AWARENESS LEVEL ABOUT BIO-MEDICAL WASTE MANAGEMENT AMONGST THE STAFF AT PARK HOSPITAL

A dissertation submitted in partial fulfillment of the requirements

for the award of

Post-Graduate Diploma in Health and Hospital Management

by

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PG/11/024

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New Delhi -110075

Feb- May, 2013

Park Hospital
(A Unit of Park Medicentre Pvt. Ltd.)
250 Bedded Superspecialty Hospital

Certificate of Internship Completion

Date: .....

TO WHOM IT MAY CONCERN

This is to certify that **Ms. Gaganbir Kaur** has successfully completed her 3 months internship in our organization from February 11th, 2013 to May 11th, 2013. During this intern she has worked on project titled "**AWARENESS LEVEL ABOUT BIO-MEDICAL WASTE MANAGEMENT AMONGST THE STAFF IN THE HOSPITAL**" under the guidance of me and my team at Park Hospital, Gurgaon

We wish her good luck for her future assignments.

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Certificate of Approval

The following dissertation titled **"TO ASSESS THE AWARENESS LEVEL ABOUT BIOMEDICAL WASTE MANAGEMENT AMONGST THE STAFF IN THE HOSPITAL"** 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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DR. BRIJENDER SINGH DHILLON	1/5/13

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Certificate from Dissertation Advisory Committee

This is to certify that **Ms.GaganbirKaur**, a graduate student of the **Post- Graduate Diploma in Health and Hospital Management**, has worked under our guidance and supervision. She is submitting this dissertation titled " **AWARENESS LEVEL ABOUT BIO-MEDICAL WASTE MANAGEMENT AMONGST THE STAFF IN THE HOSPITAL** " in partial fulfillment of the requirements for the award of the **Post- Graduate Diploma in Health and Hospital Management**.

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

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Area of Dissertation: Operations

Attendance: Regular

Objectives achieved: yes

Deliverables: Assigned tasks fulfilled

Strengths: very good working and intelligent

Suggestions for Improvement: There is always a scope for learning new things.

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ABSTRACT

Bio-medical waste is any waste generated in the process of diagnosis, treatment or Immunization of human beings or animals, research activities, production or testing of biological components.

Rationale: It's a known fact that only 15 % of waste from hospital is hazardous so the question arises what is the need of spending so much resources on having a proper BMW protocol, that is because improper management of waste can lead to:

Injuries from sharps, Nosocomial infection to patients and pollution.

Objectives:

General objective :To assess the awareness level amongst the hospital staff regarding biomedical waste management policies and bio-medical waste management practices in the hospital

Specific objectives

- To determine the awareness level on bio-medical waste management rules and practices in the hospital among the staff
- To recommend possible remedial measures

Methodology:

- ***Study design*** - Cross-sectional and Descriptive study
- ***Study area*** – Park Hospital, Gurgaon
- ***Study population*** -Doctors, Nurses, Housekeeping, Others
- ***Sample size*** – 80
- ***Sampling method*** – Convenience Sampling
- ***Data collection technique***- Interview
- ***Statistical software used for data analysis***- M S excel 2007

Study Findings:

- 50 out of 80 interviewees were aware of the definition while only 37 were aware of BMW MANAGEMENT RULES.
- More than half of the staff(50 out of 80) was unaware of the fact that there was a BMW management plan in the hospital or not
- Most of the staff mentioned that no labeling of infectious waste was done.

- Talking of color coding, when asked about color coding of anatomical waste, about 46 respondents out of 80 got it right.
- Staff mentioned it that no formal training has been given to them regarding BMW management
- Doctors and nurses had a fair amount of knowledge but when it comes to housekeeping, proper and aggressive training is required.

Recommendations:

- Proper training program for staff with special emphasis to housekeeping staff
- Awareness hoardings and stickers
- Proper supervision of BMW management
- Timely collection and disposal of waste

Conclusion:

Proper handling, treatment and disposal of biomedical waste play a vital role in hospital infection control programme.

The survey clearly shows that there is lack of proper training and awareness among the staff.

Besides training, the staff needs to follow a proper protocol for collection, segregation and disposal of waste.

ACKNOWLEDGEMENT

From the bottom of my heart, I would like to express my sincere thanks to **Dr. Ankit Gupta** (Medical Director) for giving me opportunity to work with the dedicated staff of Park hospital, Gurgaon.

Special thanks to Dr. Rajesh Bhalla (Dean Academics and Student affairs, IIHMR) who took all the necessary measures to make sure that we are under competent guidance.

I am grateful to my mentor, Dr. A.K.Khokhar (IIHMR) for his constant support and guidance.

I would also like to thank my family and friends. They were always supporting me and encouraging me with their best wishes.

Dr. Gaganbir Kaur (PT)

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ACRONYMS/ABBREVIATIONS

BMW- BIO-MEDICAL WASTE

WM- WASTE MANAGEMENT

OT- OPERATION THEATER

ICU- INTENSIVE CARE UNIT

OPD- OUT PATIENT DEPARTMENT

PART - 1

INTERNSHIP REPORT

Organization Profile

Park Hospital was founded by Dr. Ajit Gupta who believes in taking up challenging assignment where he can continue to apply his Social, Administrative & Hospital management skills in a wide exposure of medical services keeping a positive and committed & targeted attitude.

Park Hospital is a Multi super speciality tertiary care hospital which has attained supremacy in the field of health care services. Park hospital is religiously dedicated to provide latest, ultramodern and sophisticated medical care. The Hospital follows its principle of improving Health Care Processes via adopting exclusive equipments and technology in order to enhance the success rate & patient gratification. Park also has a team of highly proficient and veteran doctors & efficacious paramedical staff that link together to provide the most sophisticated & highest standard of care in all penchant of Health in conjunction with super specialties.

Park Hospital Units:

Park Hospital, West Delhi

Park Hospital, South Delhi

Park Hospital, Gurgaon

Park Hospital, Faridabad

Park Hospital, Panipat

Park Hospital has state of Heart and Lung institute. The institute is equipped with Siemens Flat Panel fixed Lab, Intra aortic Balloon Pumps and other important equipment including Modular OTS for open heart and Bypass surgeries with Ultra modern ICU/CCU complex. Park Hospital

also dreams of setting up of health care services by offering the crème of medical assistance with the help of excellent medical facilities. Park Hospital is ardently devoted to provide quality care that would treat health problems and simultaneously focus on overall well being of patient.

MISSION

"To deliver state-of-the-art personalized healthcare services to people of all social and economic background and achieve highest level of patient satisfaction."

VISION

"To be a leading name in the healthcare sector by providing holistic healthcare at affordable cost."

QUALITY PARAMETERS

•The hospital has been designed for maximum safety and comfort of the patients and healthcare providers. It complies with national &International standards for hospital accreditation.

•Clinical governance is an integral part of our practice.

•Robust quality and infection control practices are in place.

•Best in class modular OT's and ICU's with HEPA filters, laminar air flow & complete air changes per hour & access control minimize the risk of infection.

•Isolation rooms have been earmarked in the ICU to treat critically ill infectious patients thus preventing threat to other patients

•Green building: The hospital is designed to allow sunlight in most of the ICUs and patient rooms as it minimizes stress on the patients and gives them proper orientation of time.

•Stringent "Biomedical Waste Management" practices for segregation, storage, transport & disposal of hospital waste are in place.

•The hospital has one of the most advanced infrastructures which help in patient & employee safety & reduce the excessive burden on the environment.

•The "Hospital Information System" used is most advanced and user-friendly and helps to reduce medical errors as well as contributes to faster and better patient management.

Departments, Services, Facilities:

Park Hospital, West Delhi

Location: Keshopur Mandi, West Delhi

Promoters: Park Group of Hospitals

Total number of beds: 305 beds

Single specialty or multi-specialty: Multi-specialty hospital.

Park Hospital, Gurgoan

Location: Q Block, South City 2, Sec 47

Promoters: Park Group of Hospitals

Total number of beds: 250 beds (Proposed to Make 400)

Single specialty or multi-specialty: Multi Super specialty hospital.

AREA OF DISSERTATION: Operations

During the period(Feb- May, 2013) , I worked at PARK HOSPITAL, GURGAON in OPERATIONS during which I looked after day to day working of the hospital which gave me a better insight about operational aspect of the hospital.

OBJECTIVES OF INTERSHIP:

- To complete my internship with efficacy and efficiency
- To understand working of whole hospital and seek opportunity that provides me the real experience
- To groom myself as a professional

The duties required me to involve in the managerial activities of the hospital and perform daily rounds of the various departments.

DESIGNATION: Asst. Operations Manager

TASKS PERFORMED:

During the internship period, I was given the responsibility to coordinate and communicate various tasks like:

- Coordinate workforce management objectives with focus on individual, departmental and hospital wide initiatives and team concepts.
- Focus on patient satisfaction
- Facilitating admission and discharge process
- Supervision of housekeeping staff and looking after inventory management
- Coordinating with Front desk, MRD, Billing, Pharmacy, laundry and other departments

PART- 2

PROJECT REPORT

AWARENESS LEVEL ABOUT BIO-MEDICAL WASTE MANAGEMENT AMONGST THE STAFF AT PARK HOSPITAL

Chapter1

Introduction

Human beings are exposed to a huge variety of health risks over their entire life. Every day, relatively large amount of potentially infectious and hazardous waste are generated in the health care hospitals and facilities around the world.[1] Hospital is a place of almighty, a place to serve the patient. Since beginning, the hospitals are known for the treatment of sick persons but we are unaware about the adverse effects of the garbage and filth generated by them on human body and environment. 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. Hospital waste is a potential health hazard to the health care workers, public and flora and fauna of the area.[2] A special concern of environmental and humankind protection focuses on effective management of biomedical waste, incorporating an appropriate waste reduction and neutralization component. Along with this idea, a systemic approach of biomedical waste is compulsory, since without proper guidance, the hazardous medical waste management may compromise the quality of patient caretaking.

