Assessment of Knowledge, Attitude and Practices of Biomedical Waste Management at CK Birla Hospital, Jaipur

Dissertation Submitted to

The IIHMR University, Jaipur

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in

Hospital and Health Management

by

Dr Tanmay Charaniya

Under the Supervision and Guidance of

Dr. Neetu Purohit

2022

Declaration By Student

I hereby declare that this dissertation titled Assessment of knowledge, Attitude, and practices of biomedical waste management at CK Birla hospital, Jaipur is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

Name of Student: Dr. Tanmay Charaniya

Date: 06/07/2022

Certificate

CK BIRLA HOSPITALS | RBH

RBH/2022/July/HRD/4174

Date: 06th July, 2022

TO WHOM SO EVER IT MAY CONCERN

This is to certify that Dr. Tanmay Charaniya has successfully completed his internship training in Medical Administration Department from 10th Jan, 2022 to 31st May, 2022.

We found him sincere, punctual & hardworking. We wish him every success in his future and career.

For CK Birla Hospital - RBH

Akhilesh Kumar
Unit Head - HR

Abstract

"Bio-medical waste means any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or research activities pertaining thereto or in the production or testing of biological or in health camps." All waste that poses a risk to the environment or human health is deemed infectious and must be treated in accordance with the 2016 BMWM Rules. These wastes make up between 10 and 15 percent of the overall waste produced by the healthcare facility. Objective of this study was to evaluate the Knowledge, Attitude and Practices of the staff about the BMW system. A Descriptive cross-sectional study was conducted at CK Birla hospital, Jaipur. Hospital staff included in the study were doctors (30), nurses (60), GDA (10) and housekeeping (10). The research was performed over a three-month period, from March 2022 to June 2022. When the knowledge of all staff members was assessed, it was found that 97 percent of nurses, 93 percent of doctors, 48 percent of housekeeping, and only 35 percent of GDA personnel were knowledgeable of the procedures for managing biological waste. This study demonstrates unequivocally that technical staff lacked sufficient expertise in managing biomedical waste. Doctors and nursing personnel had much more understanding of color-coded bins than housekeeping and GDA workers did. According to the findings, the importance of training in biological waste management cannot be overstated because a lack of knowledge on this subject impairs procedures for efficient waste disposal.

Keywords: Biomedical Waste Management, BMW, Hospital acquired infections, HAI, Segregation, Waste collection, Waste Treatment, Disposal, Hazardous Waste.

Acknowledgements

The completion of this undertaking could not have been possible without the participation and assistance of so many people whose names may not all be enumerated. Their contribution is sincerely appreciated and gratefully acknowledged. However, I would like to express my deep appreciation and indebtedness to following individuals:

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Last but not the least I would like to express my appreciation to Dr. Aishwariya for her unconditional support throughout this memorable journey.

Table of Contents

List of Figures

List of Tables

Abbreviations

BMWM: Biomedical Waste Management.

HCF: Health Care Facility

IPD: In-Patient Department

CPCB: Central Pollution Control Board

CBWTF: Common Bio Medical Waste Treatment Facility

PHC: Primary Health Center

WHO: World Health Organization

HBV: Hepatitis B Virus

HCV: Hepatitis C Virus

HIV: Human Immunodeficiency Virus

Introduction

In the persuasion of the aim of reducing health problems, decreasing risks, and treating ill people, healthcare facilities inevitably create waste which itself may be hazardous to health. The waste produced in the course of healthcare activities carries a higher potential for infection and injury than any other types of waste. Inadequate and inappropriate knowledge of handling of healthcare waste may have serious health consequences and a significant impact on the environment as well. An efficient method of waste disposal is required due to the growing volume of waste. To prevent the spread of any epidemic that is harmful to human life, proper disposal is required. To prevent contaminating its surroundings, the disposal system should be sufficiently segregated. The prompt removal of bio-medical waste is essential to the entire disposal process since its buildup can contaminate the environment. To lessen the effect of disposal on the environment, the final product of the disposal chain should be reused. The hospital is one of the intricate institutions that is used by individuals from all facets of society, regardless of age, sex, ethnicity, or religion. This is in addition to the typical hospital occupants, such as patients and employees. They all generate garbage, which is expanding in quantity and variety as scientific knowledge grows and has an influence. The hospital waste poses a threat to the general public and the environment in addition to the risk to patients and staff who manages these wastes.

