BIOMEDICAL WASTE MANAGEMENT PRACTICES

At

SADAR HOSPITAL NAWADA, BIHAR

Post Graduate Diploma in Health and Hospital Management

By

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Roll No. PG/11/097

International Institute of Health Management Research

New Delhi

Date: 7th Feb. to 30th April 2013

बिहार सरकार

आशायें हर गाँव की, उम्मीदें जहाँ भर की

District Health Society, Nawada

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Memo No. : 460 Dated : 27/04/2013

TO WHOM SOEVER IT MAY CONCERN

This is to Certify that **Miss. Sony Kumari** is working in Sadar Hospital, Nawada (Bihar) as a **"Hospital Manager"** in our organization from **07th February, 2013** to **till now**. She is hardworking and Sincere. Apart from that she is Punctual, Disciplined and Devoted towards her work.

I wish all the best in her life.

27/4/13

Civil Surgeon Cum Member Secretary,
District Health Society, Nawada

....क्योंकि हंसमुख बच्चा आपकी इच्छा!

बच्चे दो ही अच्छे

Certificate of Approval

The following dissertation titled "**BIOMEDICAL WASTE MANAGEMENT PRACTICES At District Hospital Nawada, Bihar**" is hereby approved as a certified study in management carried out and presented in a manner satisfactory to warrant its acceptance as a prerequisite for the award of **Post- Graduate Diploma in Health and Hospital Management** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation

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CERTIFICATE OF APPROVAL

The following dissertation project titled **"BIOMEDICAL WASTE MANAGEMENT PRACTICES At District Hospital Nawada, Bihar"** is hereby approved as certified study in management carried out and presented in a manner satisfactory. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the summer intern project report only for the purpose it is submitted .

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ABSTRACT

Medical care is vital for our health and life, but the waste generated from medical activities in health care facilities represents a real problem of living nature and human world. Improper management of waste generated in health care facilities causes a direct health impact on the community, the health care workers and on the environment. Every day, relatively large amount of potentially infectious and hazardous waste are generated in the health care facilities around the world. Indiscriminate disposal of BMW and exposure to such waste possess serious threat to environment and to human health that requires proper hospital waste management system which should include proper collection, segregation, storage, transportation and specific treatment and management prior to its final disposal.

The present review article deals with the basic issues as definition, categories, problems relating to biomedical waste and procedure of handling and disposal method of Biomedical Waste Management. It also intends to create awareness amongst the personnel involved in health care unit.

ACKNOWLEDGEMENT

This training would not have been completed without a substantial support from a great number of people. Although it is not possible to acknowledge each and every person individually, I would like to thank all those who contributed their time and efforts.

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TABLE OF CONTENT

List Of Tables

List of Figures

ABBREVIATIONS

BMW- BIO-MEDICAL WASTE

WM- WASTE MANAGEMENT

OT- OPERATION THEATER

ICU- INTENSIVE CARE UNIT

OPD- OUT PATIENT DEPARTMENT

WHO- WORLD HEALTH ORGANISATION

PART-I
HOSPITAL PROFILE

History

Sadar Hospital Nawada had been established in 1891 under Gaya district as Sub- Divisional Hospital and has completed 122 years of services in Magadh region. In 1973 it was upgraded to District Level Hospital as Sadar Hospital. It is primarily focused on the nearest all areas and as well on its way to become the region's one of the best health care provider.

Sadar Hospital Nawada has a capacity of 125 beds and has on its anvil future plans of expanding it to 300 bedded hospital with some additionals facilities which is already sanctioned by the Govt. of Bihar.

LOCATION

Sadar Hospital Nawada is strategically located on the main road of the town and is well connected with capital of Bihar Patna, Jharkahand and West bengal. It serves the whole population (22,66,506) of Nawada district.

HIGHLIGHTS OF THE HOSPITAL

- Emergency Management
- General Medicine & Medical Specialities
- General Surgery & Surgical Specialities
- Department Of Obstetrics & Gynaecology
- NBCC
- Paediatric Department
- Operation Theatre
- Department Of Ophthalmology and ENT
- Department of Dental Surgery
- Department of Pathology
- Department of Radiology with X-RAY and Ultrasound Fcaility
- Ambulance Services
- Blood Bank
- AIDS Control and Linked ART Centre

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 Biomedical Wastes generated from health care units depend upon a number of factors such as 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. Now it is a well established fact that there are many adverse and harmful effects to the environment including human beings which are caused by the "Hospital waste" generated during the patient care. The problems of the waste disposal in the hospitals and other health-care institutions have become issues of increasing concern.

Definition

According to Biomedical Waste (Management and Handling) Rules, 1998 of India "Any waste which 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. The Government of India (notification, 1998) specifies that Hospital Waste Management is a part of hospital hygiene and maintenance activities. This involves management of range of activities, which are mainly engineering functions, such as collection, transportation, operation or treatment of processing systems, and disposal of wastes.

According to World Health Organization (WHO)

- Non-Hazardous Waste - 85% of hospital waste.
- Infectious Waste - 10% of hospital waste.
- Non-Infectious Waste - 5% of hospital wastes but consists of hazardous chemicals like methyl chloride and formaldehyde

Classification of Bio-Medical Waste according to WHO

WHO included 5 categories of classification of hospitals waste for practical purposes.

These include:

a) General non-hazardous waste ;

These can be treated in a manner of domestic waste and has a minimum degree of risk to health. It includes waste generated from sweeping ,mopping/dusting of wards/floors, kitchen waste ,packing ,pare pieces ,waste water and human waste.

b) Sharps: These include pointed or sharp edged instruments in relation to various patient care activities/research. This includes hypodermic needles, needles to tubing ,trocar cannula,blades,glass slides etc.which are in contact with infectious agents

c) Infected waste: These are those waste which contain pathogens in sufficient concentration or qty tht exposure to it could cause disease's his category include cultures and stocks of infectious agents form laboratories, waste from surgeries, autopsies, wastes of isolation wards. this group does not includes sharps.'

d) Chemical or pharmaceutical :These Include various chemicals and pharmaceuticals used in health care organization via formaldehyde photographic chemicals like silver compounds ,hydroquinone,glutaraldehyde ,acetone etc.

Such categories are :

i) Hazardous chemical wastes- these are toxic ,corrosive flammable ,reactive and genotoxic.

ii) Non – hazardous chemical wastes- these are sugars ,amino acds.organic and inorganic salts

iii) Pharmaceutical waste-these are outdated drugs needing disposal.

Other hazardous waste:

i) Radioactive wastes – These are materials used in analytical procedures ,diagnostics aids ,body imaging ,tumor localization. Special precautions of Bhabha Atomic Research Centre(BARC) have to be followed.These substances include:

- Carbon and hydrogen isotopes
- Radio –immunoassay agents
- Radionuclide such as I,I, or Tc
-

ii) Cytotoxic waste: These are those wastes which are toxic to living cells and cause death of cell

Sources of Biomedical Waste

Hospitals produce waste, which is increasing over the years in its amount and type. The hospital waste, in addition to the risk for patients and personnel who handle them also poses a threat to public health and environment.

Major Sources

- Govt. hospitals/private hospitals/nursing homes/ dispensaries.
- Primary health centers.
- Medical colleges and research centers/ paramedic services.
- Veterinary colleges and animal research centers.
- Blood banks/mortuaries/autopsy centers.
- Biotechnology institutions.
- Production units.

Minor Sources

- Physicians/ dentists' clinics
- Animal houses/slaughter houses.
- Blood donation camps.
- Vaccination centers.
- Acupuncturists/psychiatric clinics/cosmetic piercing.
- Funeral services.
- Institutions for disabled persons

Need of biomedical waste management in hospitals

The reasons due to which there is great need of management of hospitals waste such as:

1. Injuries from sharps leading to infection to all categories of hospital personnel and waste handler.
2. Nosocomial infections in patients from poor infection control practices and poor waste management.
3. Risk of infection outside hospital for waste handlers and scavengers and at time general public living in the vicinity of hospitals.
4. Risk associated with hazardous chemicals, drugs to persons handling wastes at all levels.

5. “Disposable” being repacked and sold by unscrupulous elements without even being washed.
6. Drugs which have been disposed of, being repacked and sold off to unsuspecting buyers.
7. Risk of air, water and soil pollution directly due to waste, or due to defective incineration emissions and ash[3].

Biomedical Waste Management Rules

The Government of India as contemplated under Section 6, 8 and 25 of the Environment (Protection) Act, 1986, has made the Biomedical Wastes (Management and Handling) Rules, 1998 which was amended in 2003 and 2011.

The rules are applicable to every institution generating biomedical waste which includes hospitals, nursing homes, clinic, dispensary, veterinary institutions, animal houses, pathological lab, blood bank, the rules are applicable to even handlers.

TABLE-1
Categories Of Biomedical Waste

Option	Waste Category Treatment	Disposal
Category No. 1	**Human Anatomical Waste** (human tissues, organs, body parts)	* incineration@/deep burial
Category No. 2	**Animal waste** (animal tissues, organs, body parts carcasses, bleeding parts, fluid, blood and experimental animals used in research, waste generated by veterinary hospitals colleges, discharge from hospitals, animal houses)	incineration@/deep burial
Category No. 3	**Microbiology and Biotechnology Waste** (wastes from laboratory cultures, stocks or specimens of micro-organisms live or attenuated vaccines, human and animal cell culture used in research and infectious agents from research and industrial laboratories, wastes from production of biological, toxins, dishes and devices used for transfer of cultures	local autoclaving/microwaving /incineration@
Category No. 4	**Waste sharps** (needles, syringes, scalpels, blades, glass, etc. that may cause puncture and cuts. This includes both used and unused sharps)	disinfection (chemical treatment@01/autoclaving/ microwaving and mutilation / shredding##

Category No. 5	**Discarded Medicines and Cytotoxic drugs** (wastes comprising of outdated, contaminated and discarded medicines)	incineration@/destruction and drugs disposal in secured landfills
Category No. 6	**Soiled Waste** (items contaminated with blood, and body fluids including cotton, dressings, soiled plaster casts, lines, beddings, other material contaminated with blood)	incineration@ autoclaving/ microwaving
Category No. 7	**Solid Waste** (wastes generated from disposable items other than the waste sharps such as tubings, catheters, intravenous sets, etc	disinfection by chemical treatment@@ autoclaving/ microwaving and mutilation/shredding##