Medical care is vital for our life and health, but the waste generated from medical activities represents a real problem of living nature and human world. Main purposes of waste management are to clean up the surrounding environment and to identify the appropriate methods for waste neutralization, recycling and disposal. Within waste management, the health care waste management is a process that helps to ensure proper hospital hygiene and safety of health care workers and communities. Health care waste management concerns about planning and procurement, staff training and behavior, proper use of tools, machines and pharmaceuticals, proper methods applied for segregation, reduction in volume, treatment and disposal of biomedical waste. The literature studies have been demonstrated that there is not a single method of biomedical waste treatment or disposal that completely eliminates all risks to humans or to environment. The first step of this approach focuses on the risks caused by an inappropriate biomedical waste management.[3]

A modern hospital is a complex, multidisciplinary system which consumes thousands of items for delivery of medical care and is a part of physical environment and frequented by people from every walk of life in the society without any distinction between age, sex, race and religion. This is over and above the normal inhabitants of hospital i.e. patients and staff. All of them produce waste which is increasing in its amount and type due to advances in scientific knowledge and is creating its impact. The hospital waste, in addition to the risk for patients and personnel who handle these wastes poses a threat to public health and environment. Keeping in view inappropriate biomedical waste management, the Ministry of Environment and Forests notified the Biomedical Waste (management and handling) Rules, 1998" in July 1998 which was amended in 2003 and 2011. In accordance with these Rules, it is the duty of every "occupier" i.e. a person who has the control over the institution and or its premises, to take all steps to ensure that waste generated is handled without any adverse effect to human health and environment.[4]

Bio-medical waste is any waste generated in the process of diagnosis, treatment or Immunization of human beings or animals, research activities, production or testing of biological. It is estimated that only 6% of the waste stream is infectious that needs to be disinfected. 2% of the hospital waste stream is pathological waste and shall be burnt in a crematorium or other incinerator. The rest of the wastes, more than 90%, can be handled in the same way we handle solid wastes - by reducing, re-using, and recycling. [5]

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.

Categories of waste

The biomedical wastes are categorized into ten according to its characteristics taking into account treatment and disposal. The different categories of waste as per the rule are given in Table 1.

Table 1: Categories of Biomedical Waste

Waste Category	**Type of waste**	**Treatment And Disposal Option**
Category Number 1	Human Anatomical Waste (Human tissues, organs, body parts)	Incineration/deep burial
Category Number 2	Animal Waste (Animal tissues, organs, body parts, carcasses, Bleeding parts, fluid, blood and experimental animals used in research, waste generated by veterinary hospitals and colleges, discharge from hospitals, animal houses)	Incineration/ deep burial
Category Number 3	Microbiology and Biotechnology Waste (Wastes from laboratory cultures, stocks or specimen of live micro organisms or attenuated vaccines, human and animal cell cultures used in research and infectious agents from research and industrial laboratories, wastes from production of biologicals, toxins and devices used for transfer of cultures)	Local autoclaving/ microwaving / Incineration

Category Number 4	Waste Sharps (Needles, syringes, scalpels, blades, glass,	Disinfecting (chemical treatment / autoclaving / microwaving and mutilation / shredding
Category Number 5	Discarded Medicine and Cytotoxic drugs (Wastes comprising of outdated, contaminated and discarded medicines)	Incineration / destruction and drugs disposal in secured landfills
Category Number 6	Soiled Waste (Items contaminated with body fluids including cotton, dressings, soiled plaster casts, lines, bedding and other materials contaminated with blood.)	Incineration / autoclaving / Microwaving
Category Number 7	Solid Waste (Waste generated from disposable items other than the waste sharps such as tubing, catheters, Intravenous sets, etc.)	Disinfecting by chemical treatment/ autoclaving / microwaving and mutilation / shredding
Category Number 8	Liquid Waste (Waste generated from the laboratory and washing, cleaning, housekeeping and disinfecting activities)	Disinfecting by chemical Treatment and discharge into drains
Category Number 9	Incineration Ash (Ash from incineration of any biomedical waste)	Disposal in municipal landfill
Category Number 10	Chemical Waste (Chemicals used in production of biological, chemicals used in disinfecting, as insecticides, etc.)	Chemical treatment and discharge into drains for liquids and secured landfill for solids.

SEGREGATION OF BIOMEDICAL WASTE

Table 2

Color Coding and Type of Container

Color Coding	Type of Container	Waste Category	Treatment options (Schedule I)
Yellow	Plastic bag	Cat.1,Cat.2, Cat.3 and Cat.6	Incineration/ deep burial
Red	Disinfected container/plastic bag	Cat.3, Cat.6, and Cat.7	Autoclaving/Micro waving/ Chemical treatment
Blue/ White Translucent	Plastic bag/ puncture proof container	Cat.4 and Cat.7	Autoclaving/Micro waving/ Chemical treatment and destruction/ shredding
Black	Plastic bag	Cat.5, Cat.9, and Cat.10 (solid)	Disposal in secured landfill

Approach for hospital waste management

Based on Bio-medical Waste (Management and Handling) Rules 2011, notified under the Environment Protection Act by the Ministry of Environment and Forest (Government of India).

1. Segregation of waste

Segregation is the essence of waste management and should be done at the source of generation of Bio-medical waste e.g. all patient care activity areas, diagnostic services areas, operation theaters, labor rooms, treatment rooms etc. The responsibility of segregation should be with the generator of biomedical waste i.e. doctors, nurses, technicians etc. (medical and paramedical personnel). The biomedical waste should be segregated as per categories mentioned in the rules. (Annexure IV)

2. Collection of bio-medical waste

Collection of bio-medical waste should be done as per Bio-medical waste (Management and Handling) Rules. At ordinary room temperature the collected waste should not be stored for more than 24 hours.

3. Transportation

Within hospital, waste routes must be designated to avoid the passage of waste through patient care areas. Separate time should be earmarked for transportation of bio-medical waste to reduce chances of its mixing with general waste. Desiccated wheeled containers, trolleys or carts should be used to transport the waste/plastic bags to the site of storage/ treatment.

4. Treatment of hospital waste

4.1 General waste

The 85% of the waste generated in the hospital belongs to this category. The, safe disposal of this waste is the responsibility of the local authority.

4.2 bio-medical waste: 15% of hospital waste

1. Deep burial

2. Autoclave and microwave treatment (Annexure II)

3. Shredding (Annexure II)

4. Secured landfill

5. Incineration (Annexure III)

5. Safety measures

5.1 All the generators of bio–medical waste should adopt universal precautions and appropriate safety measures while doing therapeutic and diagnostic activities and also while handling the bio-medical waste.

5.2 It should be ensured that:

1. Drivers, collectors and other handlers are aware of the nature and risk of the waste.

2. Written instructions, provided regarding the procedures to be adopted in the event of spillage/ accidents.

3. Protective gears provided and instructions regarding their use are given.

4. Workers are protected by vaccination against tetanus and hepatitis B

6. Training

1. Each and every hospital must have well planned awareness and training programme for all categories of personnel including administrators (medical, paramedical and administrative).

2. All the medical professionals must be made aware of Bio-medical Waste (Management and Handling) Rules 1998.

3. To institute awards for safe hospital waste management and universal precaution practices.

4. Training should be conducted to all categories of staff in appropriate language/medium and in an acceptable manner.

7. Management and administration

Heads of each hospital will have to take authorization for generation of waste from appropriate authorities as notified by the concerned State/U.T. Government, well in time and to get it renewed as per time schedule laid down in the rules. Each hospital should constitute a hospital

waste management committee, chaired by the head of the Institute and having wide representation from all major departments. This committee should be responsible for making Hospital specific action plan for hospital waste management and its supervision, monitoring and implementation. The annual reports, accident reports, as required under BMW rules should be submitted to the concerned authorities as per BMW rules format.

8. Measures for waste minimization

As far as possible, purchase of reusable items made of glass and metal should be encouraged. Select non PVC plastic items. Adopt procedures and policies for proper management of waste generated, the mainstay of which is segregation to reduce the quantity of waste to be treated. Establish effective and sound recycling policy for plastic recycling and get in touch with authorized manufactures.[6, 7]

1.1 Rationale of the study

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.

1.2 Literature Review

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.[8]

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 color 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.[9]

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.[10]

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

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

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

1.3 Objectives

Main objective

- To assess the awareness level amongst the hospital staff regarding biomedical waste management policies and bio-medical waste management practices in the hospital

Specific objectives

- To determine the awareness level on bio-medical waste management rules and practices in the hospital among the staff
- To recommend possible remedial measures

Chapter 2

Data and methods

2.1 Study area

Park Hospital, Gurgaon.

2.2 Study population

Hospital staff: Doctors, Nurses, Housekeeping, Others

2.3 Sample size

To check the awareness 80 healthcare personnel were interviewed using a questionnaire

2.4 Sampling method

Convenience sampling

2.5 Study design

Cross-sectional and Descriptive study

2.6 Data collection technique

Interview

2.7 Data collection tool

Structured Questionnaire

2.8 Type of data

Primary data

2.9 Study period

May -2013

2.10 Statistical software used for data analysis

M S excel 2007

Limitations

Despite the efforts made to make the study as precise and objective as possible, certain limitations were there.

- As the sampling technique used is convenience sampling which can make study results biased.
- Accuracy of the findings depends on the accuracy of the information.
- The study concentrated on issues related to BMW management only. The study could be further expanded by focusing on issues related to hygiene, environment, and sanitation.
- Some of the interviewees were not in favor of filling of the forms and may have filled it in a hurry.

Chapter 3

Data analysis and findings

Analysis and interpretations of the data collected, to assess the awareness of employees about biomedical waste management. Analysis and interpretations of the data were based on the objective of the study which was

•To know the awareness level of hospital staff about biomedical waste management.

Following are the graphs produced on the basis of data collected from the hospital staff, that included doctors, nurses, housekeeping and others.