- **Definition**

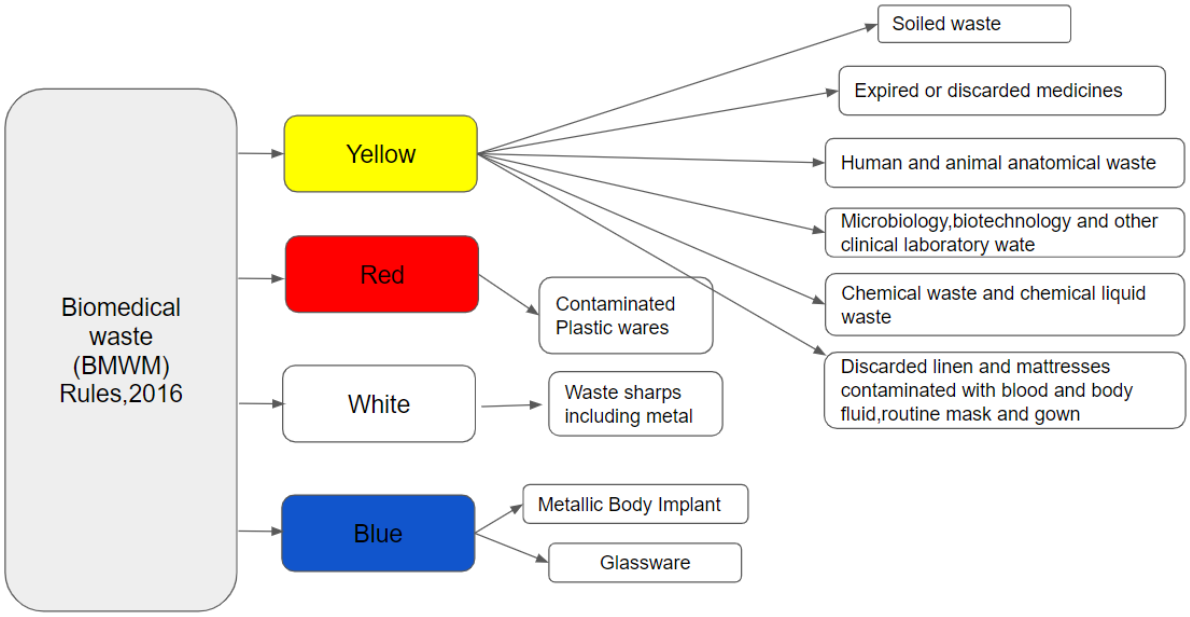
"Bio-medical waste means any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or research activities pertaining thereto or in the production or testing of biological or in health camps." (1)

All waste produced by healthcare facilities that, if improperly disposed of, might have a decremental effect on a person's wellbeing or the surrounding environment in general is classified as bio-medical waste. All waste that poses a risk to the environment or human health is deemed infectious and must be treated in accordance with the 2016 BMWM Rules. These wastes make up between 10 and 15 percent of the overall waste produced by the healthcare facility. Materials that have come into touch with the patient's blood, infected parts, secretions, biological liquids, medical equipment, medications, lab waste, sharps made of metal and glass, plastic, etc., are included in this trash. Based on the segregation and

color code, the Bio Medical Waste Management Rules, 2016, divide the bio-medical waste produced by the healthcare institution into 4 categories. Each of the categories is further allocated specific kinds of biomedical waste:

1. Yellow Category
2. Red Category
3. White Category
4. Blue Category

Figure 1.1. Categories of bio-medical waste



- **Process of Biomedical Waste Management:**

Waste segregation:

Separating waste at the point of generation is necessary and not at a later point in time. As previously stated, the term "Point of Generation" refers to the area under the authority of a doctor, nurse, or other medical professional who is treating a patient and, in the process, generating bio-medical waste. Guidelines for Healthcare Waste Management under the 2016 Biomedical Waste Management Rules, there should be posters or banners encouraging the separation of bio-medical waste in every ward and the waste storage facility. At the point where bio-medical waste is generated, there should be an enough number of colored bins, containers, and bags. The 2016 Plastic Waste Management Rules should be

followed while using colored plastic bags. Staff members who handle biomedical waste should be given personnel protective equipment.

Time of Collection for Bio Medical Waste Collection

Every day, at a set time, bio-medical waste needs to be collected from each hospital ward. Throughout the day, there can be many collections from wards. In accordance with the BMWM Rules, 2016, Healthcare facility should also make sure about the collection, transportation, treatment, and disposal of biomedical waste. HCF should also make sure that anatomical waste, dirty trash, and bio-technology waste are disposed of within 48 hrs. The amount of waste created in each part of the healthcare institution must determine collection times that are set and proportionate to that amount. Bio-medical waste should not be collected in the same cart or at the same time as general waste. For the majority of waste, collection should occur every day, timed to coincide with the pattern of waste creation throughout the day. For instance, infectious waste may be collected in the middle of the morning in an IPD ward where changing dressings is the first task of the day to avoid dirty bandages lingering in the area for too long. Since visitors to the facility produce a lot of general garbage, general waste collection must be done as soon as the HCFs are closed to visitors so as to prevent the cumulation of general waste inside the Healthcare facility. Collection schedules should allow the Healthcare facility to reduce/eliminate the need for temporary trash storage in the departments. The employees should be given PPEs to wear when handling biomedical waste.

Packaging

Sharps containers and biomedical waste bags should only be around three quarters full. They ought to be sealed and prepared for collection once they reach this point. Never staple plastic bags; instead, tie or seal them with a plastic tag or tie. Each garbage collection point should have extra bags or containers on hand so that empty ones may be changed out right away. Colour-coded waste bags & containers must be marked with biohazard sign, the date, the kind of waste, the amount of waste, the sender's and receiver's information, and a bar code to enable tracking till disposal.

Labeling

In line with the BMWM Rules, 2016, all bags, containers, and bins used for the collection and storage of bio-medical waste must be marked with the Biohazard or Cytotoxic Hazard symbol, depending on

the kind of waste. In compliance with CPCB recommendations for "Guidelines for barcode System for Effective Management of Biomedical Waste," biomedical waste bags and containers must be labelled with bar codes.

Provisional Storage

Temporary storage of biomedical waste should be prohibited in the wards and other locations of the Healthcare facility. In the areas used for operations and patient care, such as the operating room, no trash should be kept. Such places should be quickly cleared of any infectious materials. BMWs must be stored in a specific location away from patients and visitors or in a low-traffic area when there are no unclean utilities or sections present.

Transportation of Bio Medical Waste within Hospital premises

Transporting biomedical waste internally inside the perimeter of the hospital from the location of waste generation/temporary storage to the central waste collection center should be done in closed carts or containers. These containers should be fitted with wheels for ease of mobility. These containers are solely intended for the collection of biomedical waste. For BMW transportation, trolleys used for patients must not be permitted. The size of these containers should correspond to the amount of waste produced by Health care facility.

Route of intramural transportation of bio-medical waste

Health care institutions' bio-medical waste generated in various wards or laboratories must be moved in covered trolleys or carts along a path with little foot traffic from patients and other visitors. Preferably, the route of the transportation be selected so that:

- Transportation should not take place via high-risk regions
- Waste and supplies should be transferred via several pathways.
- Waste is not moved through locations with heavy patient and visitor activity.
- This route makes it simple to reach the Central Waste collection location.
- To prevent spills and dispersal of garbage, safe waste transportation is used.