Category No. 8	**Liquid Waste** (waste generated from laboratory and washing, cleaning, house-keeping and disinfecting activities)	disinfection by chemical treatment@@ and discharge into drains.
Category No. 9	**Incineration Ash** (ash room incineration of any bio-medical waste)	disposal in municipal landfill
Category No. 10	**Chemical Waste** (chemicals used in production of biological, chemicals used in disinfection, as insecticides, etc.)	chemical treatment@@ and discharge into drains for liquids and secured landfill for solids

TABLE-2

COLOUR CODING AND TYPE OF CONTAINER FOR DISPOSAL OF BIO-MEDICAL WASTES

Colour coding	Type of Container	Waste Category	Treatment options as per Schedule I
Yellow	**Plastic bag**	**1,2,3, 6**	**Incineration/Deep burial**
Red	**Disinfected container/ plastic bag**	**3,6,7**	**Autoclaving/Micro waving/Chemical treatment**
Blue/ White translucent	**Plastic bag/Puncture proof container**	**4,7**	**Autoclaving/Micro waving/Chemical treatment and Destruction/Shredding**
Black	**Plastic bag**	**5,9,10**	**Disposal in secured landfill**

Notes:

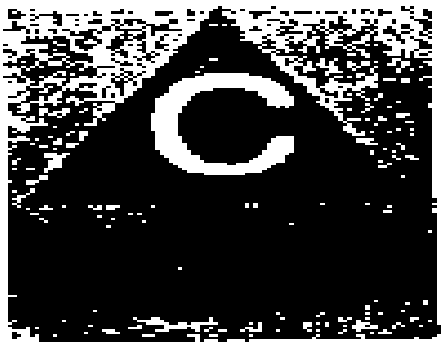
1. Colour coding of waste categories with multiple treatment options as defined in Schedule I, shall be selected depending on treatment option chosen, which shall be as specified in Schedule I.

2. Waste collection bags for waste types needing incineration shall not be made of chlorinated plastics.

3. Categories 8 and 10 (liquid) do not require containers/bags.

4. Category 3 if disinfected locally need not be put in containers/bags

CYTOTOXIC HAZARD SYMBOL



CYTOTOXIC

FIG.1 : **LABEL FOR BIO-MEDICAL WASTE CONTAINERS/BAGS HANDLE WITH CARE**

STAGES of BIOMEDICAL WASTE MANAGEMENT

There is a big network of Health Care Institutions in India. The hospital waste like body parts, organs, tissues, blood and body fluids along with soiled linen, cotton, bandage and plaster casts from infected and contaminated areas are very essential to be properly collected, segregated, stored, transported, treated and disposed of in safe manner to prevent nosocomial or hospital acquired infection.

1: GENERATION

2: SEGREGATION

3: COLLECTION and HANDLING

4: STORAGE

4: TRANSPORTATION

5: TREATMENT OF WASTE

a) Chemical technology

b) Thermal technology

c) Mechanical technology

6: FINAL DISPOSAL Of Waste

Process in BIOMEDICAL WASTE MANAGEMENT

1: Generation: It Is necessary to understand the site of generation of biomedical waste first, in order to understand the process .

2: SEGREGATION:

As per the Biomedical waste (management and handling) rules1998, segregation is defined as **"Separation of different types of waste by sorting"**

Colour coding: The details of colour coding is given in schedule II of biomedical management rules 1998 .

Segregation is the key to success. It will be done at source of generation.

The responsibility of segregation will be with the generators i.e doctors, nurse and technicians.

This have to be in accordance with Schedule II of the notified rules. A simple and clear notice, describing which waste should go to which container and how frequently it has to be routinely removed and to where, is to be pasted on the wall or at a conspicuous place nearest to the container. The notice should be in English, Hindi and the predominant local language. Preferably, it should have drawings correlating the container in appropriate colour with the kind of waste it should contain.

3: <u>COLLECTION and Handling :</u>

- **Bins/ receptacles** Only non-chlorinated plastic collection bags will be used. Liquid waste would not require any bags. All bags /containers will be labelled as per schedule III of biomedical waste rules 1998.
- ***Yellow waste***: Collected in yellow plastic bags, put in yellow bucket.
- **Red waste**: Red bucket lined with red plastic liners, stored in red drums with plastic liners.
- ***Green waste***: Green bucket lined with green plastic liners. Stored in green drums with plastic liners.
- **Blue *waste***: Blue bucket stored in blue drums with blue plastic liners.
- ***White waste***: White drum with 1% hypochlorite solution.
- ***Sharps***: Metallic- Blue pearl pet with 1% hypochlorite solution. Needles to be mutilated by needle destroyed before putting them in bucket.
- ***Broken glasses***: Blue Pearl pet with 1% hypochlorite solutions

Handling of Disposable items

- Disposable like the gloves, syringes, needles, I.V. bottles, catheters etc will be shredded, cut or mutilated. This will ensure that the items are not being recycled or reused by rag pickers.
- Needles, which are the major portion of sharps will be mutilated by needle cutter and then put in 1% hypochlorite solution. The principle of three ‘D’s will be followed as under
- Distort
- Disinfect
- Destroy

4:STORAGE

According to biomedical waste management (Management sand Handling) Rules 1998, storage means "the holding of biomedical waste for such period of time ,at the end of which waste is treated and disposed off"

Storage of waste is necessary at two points :

(i) at the point of generation and
(ii) common storage for the total waste inside a health care organisation.

For smaller units, however, the common storage area may not be possible. Systematic segregated storage is the most important step in the waste control programme of the health care establishment. For ease of identification and handling it is necessary to use colour coding, i.e., use of specific coloured container with liner / sealed container (for sharps) for particular wastes. It must be remembered that according to the Rules, untreated waste should not be stored beyond a period of 48 hours.

Segregated Storage in Separate Containers (at the Point of Generation)

Each category of waste (according to treatment options mentioned in Schedule I of the rules) has to be kept segregated in a proper container or bag as prescribe d in Scheduled II as the case may be. Such container / bag should have the following property :

- It must be sturdy enough to contain the designed maximum volume and weight of the waste without any damage.
- It should be without any puncture/leakage.
- The container should have a cover, preferably operated by foot. If plastic bags are to be used, they have to be securely fitted within a container in such a manner that they stay in place during opening and closing of the lid and can also be removed without difficulty.
- The sharps must be stored in puncture proof sharps containers. But before putting them in the containers, they must be mutilated by a needle cutter, placed in the department/ward itself.
- The bags/containers should not be filled more than 3/4th capacity.

Certification

- When a bag or container is sealed, appropriate label (s) clearly indicating the following information (as per Schedule IV of the Rules) has to be attached. A water-proof marker pen should be used for writing.

- They should be labelled with the 'Biohazard' or 'cytotoxic' symbol as the case may be according to Schedule III of the rules.

- The containers should bear the name of the department/laboratory from where the waste has been generated so that in case of a problem or accident, the nature of the waste can be traced back quickly and correctly for proper remediation and if necessary, the responsibility can be fixed.

- The containers should also be labelled with the date, name and signature of the person responsible. This would generate greater accountability.

- The label should contain the name, address, phone/fax nos. of the sender as well as the receiver

- It should also contain name, address and phone/fax nos. of the person who is to be contacted in case of an emergency.

Common/Intermediate Storage Area

Collection room(s)/intermediate storage area where the waste packets/bags are collected before they are finally taken/transported to the treatment/disposal site are necessary for large hospitals having a number of departments, laboratories, OTs, wards etc. This is all the more important when the waste is to be taken outside the premises.

Two rooms - one for the **general** and the other for **the hazardous waste** are preferable (, 5th point).

In case of shortage of rooms, the general waste (non-hazardous) can be directly stored outside in dumper containers with lids of suitable size.

Arrangement for separate receptacles in the storage area with prominent display of colour code on the wall nearest to the receptacles has to be made. When waste carrying carts/containers arrive at this area, they have to be systematically put in the relevant receptacle/designated area. It should have a capacity of minimum two days storage. It should be removed daily for dispose.

5: TRANSPORTATION:

Transportation of Hospital Waste : Waste disposal is a multi faced activity in which different stages i.e. GENERATION ,SEGREGATION ,COLLECTION ,TRANSPORTATION,TREATMENT and FINAL DISPOSAL are highly interdependent ,both technically as well as organizationally .

Types of transport:

a**)Intramural transport(Internal):**

This refers to transport of waste from the point of generation, segregation, collection, and storage in the wards, to the point outside the building premises where it is kept pending transport to the actual site of disposal. The vehicle used includes : pushcarts, wheelbarrow and trolley .

b**)Extra mural transport(External**):

This refers to the transport of waste from a central collection point outside a building to a site of final disposal. Cycle rickshaw, garbage van /lorry are the vehicle used

.

6 :WASTE TREATMENT AND DISPOSAL :

Treatment is a term used for those process that modify waste in some way before it is finally disposed of ,with the main objective of decontaminating it by some means ,so that following objectives are achieved.

a) Making it free from pathogenic microorganisms

b)To reduce the volume of the waste

c) To make it unrecognized and acceptable for final disposal.

According to Biomedical waste (management and handling)rules 1998 treatment means "a method ,technique or process designed to change the physical ,chemical or biological characteristics or composition of nay biomedical waste so as to render such waste non –hazardous to health and environment"

Different methods have been developed for rendering bio-medical waste environmentally innocuous and aesthetically acceptable but all of them are not suitable for our condition. The 'Bio-Medical Waste (Management & Handling) Rules, 1998' has elaborately mentioned the recommended treatment and disposal

options according to the 10 different categories of waste generated in health care establishments in Schedule I of the rules (Annexure 7.2). Standards for the treatment technologies are given in Schedule V of the Rules, which must be complied with.

(6) FINAL DISPOSAL OF THE HOSPITAL WASTE:

After the various waste has been treated by some methodology like incineration /autoclaving the waste becomes non infectious and non hazardous. Their disposal is can be by following means:

Disposal of general non hazardous solid waste:

These are non hazardous in nature and are same like house hold/domestic wastes. Hence these waste if properly segregated from infectious waste scan be handled over to the municipal authority for disposal by them.

Methods available are

- For small quantity of waste:
- **Land filling:** This is the most satisfactory method ,the site selection of such a land should be done carefully and must be way from cities and towns ,dwelling units and public view
- It should be covered with at least 0.5 meters of suitable cover material land filling can be done by

Trench method: trenches 2-3 metre deep and 3-10 metre wide are made treated waste preferably compacted is filled up to 2 metres depth and is covered with excavated earth.