Awareness of Staff about the definition of BMW

Figure: 1 Overall Awareness:

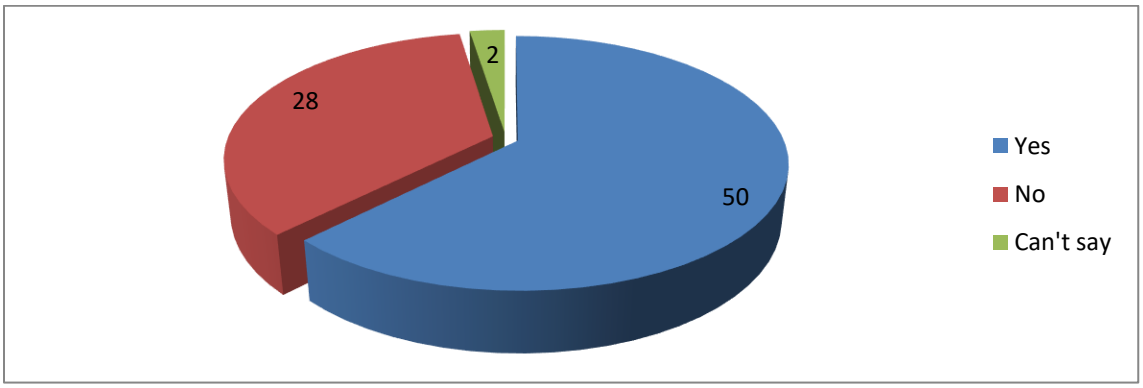
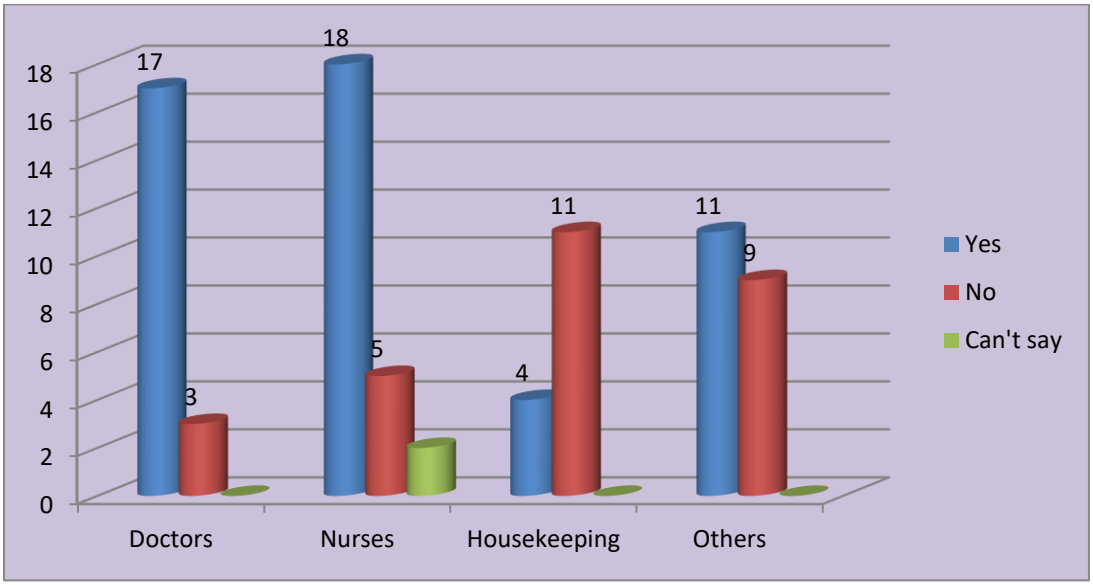


Figure: 2 Awareness after categorisation



Most of the staff excluding housekeeping staff was aware about the definition of biomedical waste.

Awareness about the generation of BMW in their respective departments

Figure: 3 Overall awareness

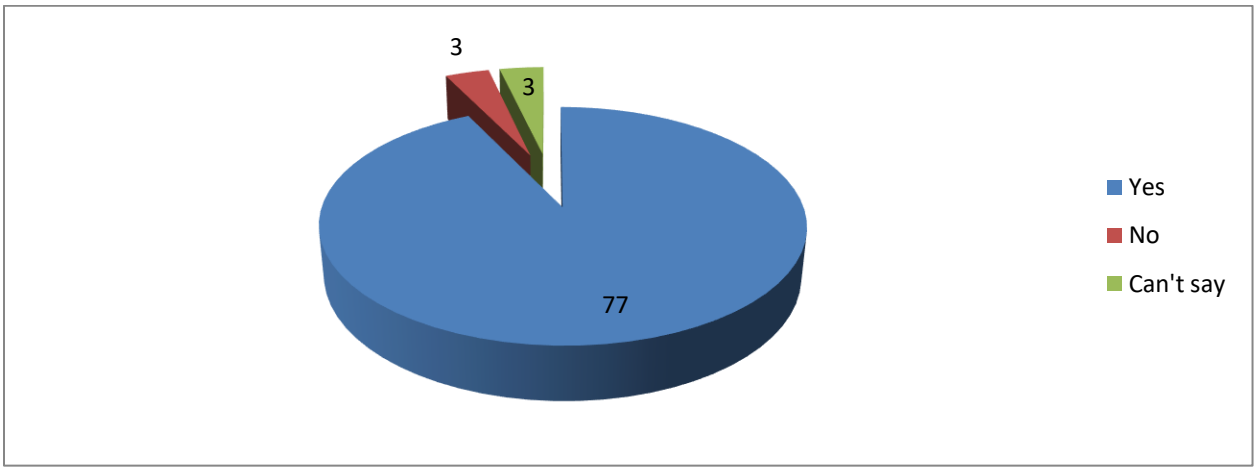
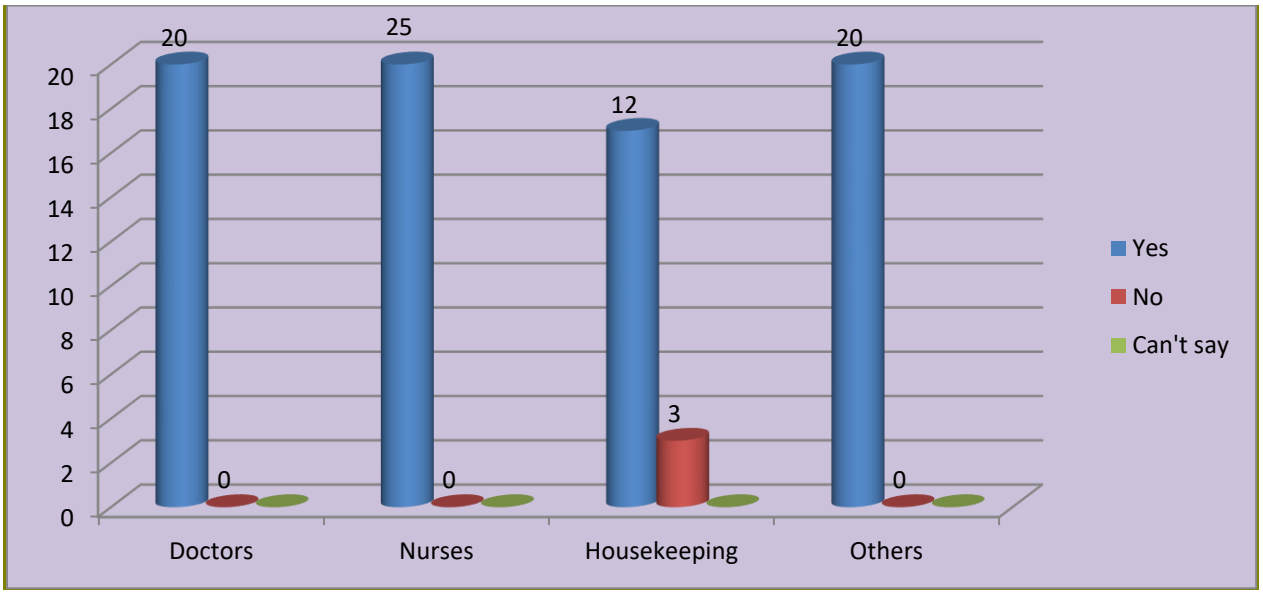


Figure: 4 Awareness after categorization



The figure shows that the staff was very much aware of the waste generated in the hospital

Awareness about the Legislation applicable to hospital waste Management

Figure: 5 Overall awareness

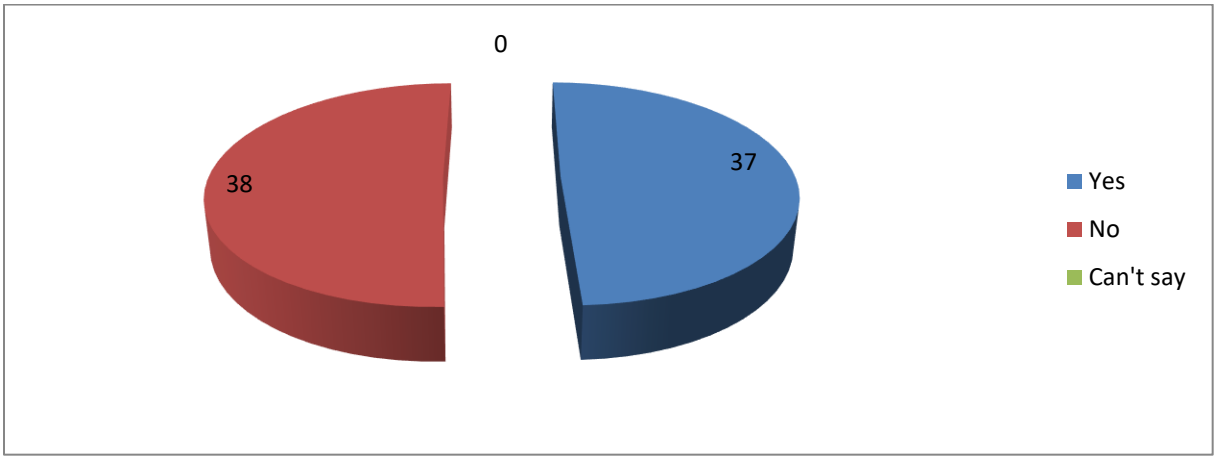
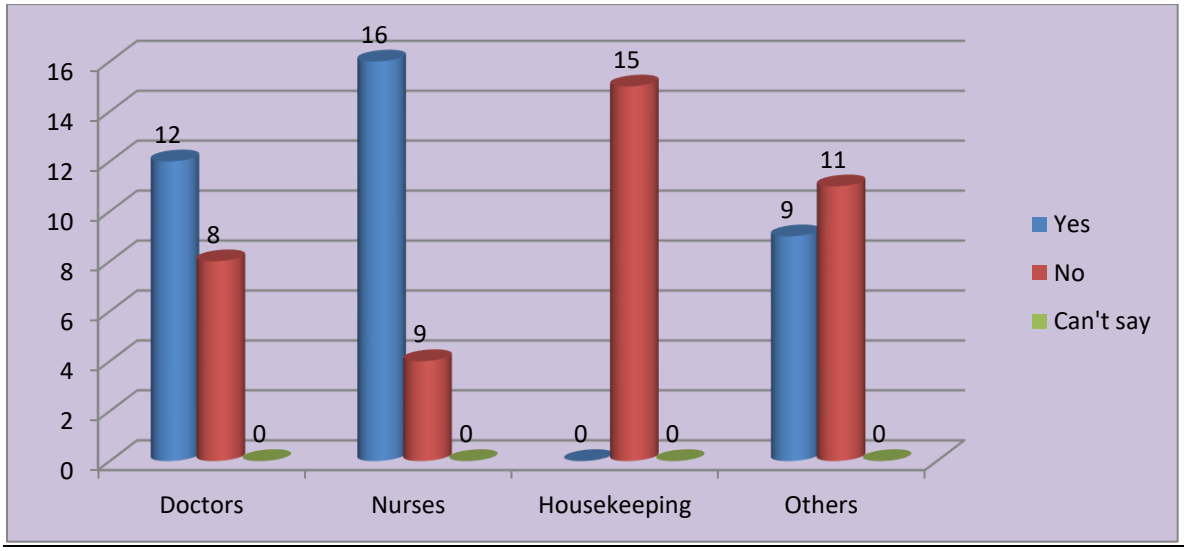