Central Waste Collection Room for Bio-medical Waste

To store bio-medical waste until it is delivered to the CBWTF for treatment and disposal, each

healthcare establishment should make sure that there is a allotted central waste collecting room in their premises. Such a space must be the responsibility of a certain individual and must be secured with a lock and key. When building a central waste collecting chamber, the following factors may be taken into account:

- The central garbage collecting room's location must be off-limits to the general public and visitors.
- Space designated for this room should be sufficient for the amount of garbage produced by the hospital.
- Designated space should be big enough to hold the waste for minimum of 2 days.
- The assigned individual should be in charge of keeping the central garbage collecting room locked up, staffed, and covered.
- For convenient movement of garbage collection trolleys, the center's entrance must be reachable via a concrete ramp.
- Tiles or any other glazed material should be used for the flooring, and it should slope to make cleaning the area easier.
- The trash collecting area needs ventilation, which calls for exhaust fans.
- The healthcare facility must make sure that this central storage area is properly examined for any possible fire hazards and that, as a result of the inspection, preventative measures, such as the installation of fire extinguishers and smoke detectors, are adopted by the healthcare facility.
- The central location for waste storage should have a water supply nearby so that this station and the containers may be cleaned and washed. The Effluent Treatment Plant shall receive the drainage from the storage and washing area.
- Sign boards with pertinent information, such as the contact person and the phone number, have to be available.
- The phrase "Entry for Authorized Personal Only" & the sign for Bio-Medical Waste Hazard must be displayed at this station's entrance.
- Make sure that no general garbage is kept in the main area for waste collection.

Central Storage for HCFs Having Captive Treatment and Disposal System

The health care facilities must make sure that waste generated from the HCF is stored in this central waste collection area until it is transported to the reception area of the captive waste treatment facility

on the premises. This captive treatment facility treats and disposes of biomedical waste using incinerators, autoclaves/microwaves, shredders, etc. The interim storage area utilized for daily waste collection will act as the central waste collecting area for HCFs that have their own treatment and disposal facility through the usage of deep burial pits, such as Primary Health Centers (PHCs), which do not come under the coverage area of any CBWTF. Before being disposed of by deep burial pits in accordance with the guidelines outlined below, the collected trash must be stored in this location.

- **Classification of Bio-medical Waste according to the World Health Organisation:**

Eight major kinds of medical waste have been established by the WHO. These are:

- Infectious waste: Waste from patients with infections, such as swabs, bandages, and disposable medical devices; Waste contaminated with blood & other bodily fluids; Cultures and stocks of infectious agents from laboratory work; Waste from autopsies and infected organisms from laboratories.
- Pathological waste: bodily parts, infected animal carcasses, and human tissues, organs, or fluids.
- Sharps waste: needles, syringes, disposable scalpels and blades, etc.
- Chemical waste: for instance, chemicals used in laboratory preparations, disinfectants, sterilants, and heavy metals found in medical devices (such as mercury in thermometers that have cracked), batteries, and cleaning agents.
- Pharmaceutical waste: medicines and vaccinations that are out-of-date, unused, or tainted;
- Cytotoxic waste: waste containing genotoxic compounds, such as cytotoxic medications used in cancer therapy and their metabolites (i.e., very dangerous substances that are mutagenic, teratogenic, or carcinogenic);
- Radioactive waste: such as radionuclide-contaminated items, such as radioactive diagnostic or treatment supplies.
- Non-hazardous or general waste: waste that doesn't provide a particular risk to health from a biological, chemical, radioactive, or physical standpoint.

High-income nations produce up to 0.5 kg of hazardous waste per bed per day on average, compared to 0.2 kg in low-income nations. However, in low-income nations, it's common for medical waste

to not be divided into hazardous and non-hazardous wastes, thus the actual amount of hazardous waste is significantly larger.