Ramp method: In this method the waste is dumped in the form of a ramp. This method is well suited where the terrain is moderately sloping and some excavation has been done to obtain covering material.

Use of pits: This method is suitable for small institution .in this method a small pit of dimension 2m*2m is dug of adequate depth. The waste is dropped and the pit is covered with a 30 cm thick layer of earth .contents gets decomposed within 4-6 months.

Disposal of waste water and liquid waste:

Waste water and liquid waste from kitchens, cafeteria and laundry should be drained into the municipal waste /civic drains. Generally cyto-toxic and hazardous wastes are not discharged into the sewers without treatment

One of the best parameter to determine cytotoxic waste in hospitals is bioassay test, Depending on the size and location of the hospital the following methods of disposal of liquid waste are used:

a) Discharge into sewers
b) Soakage pits

Disposal of sharps:

Although sharps comprise a relatively small proportion if hazardous waste general in any hospital, they have the maximum potential for inflicting needle stick beyond doubt that this type of waste needs maximum precaution and care. Sharps are stored in the areas of generation in puncture proof containers.
Before storing them the needle are destroyed by a needle destroyer, which can be manual or electrical. this should be disinfected in 5polar bleach solution for 30 mint in the ward and sent for disposal in specialized landfills.
The used syringes disposal system is also an innovative technology which causes simultaneous melting g and sterilization of them into harmless plastic blocks which encloses the needles. The volume also reduces to $1/5^{th}$ the pre-treatment volume.

Disposal of infectious waste :

This is first treated by any of the methods described earlier. To change into an innocuous waste .this can b disposed off as a general waste.

After ensuring that the radioactive waste has completed its decay period, the radioactive waste can be disposed of as normal waste after monitoring its residual activity. All the radiation symbols, if any should be removed from the radioactive waste packages (plastic bags) before disposal as normal waste.
The record of disposal should be properly maintained.

BIOMEDICAL WASTE MANAGEMENT PROCESS IN SADAR HOSPITAL NAWADA BIHAR

1:GENERATION:

POTENTIAL AREAS OF WASTE GENERATION IN SADAR HOSPITAL ARE:

1: EMERGENCY DEPARTMENT
2: LABOUR ROOM
3: SURGICAL WARD
4: PEADIATRIC WARD
5: ORTHOPEADIC WARD
6: GYNEC. WARD
7: OPERATION THEATRES OF GYNEC. WARD AND GENERAL O.T
8: PATHOLOGY LAB
9: BLOOD BANKS
10: DRESSING AND PLASTER ROOM
11: HIV CENTRE
12: OPD

2:SEGREGTAION :

At the point of generation of wastes absence of protocol of colour coding rule and guidelines and HCW they don't have any idea about segregation of waste.

TABLE-3

VARIOUS KINDS OF WASTE GENERATED IS SEGREGATED ON THE BASIS OF FOLLWING GUIDELINES.

TYPES	COLLECTION	DISPOSAL
1)WASTE SHARPS	**Only needle is collected in transparent container with biohazard symbol**	**OUTSOURCED TO SYNERGY**
2)SOILED WASTE	**YELLOW BAG**	**OUTSOURCED TO SYNERGY**
3) ANATOMICAL WASTE	**YELLOW BAG**	**OUTSOURCED TO SYNERGY**
4)LIQUID WASTE	**POURED DOWN TO DRAIN**	**GOES TO THE MAIN DRAINAGE LINES**
5)GENERAL WASTE	**COLLECTED IN NORMAL DUSTBIN**	**GOES TO NAGAR NIGAM**

Note: there is no radioactive waste generated by the hospital.

3:COLLECTION AND HANDLING:

1)SOLID WASTE:

Bins/ receptacles

Only non-chlorinated plastic collection bags are to be used.

- *Yellow waste*: Collected in yellow plastic bags, put in yellow bucket.
- Red waste: Red bucket lined with red plastic liners, stored in red drums with plastic liners.
- Black bags: for non hazardous general waste and expired cytotoxic drugs

3) FOR CYTOTOXIC DRUGS AND EXPIRED DRUGS;"Are sent to pharmacy either for disposal or for exchange to the manufacturer itself .

4) FOR LIQUID WASTE :

ALL drained into sewage pipe lines connecting wards and different departments that goes to SEWAGE TREATMENT PLANT for treatment

Waste is COLLECTED THREE TIMES A DAY MORNING: 6:30 TO7;30 am
2:30 to 3:30 pm ,
7:30 to 8:30

Handling of Disposable items

- Disposable like the gloves, syringes, needles, I.V. bottles, catheters etc items are not be shredded, cut or mutilated.
- I.V. Bottles are collected by rag pickers.
- Needles, which are the major portion of sharps will be mutilated by needle cutter and then put in 1% hypochlorite solution.
- Placenta is collected on yellow bag.

4: STORAGE

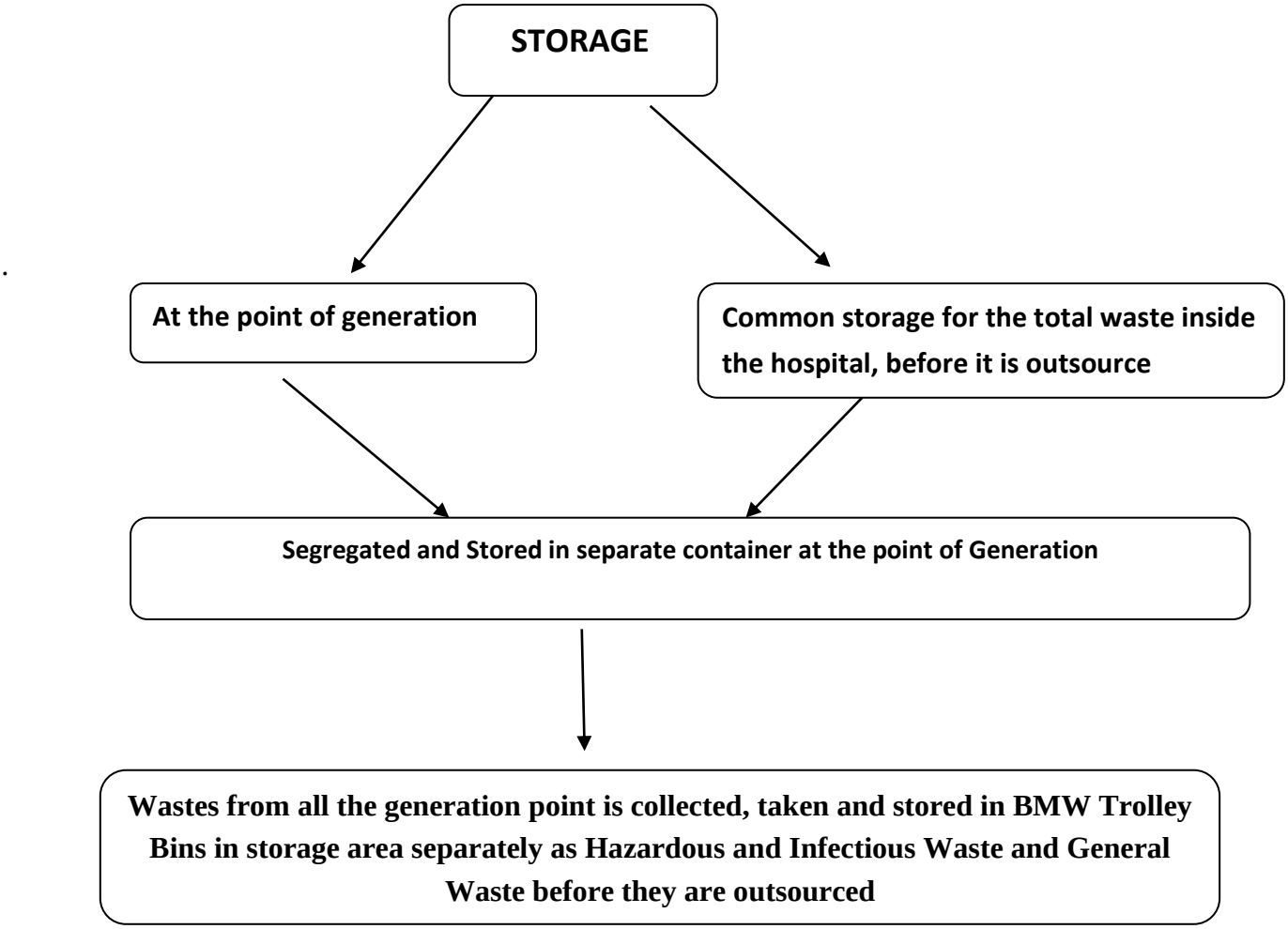


Fig.2 : Storage practices followed in Sadar Hospital Nawada

Hazardous and Infectious Waste is stored for a maximum of 24 hrs but General Waste of Hospital it takes long time in Transportation.

5: TRANSPORTATION

Two types of transportation of hospital waste is done in Sadar Hospital Nawada.

Intramural transport (internal) through trolleys

extramural transport (External) through lorry

5: TREATMENT AND DISPOSAL

TABLE-4

➢ Infectious waste:	➢ Outsourced to SYNERGY WASTE MANAGEMENT
• Liquid waste:	➢ Goes to sewage pipe line
• Cytotoxic drugs	➢ Send to pharmacy department either for disposal or exchange
• Hazardous material	➢ outsourced to SYNERGY WASTE MANAGEMENT

REVIEW OF LITRETURE

A cross sectional study in 30 hospitals with more than 30 beds minimum were randomly selected from Sabarkantha district, Gujarat With the objective of assessing the level of awareness about the various aspects of biomedical waste and disposal practices by the medical practitioners. The doctors and auxiliary staff of those 30 hospitals were the study population. There was no effective waste segregation, collection, transportation and disposal system at any hospital in the district. Findings revealed that there is an immediate and urgent need to train and educate all doctors and the staff to adopt an effective waste management practices.[1]

Another study with objective of assessing knowledge, attitude, and practices of doctors, nurses, laboratory technicians, and sanitary staff regarding biomedical waste management was conducted among hospitals (bed capacity >100) of Allahabad city including doctors (75), nurses (60), laboratory technicians (78), and sanitary staff (70). Doctors, nurses, and laboratory technicians have better knowledge than sanitary staff regarding biomedical waste management. Knowledge regarding the colour coding and waste segregation at source was found to be better among nurses and laboratory staff as compared to doctors. The importance of training regarding biomedical waste management needs emphasis.[2]

A study conducted in 2001 by CEE, New Delhi; indicated an implementation deficit. To gauge the present situation, a survey was undertaken during 2005-2006. A systematic analysis of current biomedical waste management practices in smaller nursing homes and hospitals in Delhi was carried out. The survey results show that there is a marked improvement in the segregation practices of biomedical waste in small private hospitals and nursing homes. This paper discusses the relevant data indicative of current practices of healthcare waste management in the nursing homes and small healthcare facilities in Delhi.[3]

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1 Management of bio-medical waste: awareness and practices in a district of Gujarat

2 Knowledge, Attitude, and Practices about Biomedical Waste Management among Healthcare Personnel: A Cross-sectional Study

3 Biomedical waste management in nursing homes and smaller hospitals in Delhi

RATIONALE OF THE STUDY

Biomedical waste management is receiving greater attention due to recent regulations of the Biomedical Wastes Management & Handling Rules, 1998. Inadequate management of biomedical waste can be associated with risks of healthcare workers, patients, communities and their environment. The present study was conducted to assess the quantities and proportions of different constituents of wastes, their handling, treatment and disposal methods in different health-care settings.