Figure: 6 Awareness after categorization



Doctors and nurses were quite aware of the rules whereas housekeeping was totally unaware on it, talking of the other staff, they were quite aware of the BMW rules.

Awareness about the Waste Management Plan of hospital

Figure: 7 Overall Awareness

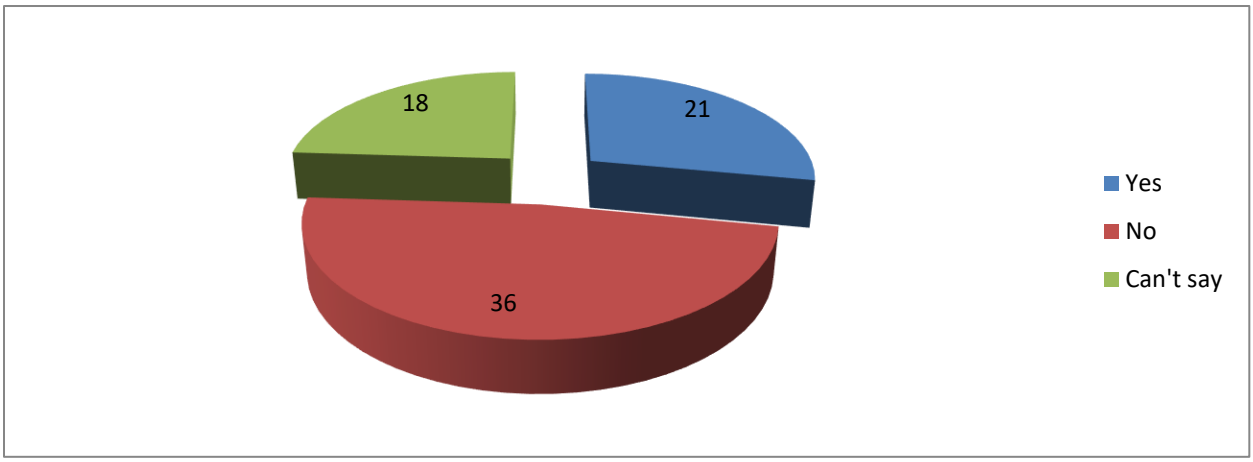


Figure: 8 Awareness after categorization

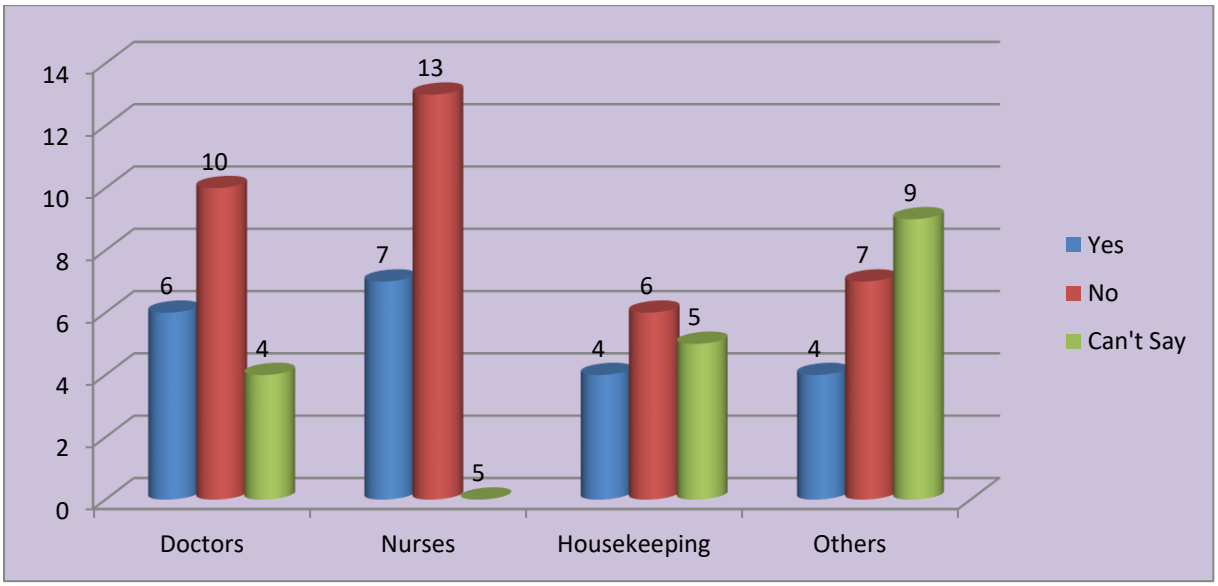


Figure shows that many of the staff was unaware of the hospital plan , many of the interviewees replied that they didn't knew whether a plan existed or not.

Awareness that Wastes should be segregated into different categories

Figure: 9 Overall awareness

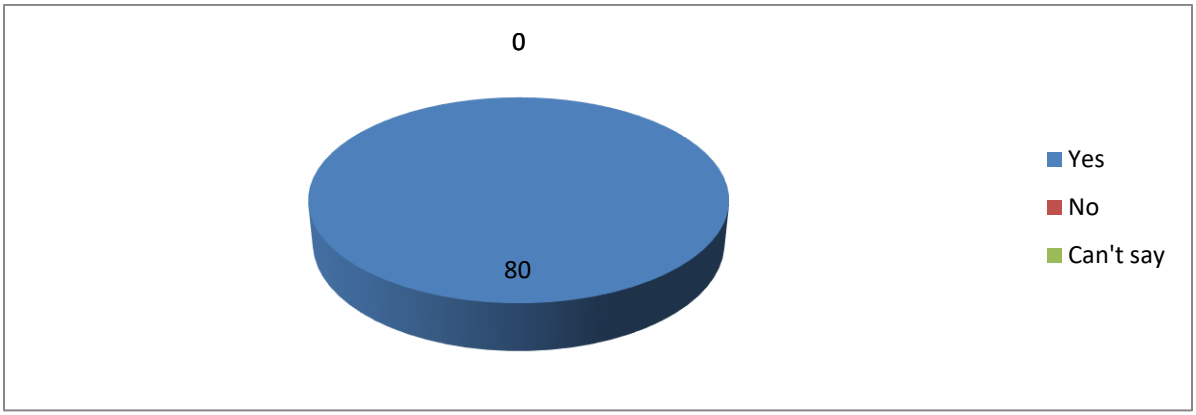


Figure: 10 Awareness after categorization

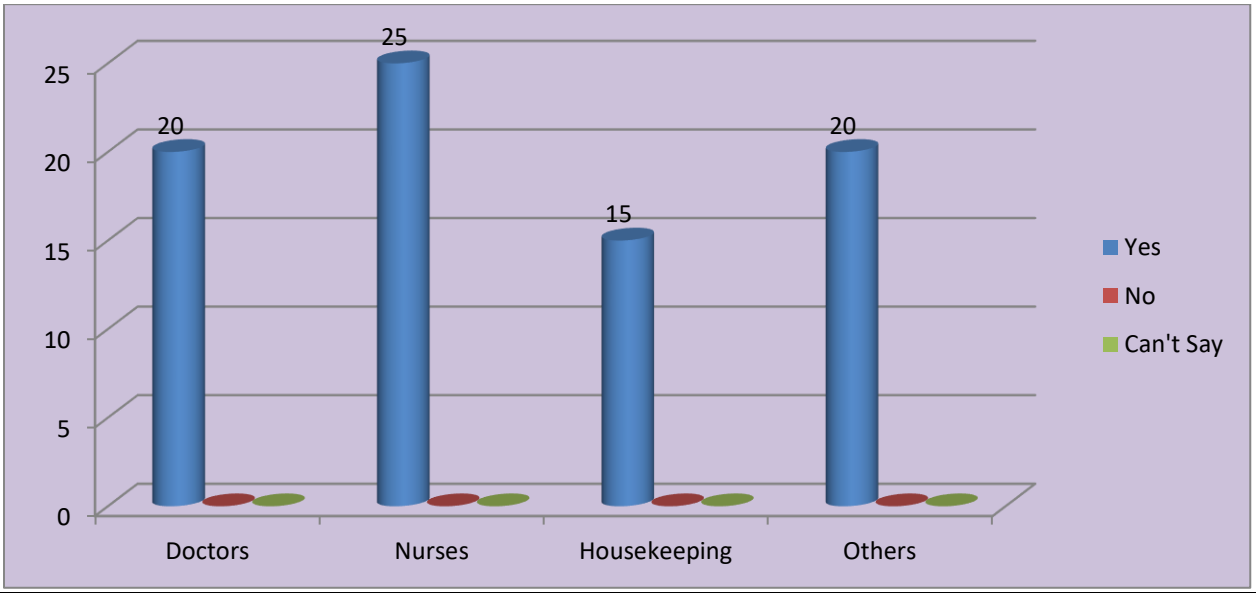


Figure shows that the staff is very much aware of the fact that the waste segregation should be done.