- **Risk associated with biomedical waste:**

The primary groups exposed to hazards at a hospital or healthcare centre are:

Patients; visitors; medical professionals (including doctors, nurses, technicians), maintenance personnel; auxiliary service employees, including those in the laundry and medical supply industries as well as those responsible for collecting and transporting garbage; Workers in the health unit's service department who handle waste treatment and disposal. Hepatitis B virus (HBV), hepatitis C virus (HCV), and HIV virus are the three infections that are most often spread among health care workers. According to estimates, out of the 35 million health care workers globally, 3 million experience hard contact to bloodborne viruses each year, with 2 million of them experiencing HBV, 0.9 million experiencing HCV, and 170,000 experiencing HIV. Additionally, there is a risk to the personnel who are involved in the collection and handling of biomedical waste.

Additional adverse health effects linked to Biomedical waste and by-products include:

- injuries caused by sharps.
- exposure to toxic pharmaceutical products, particularly antibiotics and cytotoxic drugs released into the environment; to substances such as mercury or dioxins.
- chemical burns resulting from disinfection, sterilisation, or waste treatment activities.
- air pollution caused by the release of particulate matter during medical waste incineration;
- thermal injuries related to open burning and the operating of medical waste incinerators

Review of Literature

TITLE	AUTHOR	OBJECTIVE	FINDINGS
Assessment of knowledge, attitude and practice about biomedical waste management among healthcare staff of Fasa educational hospitals in COVID-19 pandemic	SakineShekoohiyan 1,FatemehParsaeeSaraGhayour Year : December 2022	To explore the knowledge, attitude, and practice about BMW among the healthcare staff of Fasa educational hospitals.	The present cross-sectional study used an online questionnaire survey to collect data from 251 employees in Valiasr and Shariati hospitals in 2021. T-test, ANOVA, and Pearson correlation coefficient were used to test the relationships between and among the variables. Demographic findings showed that the men and women participated to an almost equal rate. Most participants were young and had less than 5 years' work experience. Their mean scores of knowledge, attitude, and practice were 38.8±6.1, 83.0±8.8, and 47.5±14.5, respectively. These values point to a satisfactory level of each variable in relation to BMW management. Pearson's correlation coefficient test showed a strong positive association between knowledge and practice ($r = 0.725$). The T-test results showed a statistically significant relationship among knowledge, attitude, and practice across demographic variables. These included gender, ward (COVID vs. Non-COVID), and workplace ($p < 0.05$). ANOVA results showed statistically

			significant divergences in knowledge, attitude, and practice across the demographic variables, including education, position, and employment type ($p < 0.05$). Considering the current deficiencies among employees in terms of BMW acronyms, lack of waste training courses, and inappropriate waste plans for COVID-19 waste management, BMW training courses should be held continuously and regularly, and the content of the programs should be updated according to the emergencies.

Assessment of Biomedical Waste Management in Health Facilities of Uttar Pradesh: An Observational Study(2)	Anand M Dixit,1 Priyanka Bansal,2 Pankaj Jain,3 Prashant K Bajpai,3 Rama S Rath,1 and Pradip Kharya Year: December 2021	To assess biomedical waste management in various health care facilities of Etawah district.	A total of 56 health care facilities (HCFs) from both government and private sectors were selected. Biomedical waste guidelines are mainly available at tertiary care centers (93%) and secondary care centers (51.5%). Awareness among doctors related to hazards and prevention of hazards (<0.001), knowledge of unused sharps (0.048), contact with a blood-related product (0.003), hazardous waste (<0.001), and need for training (<0.001) are statistically significant with respect to nurses.
Biomedical Waste Management: A Study on Assessment of Knowledge, Attitude and Practices Among Health Care Professionals in a Tertiary Care Teaching Hospital(3)	Divya Rao1, M. R. Dhakshaini2, Ameet Kurthukoti3 and Vidya G. Doddawad4 Year: September 2018	To ascertain the levels of and the expanse of gaps in knowledge, attitudes and practices among doctors, post graduates, staff nurses, laboratory technicians and house-keeping staffs in a tertiary care teaching hospital in Mysuru, Karnataka.	To ascertain the levels of and the expanse of gaps in knowledge, attitudes and practices among doctors, post graduates, staff nurses, laboratory technicians and house-keeping staffs in a tertiary care teaching hospital in Mysuru, Karnataka.

