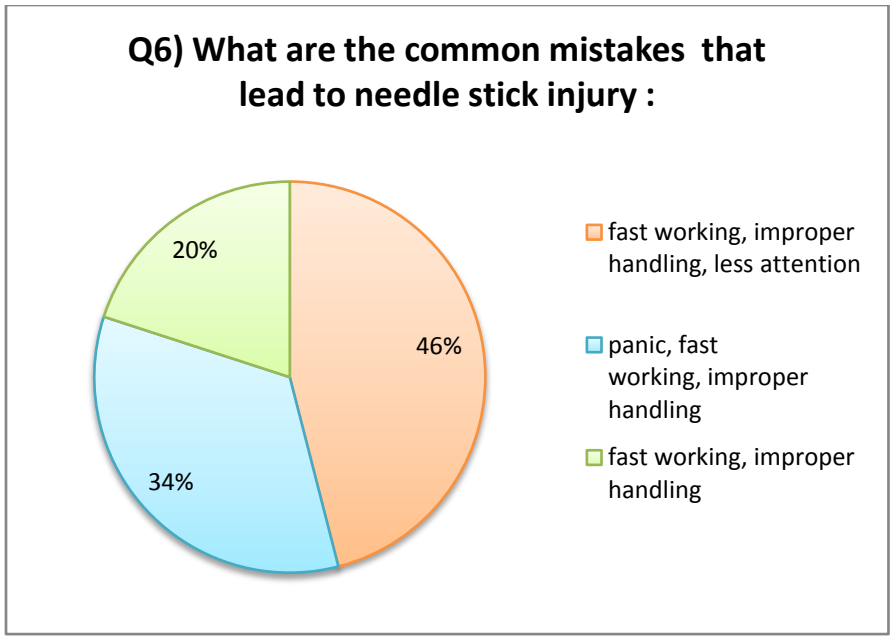
- On analysis of the complied data it was observed that 88% of the staff was aware about all precautionary measures to prevent an injury, while 12% were somewhat aware about the same.



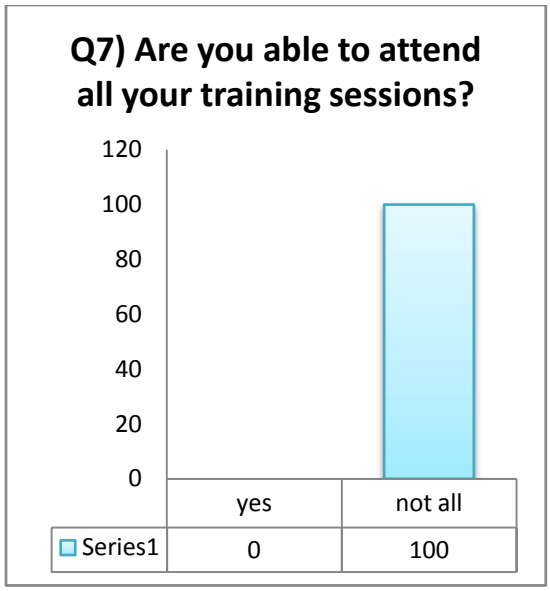
- On analysis of the complied data it was observed that 88% of the staff was aware about all measures taken after the injury, while 12% were somewhat aware about the same.

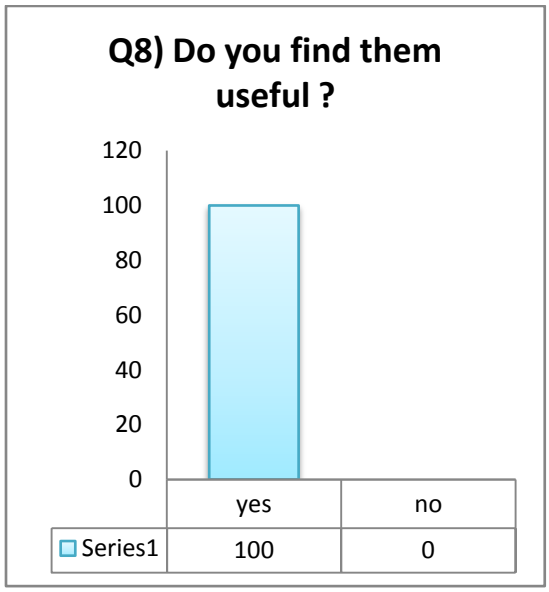


- On analysis of the complied data it was observed that the nursing staff was somewhat aware about the infections that could develop after a needle stick injury.