Awareness about the treatment of BMW

Figure: 11 Overall Awareness

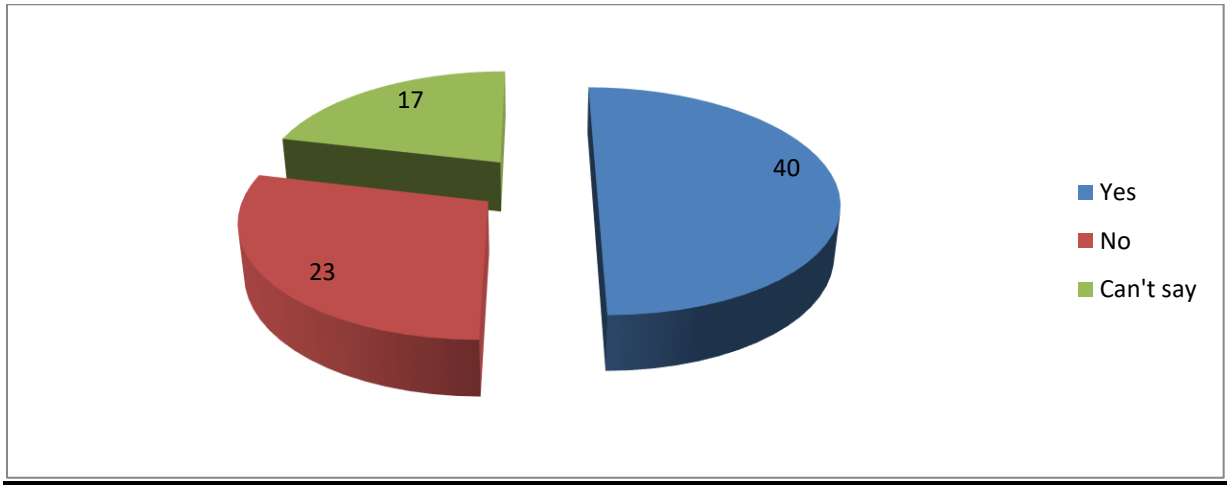
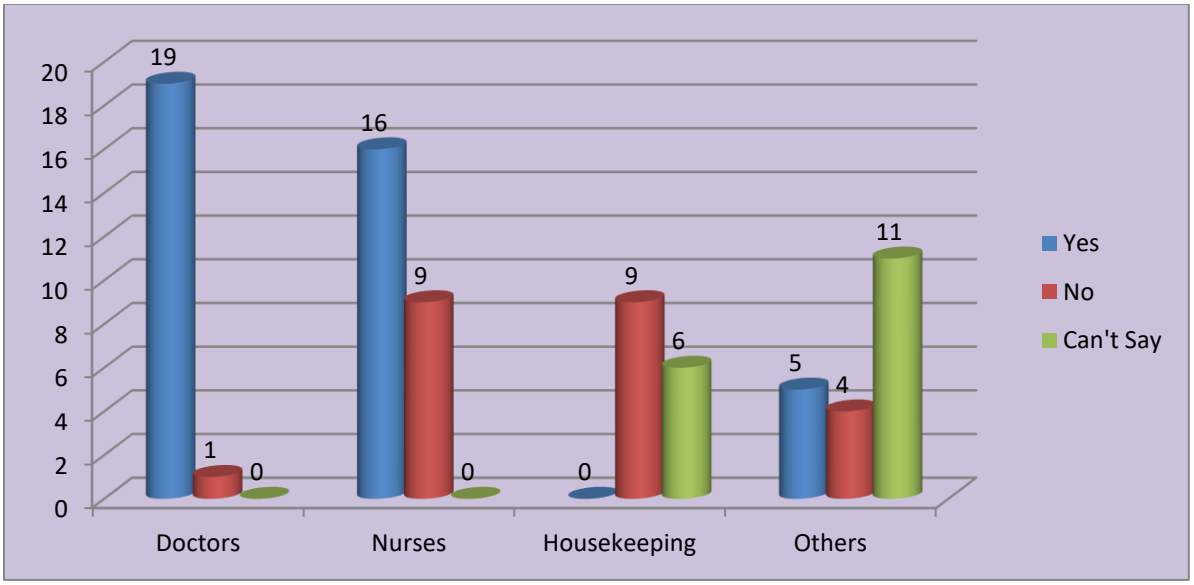


Figure: 12 Awareness after categorization



Doctors and nurses were quite aware while housekeeping department was totally unaware and mixed response was seen among other staff.

Is the infectious waste labelled with bio-hazard symbol

Figure: 13 Overall Awareness

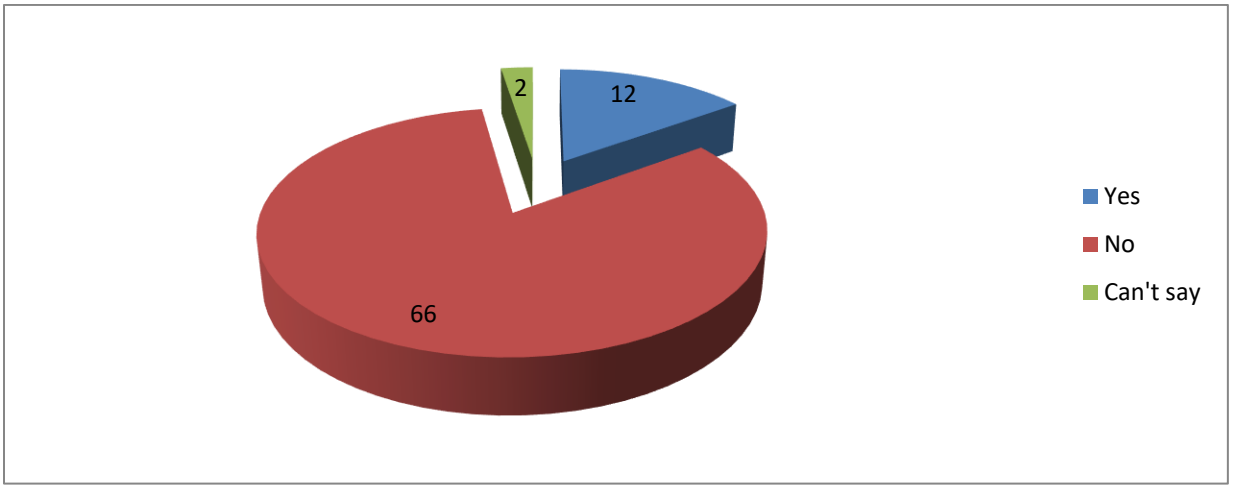
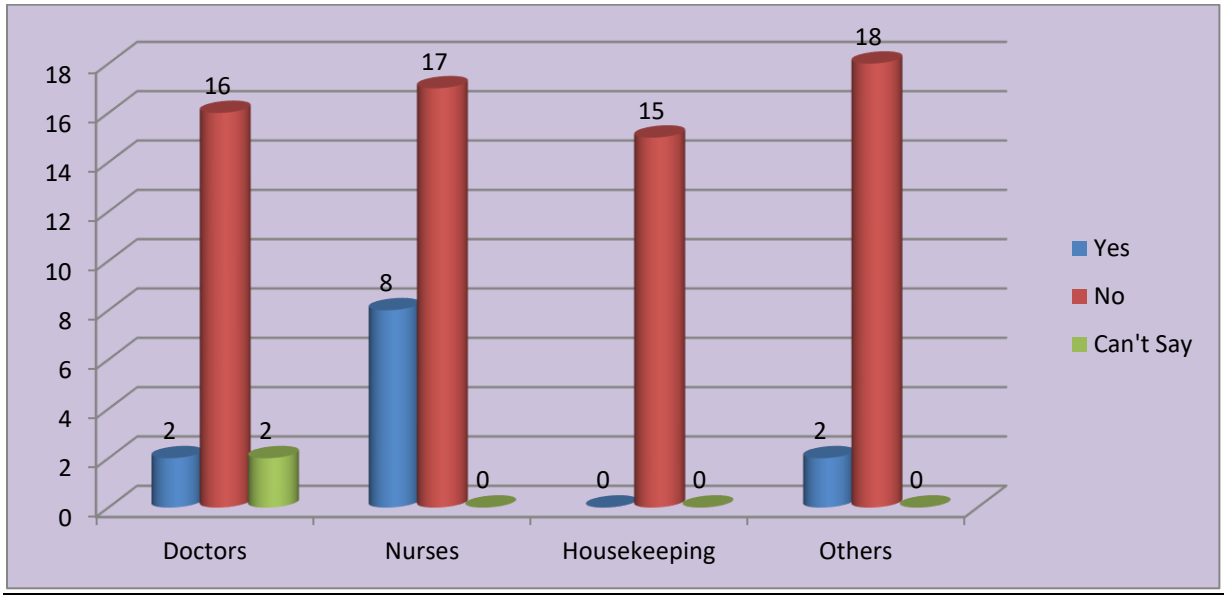


Figure: 14 Awareness after categorization



Most of the staff responded that the waste in the hospital is not properly labeled.