Hospital waste management is a part of hospital hygiene and maintenance activities. In fact only 10-15% of hospital waste i.e. “Biomedical waste” is hazardous. But when hazardous waste is not segregated at the source of generation and mixed with non-hazardous waste, then 100% waste becomes hazardous. The question then arises that what is the need or rationale for spending so many resources in terms of money, man power, material and machine for management of hospital waste? The reasons are:

1. Injuries from sharps leading to infection to all categories of hospital personnel and waste handler.
2. Nosocomial infections in patients from poor infection control practices and poor waste management.
3. Risk of infection outside hospital for waste handlers and scavengers and at time general public living in the vicinity of hospitals.
4. Risk associated with hazardous chemicals, drugs to persons handling wastes at all levels.
5. “Disposable” being repacked and sold by unscrupulous elements without even being washed.
6. Drugs which have been disposed of, being repacked and sold off to unsuspecting buyers.
7. Risk of air, water and soil pollution directly due to waste, or due to defective incineration emissions and ash.

OBJECTIVE OF THE STUDY

General Objective

To assess the Biomedical Waste Management Practices in District Hospital Nawada, Bihar.

Specific Objective

- To study the BIOMEDICAL WASTE MANAGEMENT process and practices followed in District Hospital Nawada, Bihar.
- To recommend possible remedial measures**.**

METHODOLOGY

Study Design: Cross-Sectional and Descriptive Study

Study Area: District Hospital Nawada, Bihar

Sample Selection: Convenient sampling was done in order to obtain necessary information.

Study Tools: Questionnaire

Duration of Study: April 2013

Technique:

1. In-depth interview and informal discussion with the staff nurses and housekeeping staffs
2. Observations

FINDINGS AND DATA INTERPRETATION

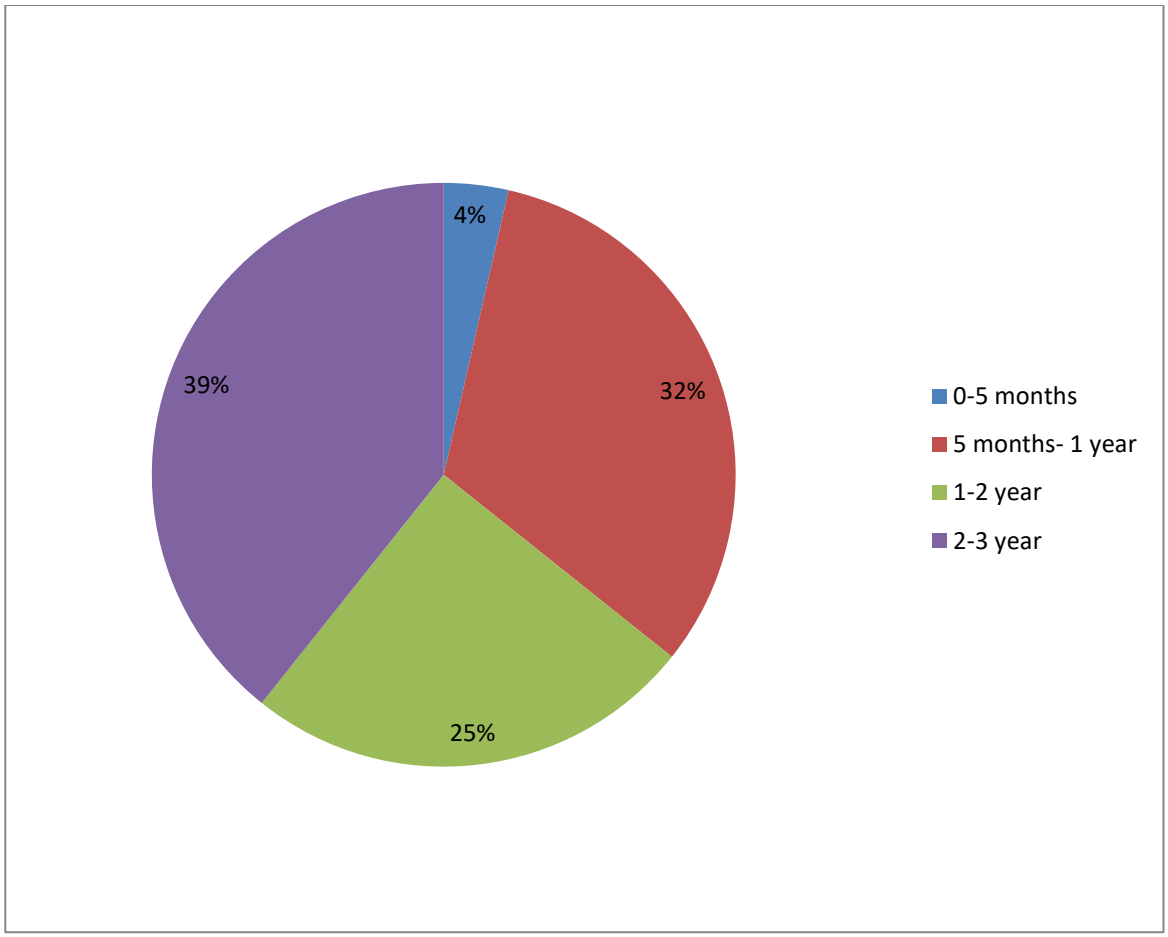

FIG. 3 : This graph showing duration of job of Nurses and Housekeeping Staffs working in the Hospital.

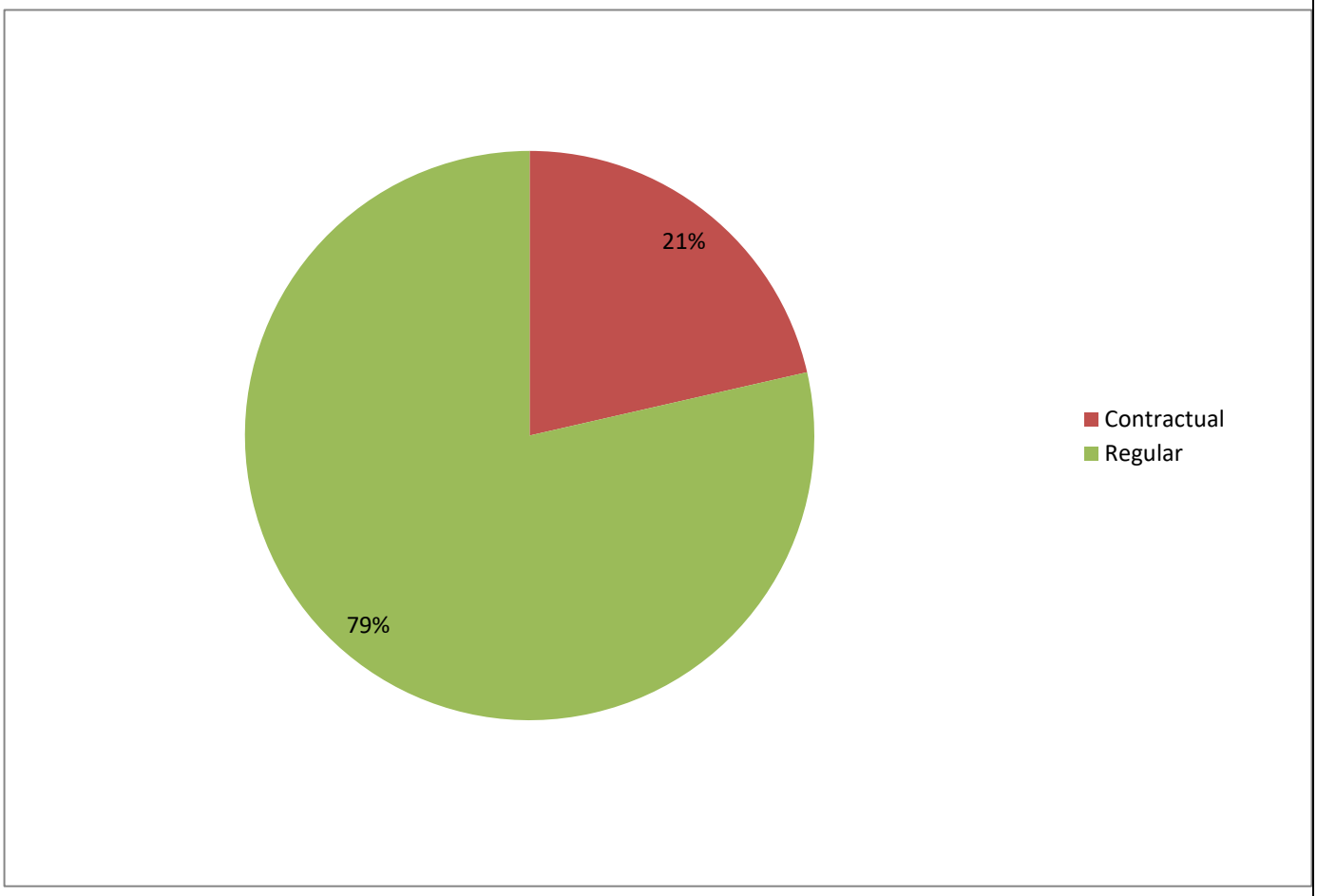

Fig.4 : This graph showing type of job of Nurses and Housekeeping Staffs working in the Hospital.