- On analysis of the complied data it was observed that 46% of the staff found common causes of needle stick injury to be , fast working, improper handling and less attention while handling during procedures, while 34% of staff found common causes of needle stick injury to be panic during emergency, fast working and improper handling during procedures.





- On analysis it was observed that the staff was unable to attend all the training sessions , also the found the classes to improve their knowledge.

CONCLUSION -

- Quality is an important factor for any organization to maintain its goodwill and customer relationship, it is a business tool that improves their products services and brand image. The study outcome concludes that measures should be taken to reduce NSI in a hospital, just not in cost prospect but also for a healthy environment. 39% of the staff was injured during sample taking in year 2015, 36% of the staff was injured while discarding the waste in year 2014.
- In year 2015 the cases reported were 5% as compared to year 2014 it was 4%, 1% increase with an increase in the cost margin of 2 lakh. The average cost increased by 1500 from year 2014 to 2015. More focus should be given to the nursing as well as housekeeping staff to reduce the number of cases by making them more aware about the preventive measures. The staff was unable to attend all the training sessions while they found the classes very helping to gain knowledge.
- There was a direct and indirect cost impact with return to ICU, the direct impact on patients with going through all test procedures while indirect to the hospital's brand name and image and patient satisfaction. The returns to ICU within seven days decreased from year 2014-2015, but the percent of transfer within 24hours remained same, thus the factors causing the same which can be managed by the staff can be taken under consideration while further studies can be done to know the cost estimate.

RECOMMENDATIONS –

NEEDLE STICK INJURY -

- Use of safe injections devices can be introduced in the daily routine.
- Frequent feedbacks from the staff about their awareness on NSI can be held.
- Modify work practices to reduce risks.
- Quaternary review of needle stick injury by the top management can help reducing the same.
- Training sessions to be scheduled such that all the staff should be able to attend the same.

RETURN TO ICU -

- Corrective action measures to be planned in the wards to avoid dyspnea and desaturation.
- Frequent monitoring of critical patients can be done when transferred to wards.

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Annexure -1

House keeping survey questionnaire					
Q 1) Are you aware of needle stick injury ?	1	2	3	4	5
Q 2) What is needle stick injury ?	1	2	3	4	5
Q 3) Is needle stick injury only from needle ?	1	2	3	4	5
Q 4) What diseases can happen to you on injury ?	1	2	3	4	5
Q 5) What precautions do you take ?	1	2	3	4	5
Q 6) What do you do immediately after injury ?	1	2	3	4	5
Q 7) Do you report on an injury ?	1	2	3	4	5
Q 8) According to you is vaccination necessary ?	1	2	3	4	5
Q 9) Are you aware of the benefits of the follow up ?	1	2	3	4	5
Q 10) Do you attend all your training sessions ?	1	2	3	4	5
Q 11) Do you understand the teachings in your classes ?	1	2	3	4	5

Annexure -2

Nursing survey questionnaire					
Q1) Is needle stick injury only from needle ?	1	2	3	4	5
Q2) What all procedures can lead to needle stick injury ?	1	2	3	4	5
Q3) What all precautions do you take to prevent a needle stick injury ?	1	2	3	4	5
Q4) What measures do you take after a needle stick injury ?	1	2	3	4	5
Q5) What infections could you catch on a needle stick injury ?	1	2	3	4	5

Q6) What are the common mistakes that lead to needle stick injury : *

a) Fast working
b) Improper handling
c) Less attention
d) By fault of others
e) Panic during emergency

*Combinations made were -

abc	fast working, improper handling, less attention
eac	panic, fast working, improper handling
ab	fast working, improper handling

Q7) Are you able to attend all your training sessions?	1	2	3
Q8) Do you find them useful ?	1	2	3