Awareness that improper BMW management leads to health hazards

Figure: 15 Overall awareness

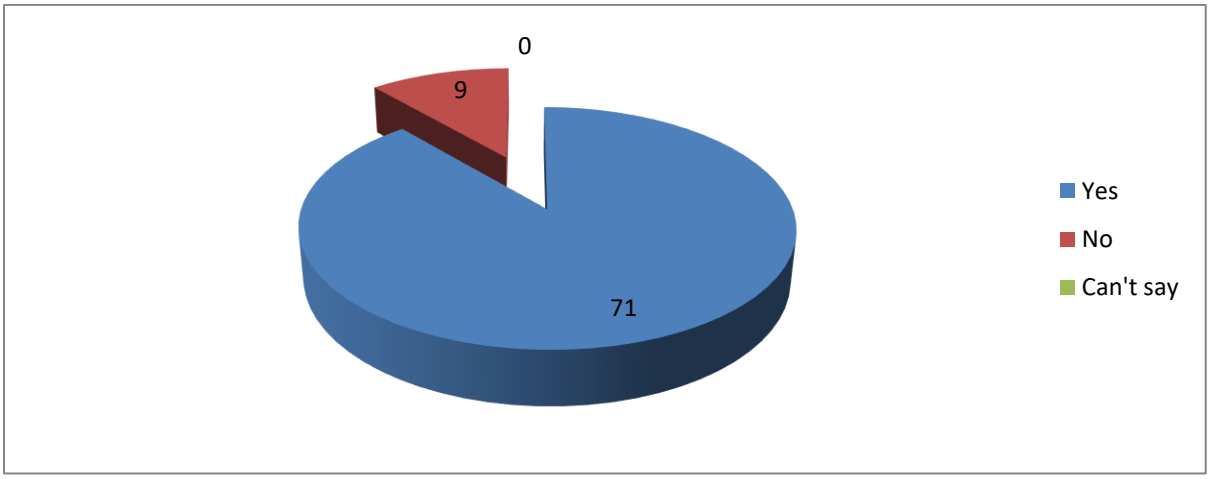
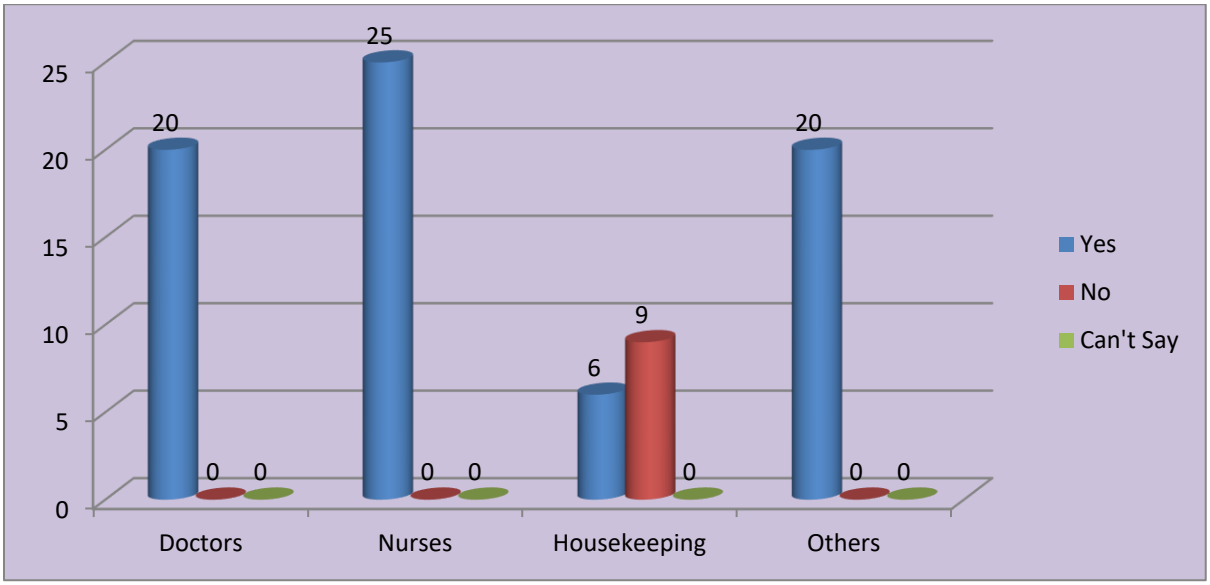


Figure: 16 Awareness after categorization



Almost whole of the staff was aware of the risks caused due to improper management of waste.

Awareness about the color coding for anatomical wastes

Figure: 17 Overall awareness

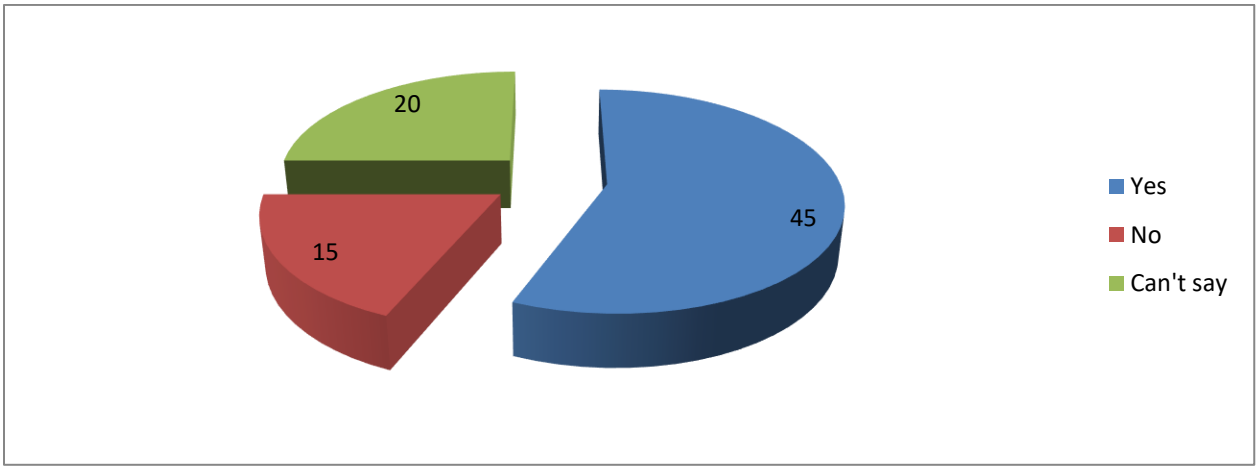


Figure: 18 Awareness after categorization

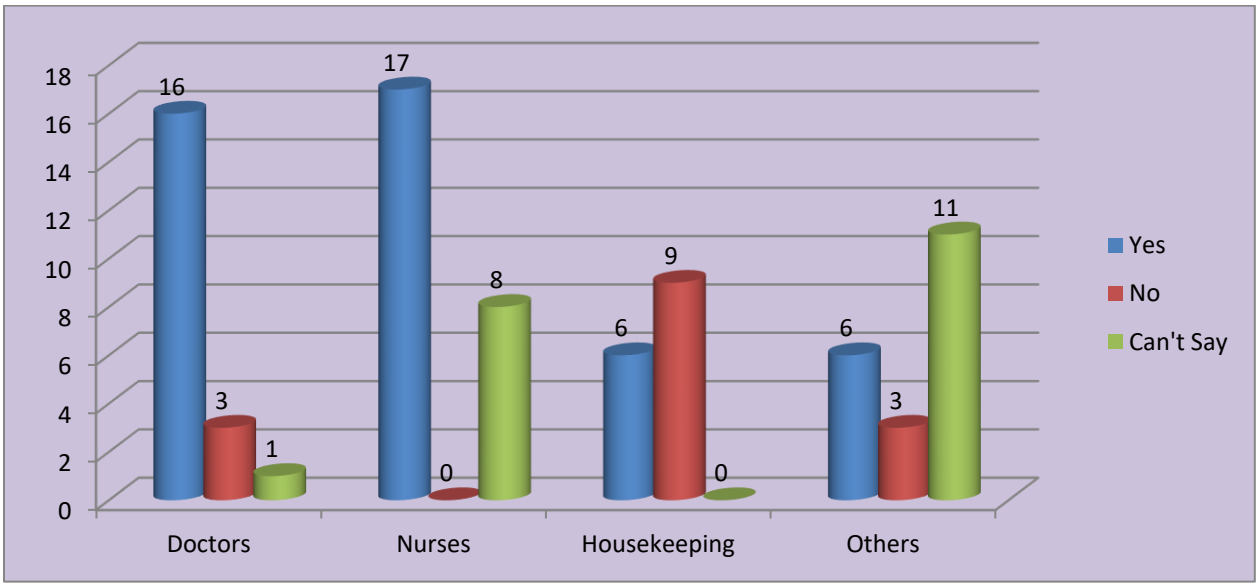


Figure shows that the doctors and most of the nurses were aware on this point and mixed response was seen among housekeeping and other staff.