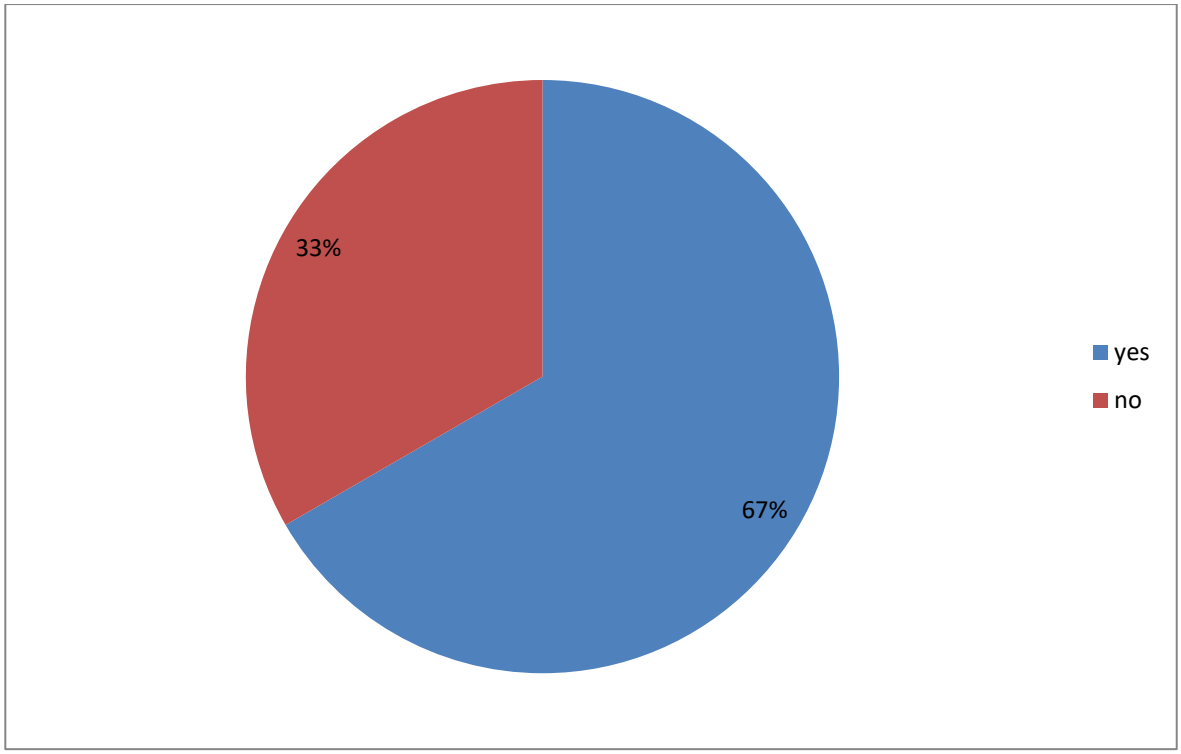

Fig.5 : This graph showing the awareness level of Nurses and Housekeeping staffs about the word Bio-Medical Waste Management.

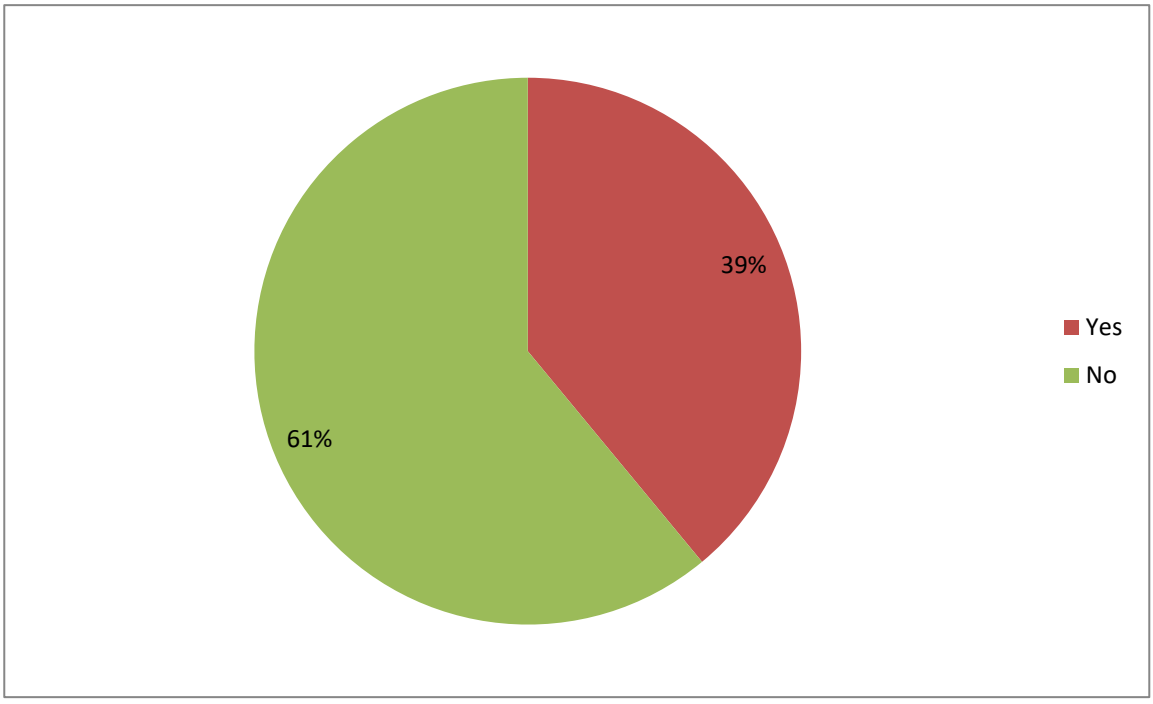

Fig.6 : This graph showing how many Nurses and Housekeeping staffs had received the training about Bio-medical waste Management.

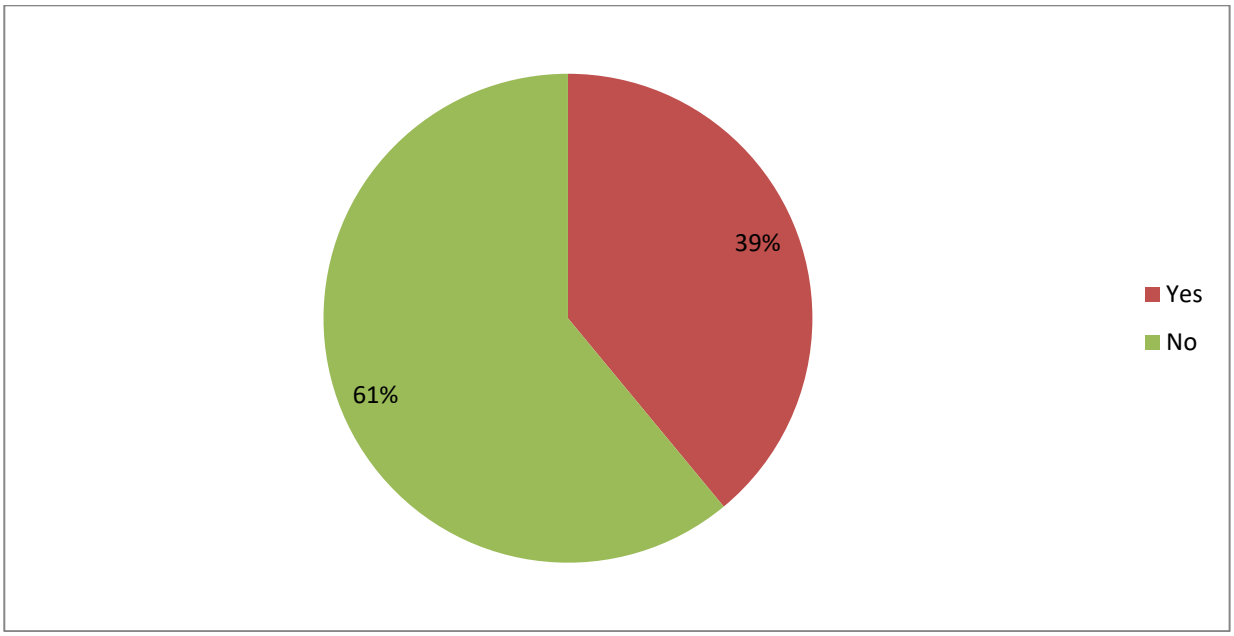

Fig. 7 :This graph shows the percentage of the staffs who knows to handle BMW.

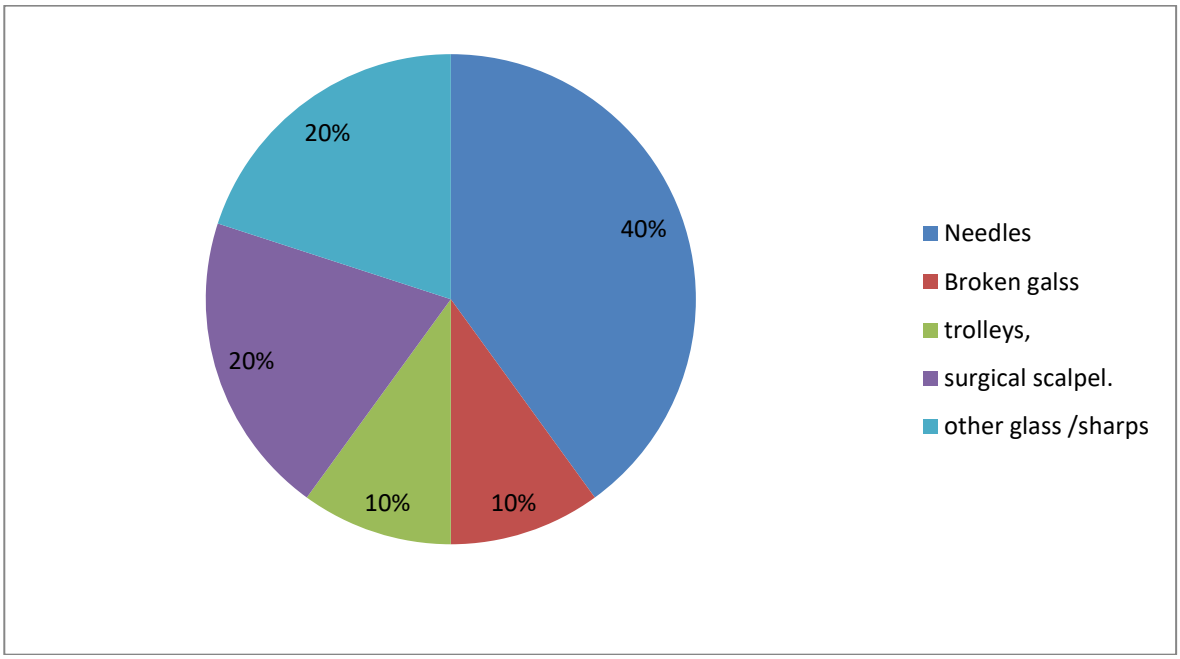

Fig.8 : This graph shows percentage of injury which occurs due to Needles, Broken Glass, trolleys, Surgical Scalpel and other glass or sharps.

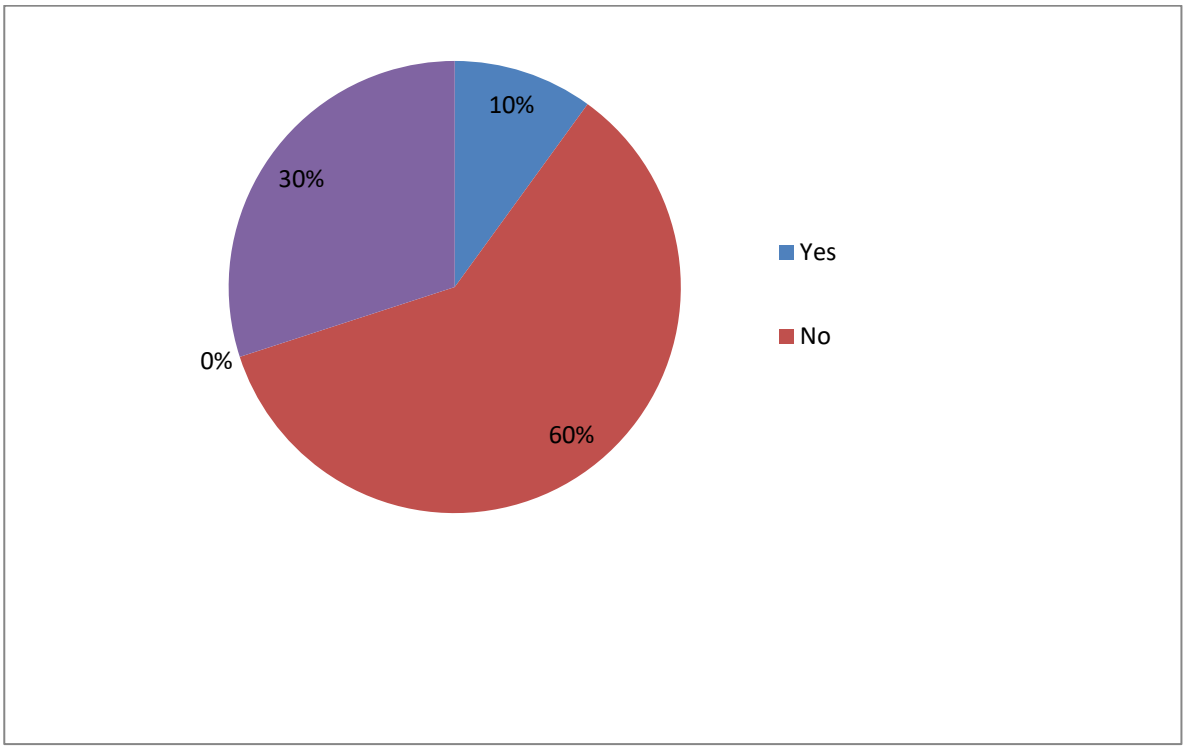

FIG.9 : This graph shows immunization policy for the workers who are handling BMW.

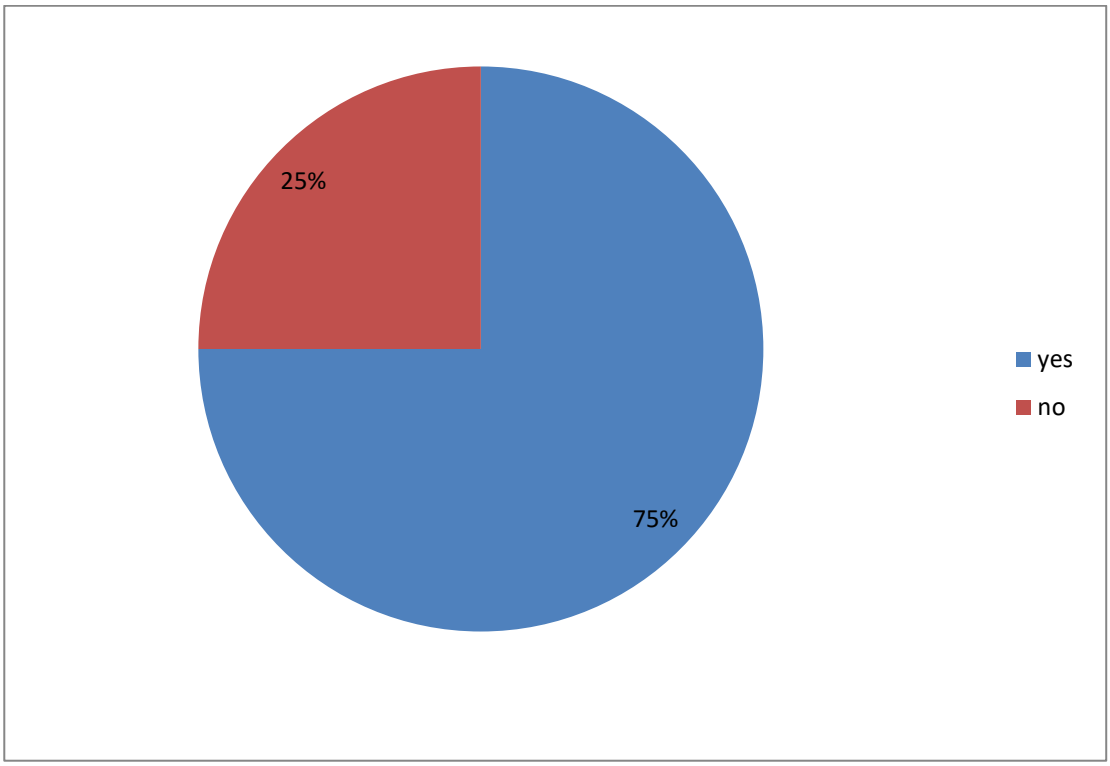

FIG.10 : This graph shows the percentage of awareness level about Needle Stick Injury.

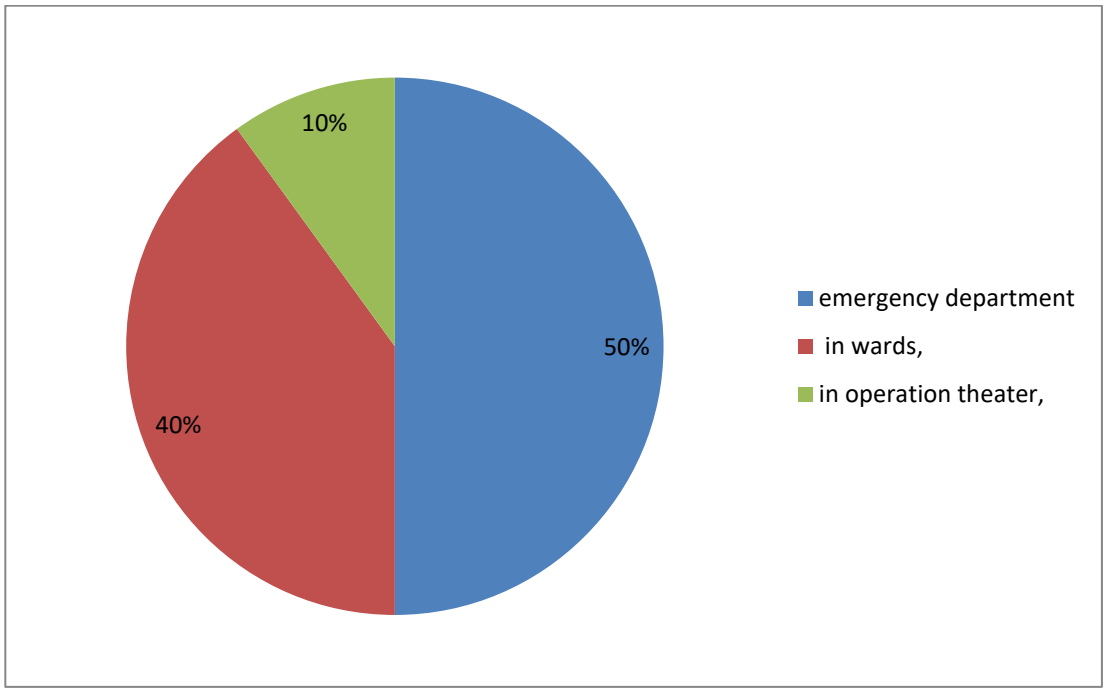

Fig.11 This graph shows the percentage of Needle Stick Injury which occurred in Emergency Dept., wards and O.T