Awareness about the color coding for general wastes

Figure: 19 Overall awareness

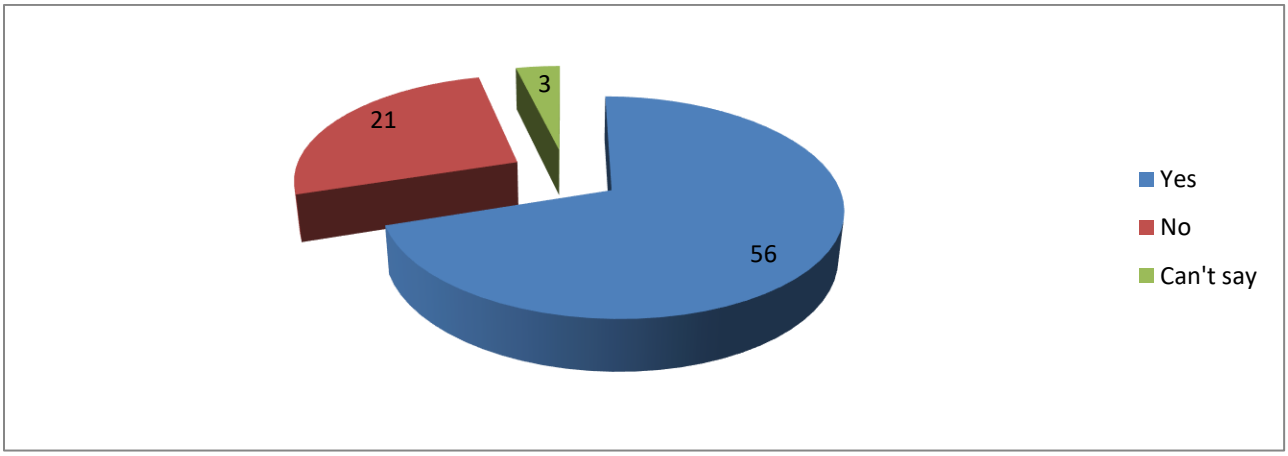
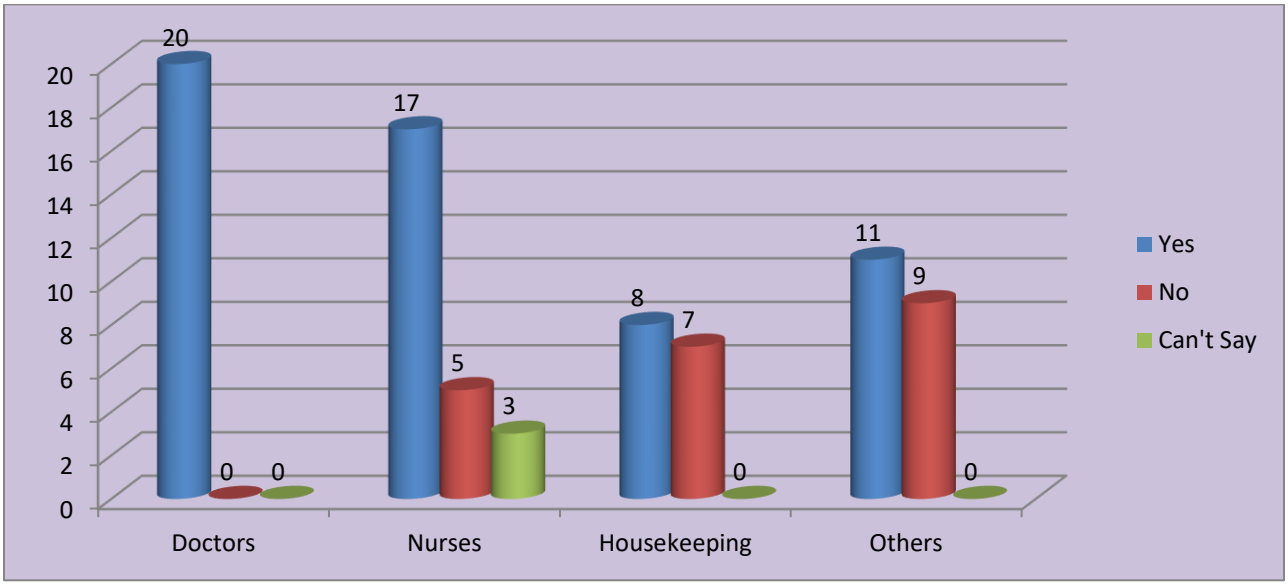


Figure: 20 Awareness after categorization



Mixed Response was seen regarding the above question.

Awareness about the Symbol of BMW

Figure: 21 Overall Awareness

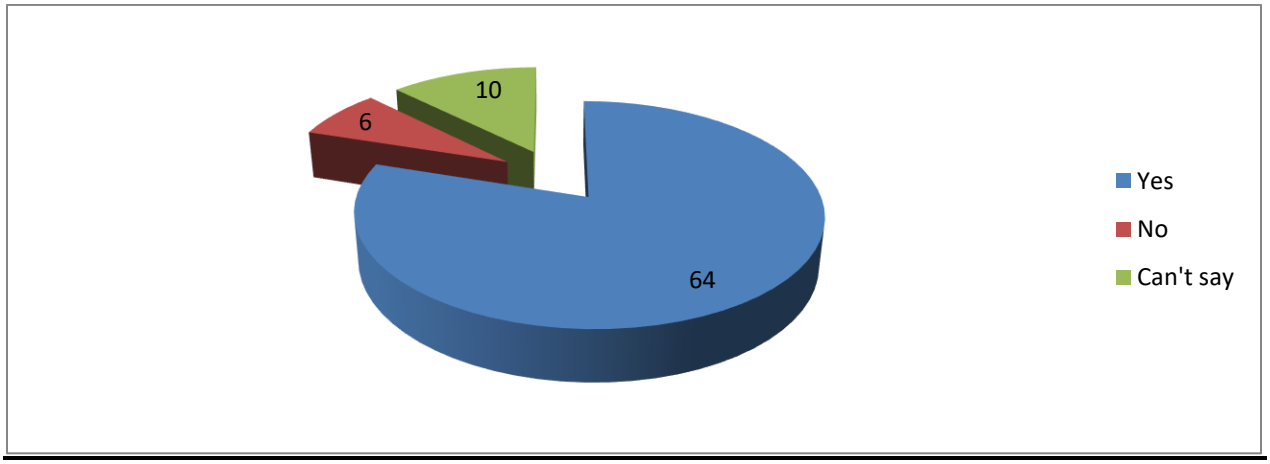
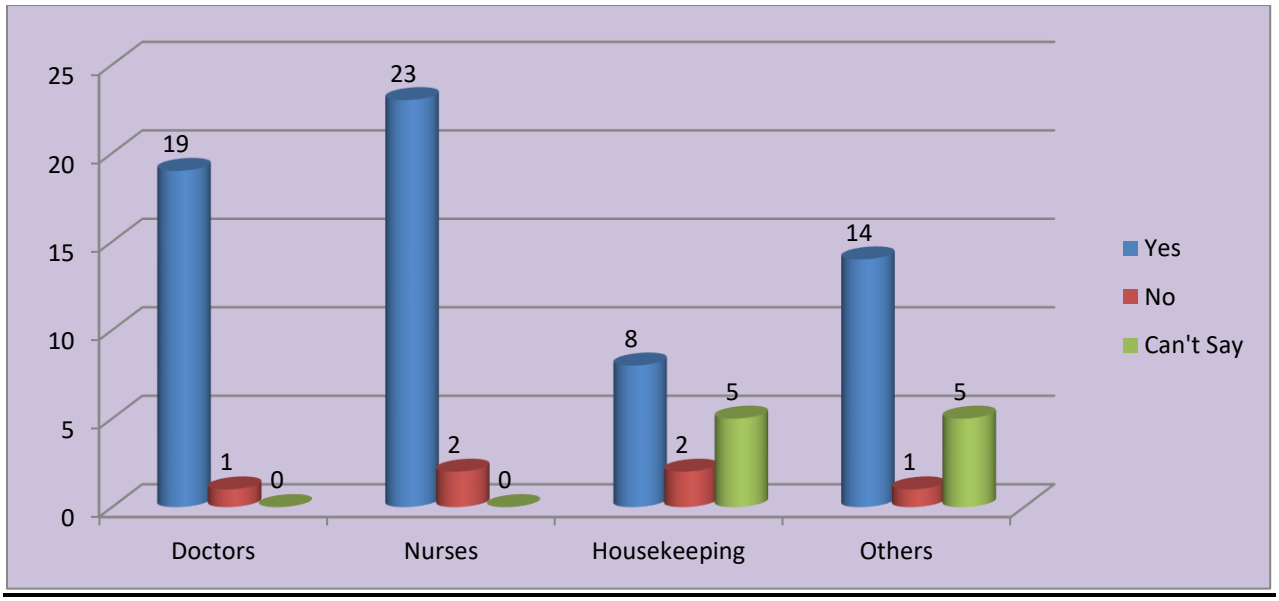


Figure: 22 Awareness after categorization



Most of the staff was aware except the housekeeping where a mixed response was seen.