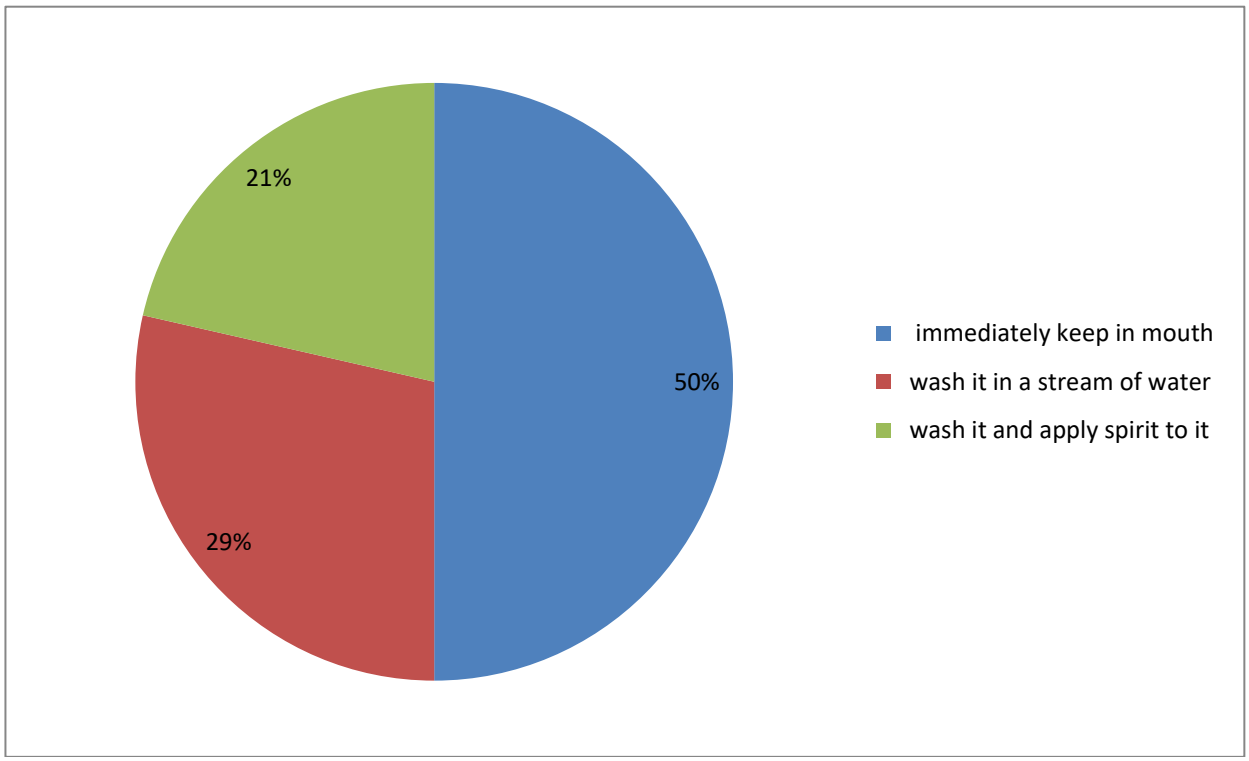

Fig.12 : This graph shows the practices followed by HCW after Needle Stick Injury.

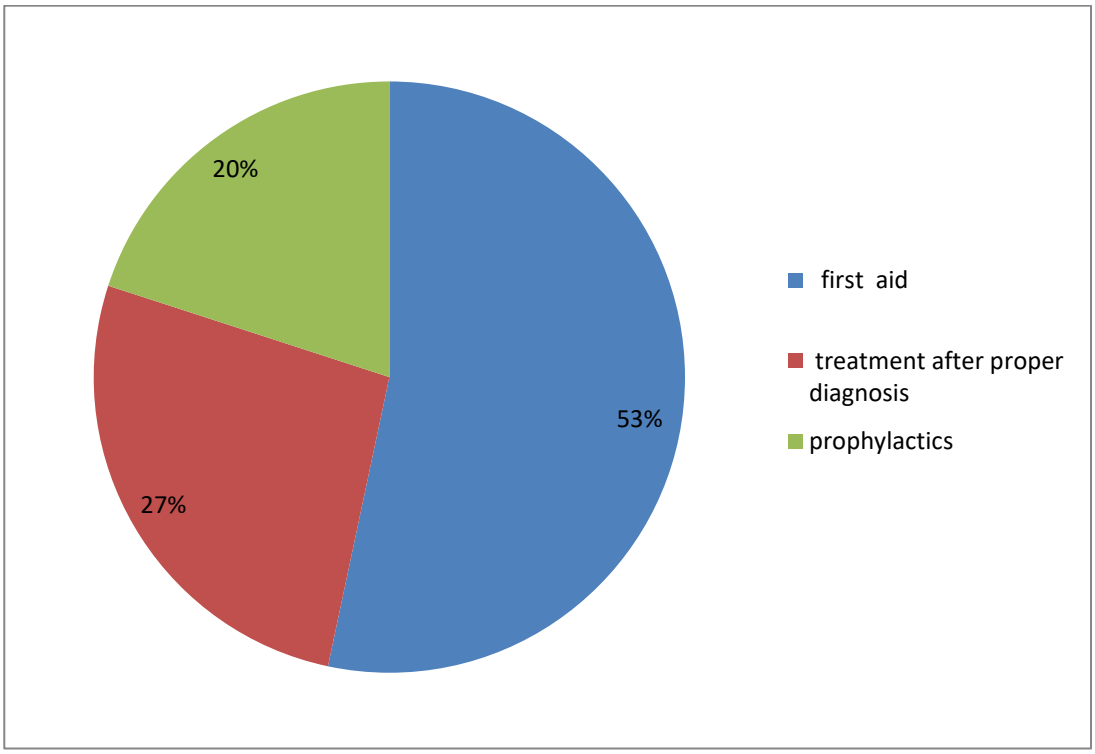

Fig.13: This graph shows the type of treatment received by the HCW after Needle Stick Injury.

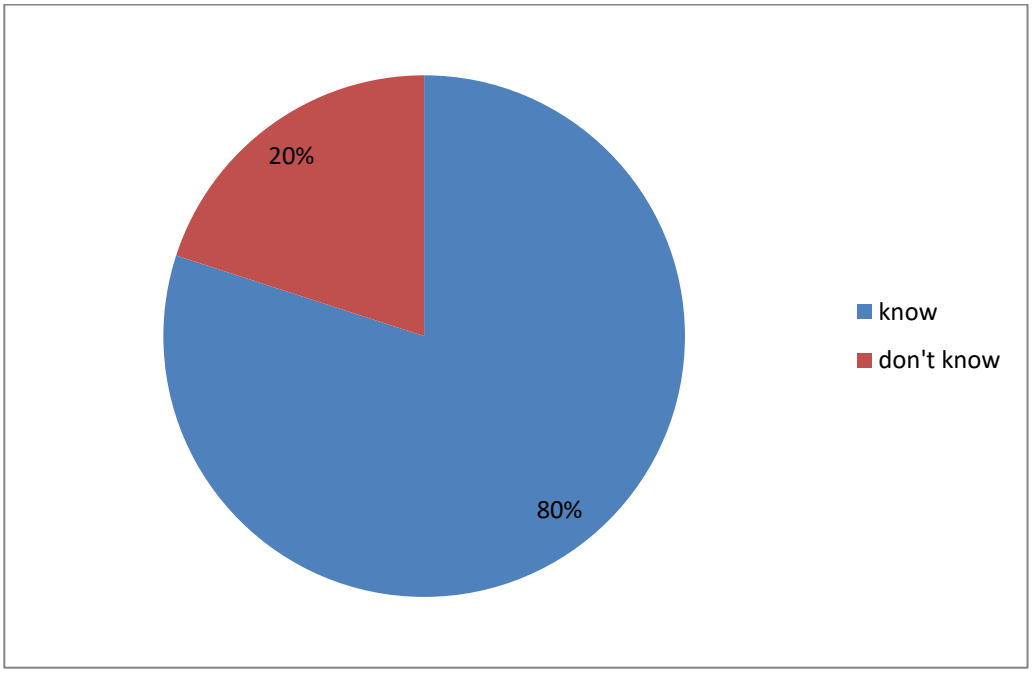

Fig.14 : This graph shows the awareness level of HCW about where Bio- medical waste is being outsourced.

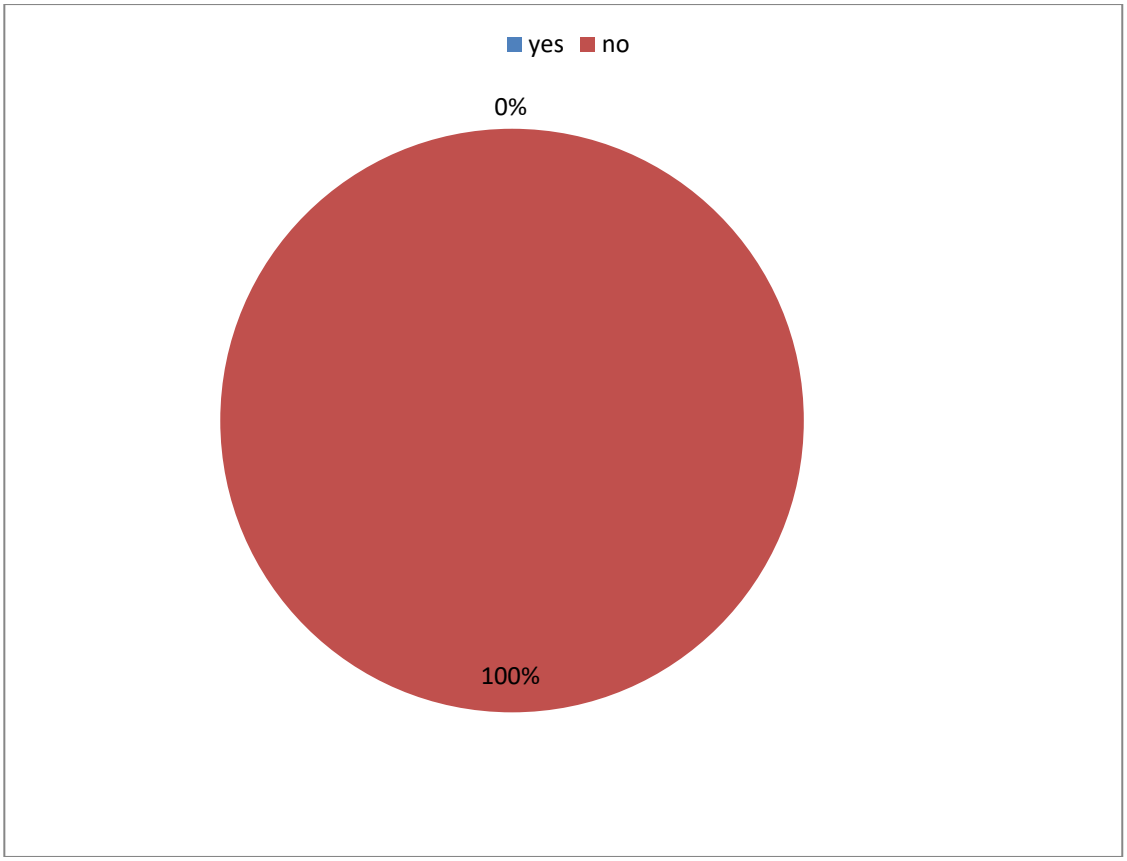

Fig.15 : This graph shows practices followed by Housekeeping Staffs during Blood Spills.

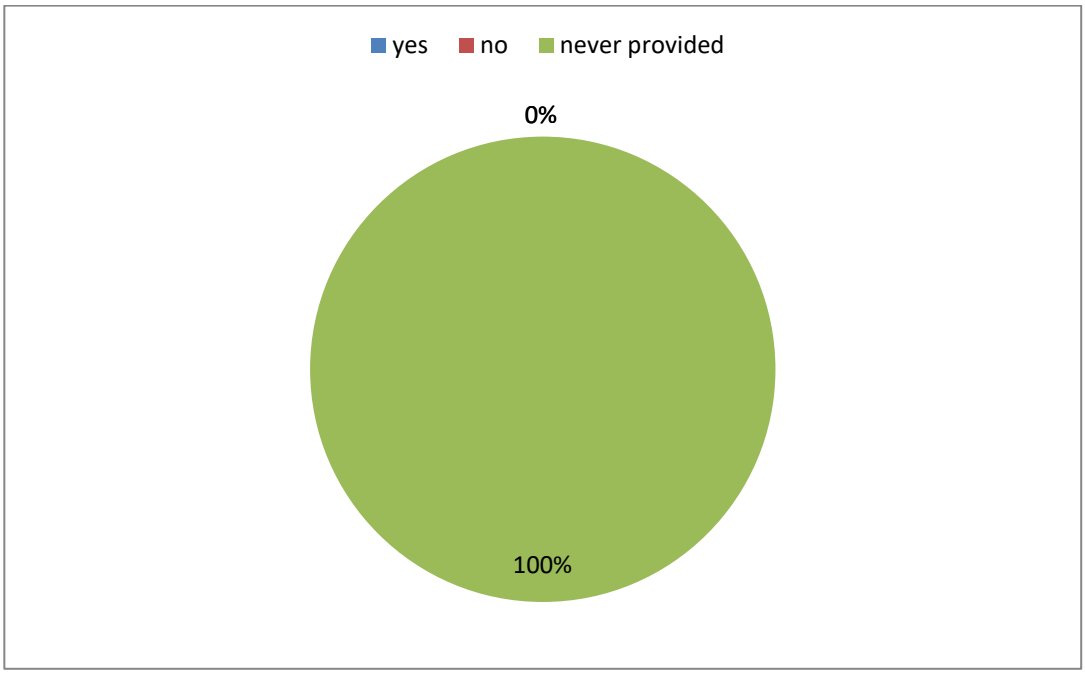

FIG.16 : This graph shows the use of PPE by the HCW during handling of BMW.

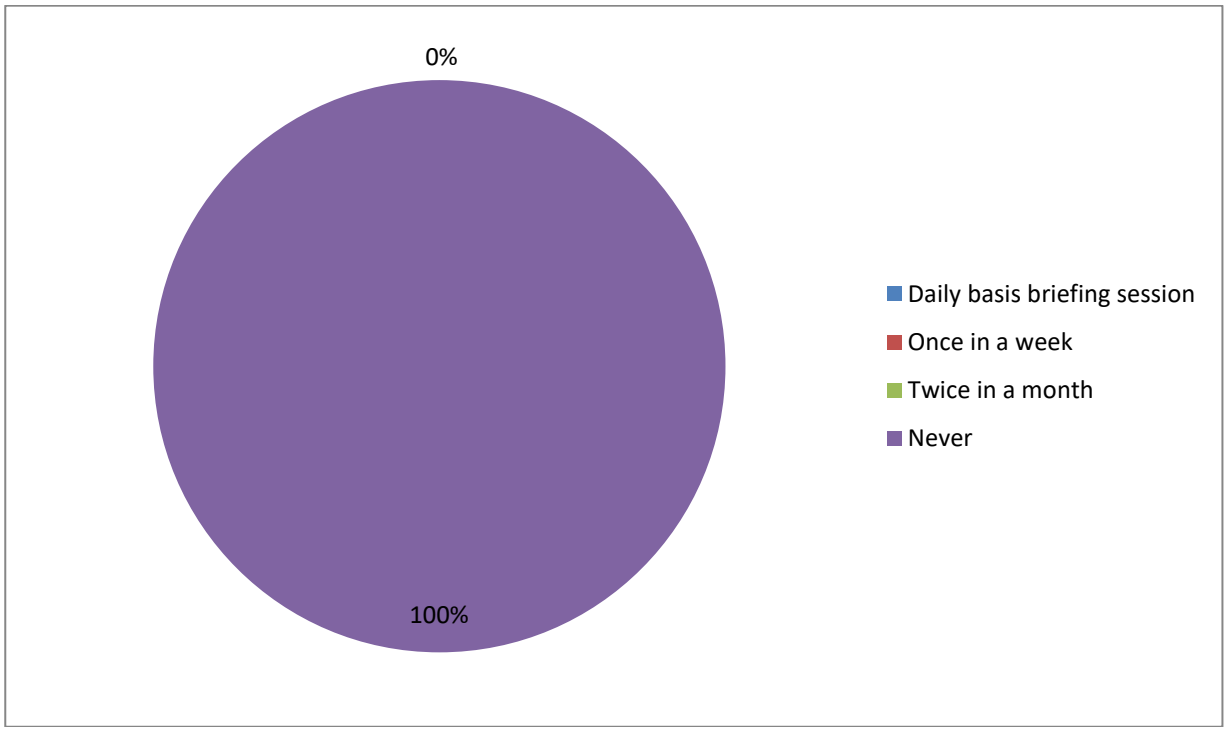

Fig.17 : This graph shows the mode of training session for BMW to train the Health Care Workers.

DISCUSSION

This was a cross sectional hospital based study conducted in SADAR HOSPITAL NAWADA..Most of the departments of the hospital were studied. Study subjects were selected conveniently, which included, nurses, housekeeping staff and others then they were interviewed by administering a structured questionnaire attached in appendices ,to check the awareness on BMW management in hospital staff.

Certain deficiencies in the knowledge of various categories of hospital employees were identified.

- Most of the housekeeping staff was mostly unaware BIO MEDICAL WASTE MANAGEMENT.
- Most of the staff was unaware whether a BMW management plan existed or not whereas it was known to few.
- Whole of the staff that was interviewed was aware of the fact that the waste should be segregated.
- Talking of labelling of the waste, most of the staff refused that the waste generated was not labeled at all.
- Staff was very much aware of the fact that improper management of BMW leads to health hazards except some of the housekeeping staff.
- Most of the doctors and nurses were aware of the fact that which material should go in which colour dustbin while a mixed response was seen among housekeeping and other staff.
- Staff was generally aware of the biomedical hazard symbol but most of the staff said that they weren't aware of any training program on BMW management.
- Lack of knowledge about Bio Medical Waste Management Practices among the HCW.
- There were no separate protocols for immunization of staffs.
- No signs/ posters are there in the hospital premises for segregation, Colour Coding and handling of BMW.
- Most of the house keeping staffs doesn't have knowledge about the segregation of waste.

Safe and effective management of waste is not only a legal necessity but also a social responsibility and every employee of the hospital should understand this and should attend training programmes conducting by the hospital on hospital waste management. The study shows that most of the healthcare personnel did not attend any training on hospital waste management. During training programme 100% attendance of the hospital employees should be there to improve the waste management plan in the hospital.

Conclusion and Recommendations

CONCLUSION

Medical wastes pose significant impact on health and the environment. Especially in a developing country like India, may be because of its huge population and pollution level when taken into account as such. However, from this study it can be said that though the management of waste is done in very appreciable level still there is an urgent need for raising awareness and education on medical waste issue for the staff.

Proper waste management strategy is needed to ensure health and environmental safety. Proper handling, treatment and disposal of biomedical waste play a vital role in hospital infection control programme. Objectives of BMW (Biomedical waste) management mainly involves preventing transmission of disease from patient to patient, from patient to health worker and vice versa,

Recommendations

- Hospital should implement the training program for Bio Medical Waste Management on a regular basis. These training sessions should not become merely a one-time activity but should be a continuous process.
- Awareness materials including hoardings, wall writing stickers etc should be provided in the hospital.
- Special training has to be given for the personnel who are handling the waste directly on regular basis like nursing staffs and housekeeping staffs.
- Policy of Waste Management should be strictly followed.
- Supervisor should be responsible for the monitoring of the staff to ensure that biomedical waste management rules are strictly followed in the hospital**.**
- Hospital generating Bio-medical waste shall strictly ensure segregation, color coding and other provisions of Bio-medical waste (Management & Handling) rules, 1998.
- Proper training and personal safety equipment / accessories should be provided to waste handling staff.
- There should be a separate BIOMEDICAL WASTE MANAGEMENT COMMITTEE for handling everything regarding biomedical waste management.
- A supervisor should be always present at the storage site when the waste is being outsourced.
- There should be strict protocol for reporting any negligence on part of any heath care staff.

REFRENCES

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Hospital Waste- An Environmental Hazard and Its Management *By: Hem Chandra*

BIOMEDICAL WASTE MANAGEMNT IN INDIAN CONTEXT (Dr. Saurabh Sikka)

Management of bio-medical waste: awareness and practices in a district of Gujarat.

Notification -Bio-Medical Waste (Management and Handling Rules) 2011 (Government of India, Ministry of Environment and Forest)

ANNEXURE -11

AWARENESS AMONG THE HOUSE KEEPING AND NURSES REGARDING BIOMEDICAL WASTE MANAGEMENT:

Sample questionnaire:

1: How long have you been working in this organization?

a) 0-5 months
b) 5 months- 1 year
c) 1-2 year
d) 2-3 year

2: Is your job contractual?

a)yes
b) no

3:Do you understand the meaning of the word "BIOMEDICAL WASTE" ?

a) Yes
b) No

4: Have you been given training about Biomedical waste management handling and collection?

a) Yes
b) No

5. Do you know how to handle BMW?

a. YES
b. NO

6. Devices by which injury occur most.

a) Needles
b) Broken glass
c) trolleys,
d) surgical scalpel.
e) other glass /sharps

7: Was any immunization initiative taken by ORGANISATION FOR YOUR protection at the work place?

a) Yes
b) No
c) When at the commencement of job
d) after accident

8: Do you understand the meaning of the world NEEDLE STICK INJURY?

a) Yes
b) No

9: Where do you think maximum Needle Stick Injury takes place?

a) emergency department

b) in wards,
c) in operation theatre,

10. What would you first do in case of a needle prick?
a) immediately keep in mouth
b) wash it in a stream of water
c) wash it and apply spirit to it

11: What type of treatment do you receive?
a) first aid
b) treatment after proper diagnosis
c) prophylactics

12: Do you know where the waste is outsourced?
a) know
b) don't know

13: Do you know the process of handling blood spill case?
a) Yes
b) No

14: Do you use gloves, face mask and shoes during handling of waste?
a) Yes
b) No
c) Never provided

15: How many times training is given to you?
a) Daily basis briefing session
b) Once in a week
c) Twice in a month
d) Never