Awareness about the training programme on hospital waste management in hospital

Figure: 23 Overall Awareness

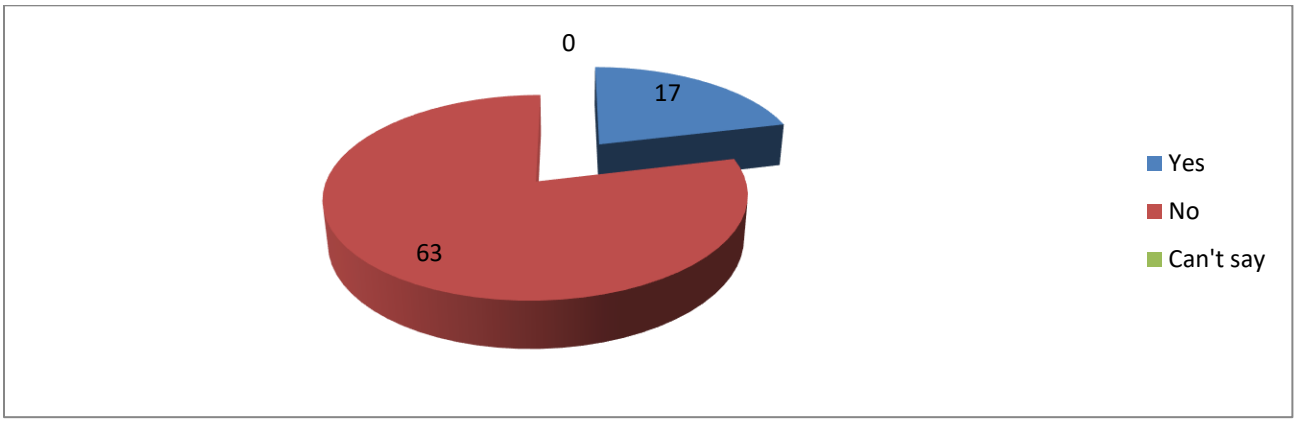


Figure: 24 Awareness after categorization

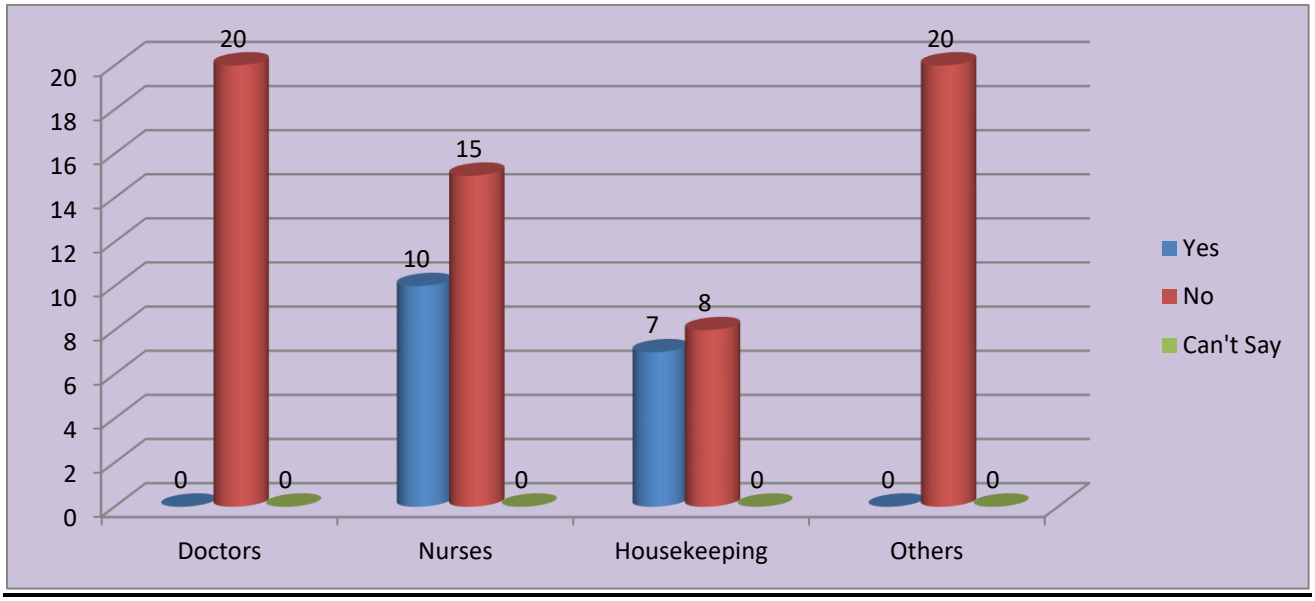


Figure shows that few of the nurses and housekeeping staff were aware of the program while doctors and other staff were completely unaware.

Awareness regarding treatment of sharps

Figure: 25 Overall awareness

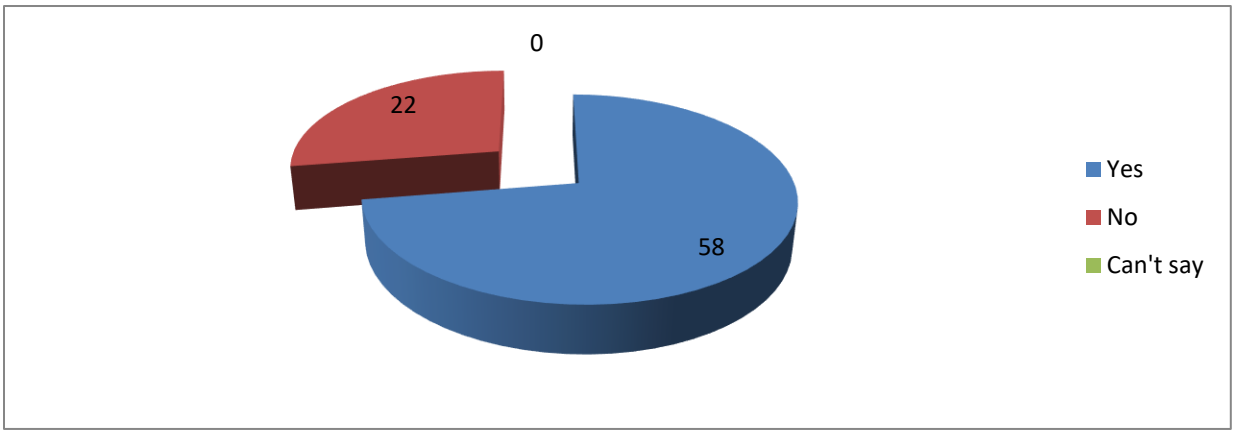
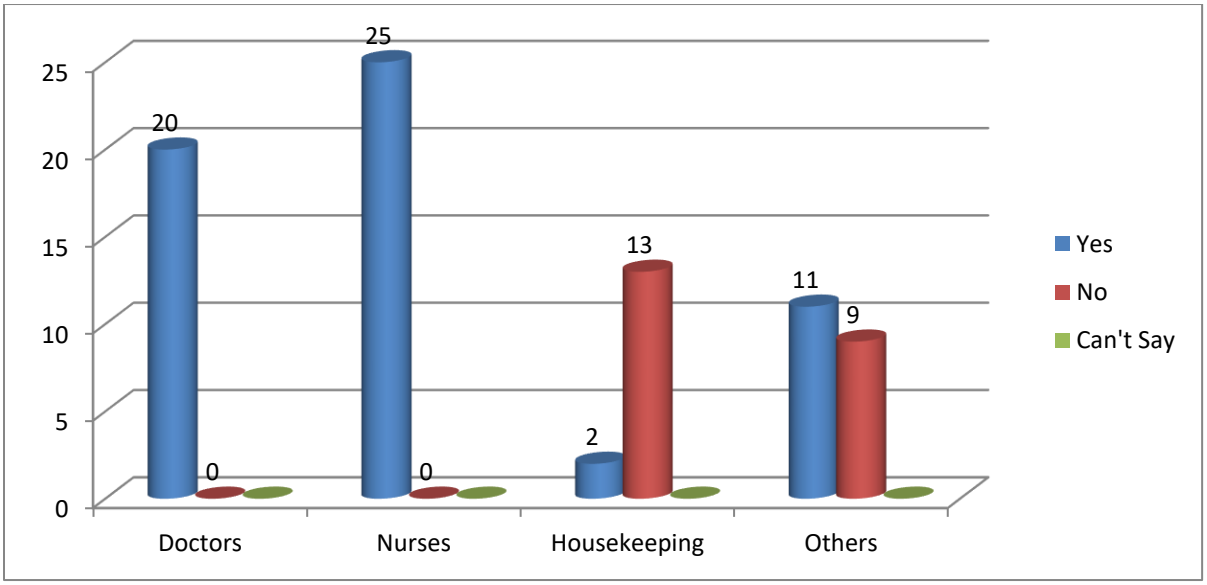


Figure: 26 Awareness after categorization



All the doctors were aware while less awareness was seen among housekeeping and other staff.

Chapter 4

Discussion

This was a cross sectional hospital based study conducted in Park Hospital, Gurgaon.Most of the departments of the hospital were studied. A total of 80 study subjects were selected conveniently, which included doctors, 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 doctors and nurses were aware about the definition of BMW, while the housekeeping staff was mostly unaware and mixed response was seen among the other staff.
- The staff was very much aware about the BMW produced in their respected departments.
- Most of the doctors and nurses were aware of the BMW management rules, while no housekeeping staff was aware of it, 9 out of the 20 others staff studied were very much aware of the rules.
- 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.
- Doctors and nurses had a good knowledge about the timing within which the BMW should be treated while mixed response was seen among the housekeeping and other staff.
- Talking of labeling 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.

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.

Chapter5

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, to prevent injury to the health care worker and workers in support services, while handling biomedical waste, to prevent general exposure to the harmful effects of the cytotoxic, and chemical biomedical waste generated in hospitals. If properly designed and applied, waste management can be a relatively effective and an efficient compliance-related practice.

Concluding from the results, the importance of training regarding biomedical waste management cannot be overemphasized; lack of proper and complete knowledge about biomedical waste management impacts practices of appropriate waste disposal.

Recommendations

- Proper and scheduled training has to be given for the staff.
- Awareness materials including hoardings, wall writing stickers etc should be provided in the hospital

It should be ensured that the injuries happening to the healthcare personnel are reported to the person in-charge of biomedical waste management and they should know about the remedial measure of accidental needle stick injury.

References

(1) Cole, E.C.: *Internal Medical Waste Management,* Durham, North Carolina, 1995.

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

(3) Environmental and health risks associated with biomedical waste management (Nikos E. Mastorakis, Carmen A. Bulucea, Tatiana A.Oprea, Cornelia A Bulucea, Philippe Dondon)

(4) Biomedical Waste Management : An Infrastructural Survey of Hospitals (Lt Col SKM Rao*, Wg Cdr RK Ranyal+, Lt Col SS Bhatia#, Lt Col VR Sharma**)

(5) Bio-medical waste disposal plant proposed by Chazhikkadan Medical Foundation at Thodupuzha *and* community health, environmental and human rights concerns - *A JANANEETHI REPORT*

(6) Bio Medical Waste Management In Hospitals, by:Samridha Neupane vth year nalsar university of law, Hyderabad

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

(8) http://www.rgci.org/php/showcotent.php?linkid=112andpatrid=1

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

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

(11) Biomedical waste management in nursing homes and smaller hospitals in Delhi

Appendices

QUESTIONNAIRE FOR INTERVIEWING HEALTHCARE PERSONNEL

QUESTIONNAIRE

1. Any waste which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities is called as biomedical waste.
   A) Yes B) No C) Can't say

2. Is there any biomedical waste generated in your department?
   A) Yes B) No C) Can't say

3. Is there any legislation applicable to the hospital waste management?

   A) Yes B) No C) Can't say

4. Does your hospital have a waste management plan?

   A) Yes B) No C) Can't say

5. Should waste be segregated into different categories?

   A) Yes B) No C) Can't say

6. Biomedical waste should be treated within 48 hrs.
   A) Yes B) No C) Can't say

7. Is the infection waste labeled with the Bio-Hazard Symbol?

   A) Yes B) No C) Can't say

8. Improper biomedical waste management leads to risk to the health of employees of the hospital, patients receiving treatment and visitors to the hospital.

   A) Yes B) No C) Can't say

9. Human anatomical and soiled wastes should go into yellow bag.
A) Yes B) No C) Can't say

10. General waste/Non infectious waste has to be put into black bag.
A) Yes B) No C) Can't say

11. Symbol used to label the biomedical waste container is

A) Yes B) No C) Can't say

12. Have you undergone any training programme on hospital waste management in your hospital?
A) Yes B) No C) Can't say

13. What is the procedure of treating the sharps?

……

THANK YOU FOR YOUR CO-OPERATION