Study on assessment o f biomedical waste management practices in a tertiary care hospital in a district of assam(5)	Alpana Priya Rabha1, Pankaj Bayan2, Arpita Nath3, Rupali Baruah4 Year: August 2018	The objective of the study is to assess the biomedical waste management practices and to evaluate the knowledge regarding biomedical waste management practices among healthcare workers.	The study has found that the highest numbers of blue/ white bins (96.2%) and yellow bins (90.7%) were correctly located. Red bags were available sufficiently and only 90 (7%) (yellow bags) were available. Collection, separation, storage and transportation of all the bags in the ho spitals were done 100% daily. The usage of perso nal protective equipment was also found to be satisfactory, but all the personal protective equipment was not available 100%. The training of the health care workers wa s also found to be inadequate in the hospital. The knowledge and practi ces of biomedical waste management among the h ealthcare workers were also found to be inadequate in the hospital. Hepatitis B vaccination status among the health care workers was also found to be inadequate.

Assessment of Knowledge, Practice and Attitude about Biomedical Waste Management among Healthcare Professionals during COVID-19 Crises in Al-Ahsa(6)	Sahbanathul Missiriya Jalal 1,* , Fahima Akhter 1, Amal Ismael Abdelhafez 1 and Ahmed Mansour Alrajeh Year: June 2021	The study was performed to assess the knowledge, practice, and attitude on BMW management among HCPs when taking care of patients with COVID-19 and associated with demographic variables	Al-Ahsa healthcare sectors, 256 HCPs were selected randomly, of which 105 (41%) had excellent knowledge, 87 (34%) had good knowledge, and 64 (25%) had poor knowledge with a mean score of 13.1 ± 3.6. A higher mean score was (14.4 ± 3.2) obtained by physicians, and (13.6 ± 3.8) nurses than the other HCPs. Regarding practice, 72 (28.1%) HCPs used and discarded PPE while handling biomedical wastes. Additionally, 88 (34.4%) followed proper hand hygiene before and after each procedure and whenever needed. Physicians, nurses, and respiratory therapists had a more favorable attitude than other HCPs. There was a statistically significant association found among knowledge level and educational qualification ($p < 0.0001$), gender ($p < 0.001$), and work experience ($p < 0.05$). Emphasis is needed to train all HCPs regarding proper BMW management during this pandemic to prevent infection transmission.

Research question: What is the level of Knowledge, Attitude and Practices about BMW among the hospital staff at CK Birla hospital, Jaipur?

Objective: To assess the Knowledge, Attitude and Practices of the staff about the BMW system.

Methodology

- **Research design:** Descriptive cross-sectional study was conducted
- **Study Area:** The study was conducted at CK Birla hospital, Jaipur
- **Study population:** Hospital staff included in the study were doctors(30), nurses(60), GDA(10) and housekeeping(10)
- **Study duration:** The research was performed over a three-month period, from March 2022 to June 2022.
- **Technique used for Sampling:** Convenience sampling
- **Sample Size:** The sample size of 110 employees was considered.
- **Data type**: Primary data was collected for the study.
- **Method of data collection**: The data was collected through a self-administered questionnaire
- **Data analysis:** The responses were collected and cleaned and screened using MS-Excel. Graphical representations were used for depiction of correlations.

Results

ASSESSMENT OF KNOWLEDGE

The questionnaire was evaluated, and percentage about the degree of knowledge was determined.

Figure 4.1 Knowledge about the time for which the biomedical waste can be stored in the health-care facility

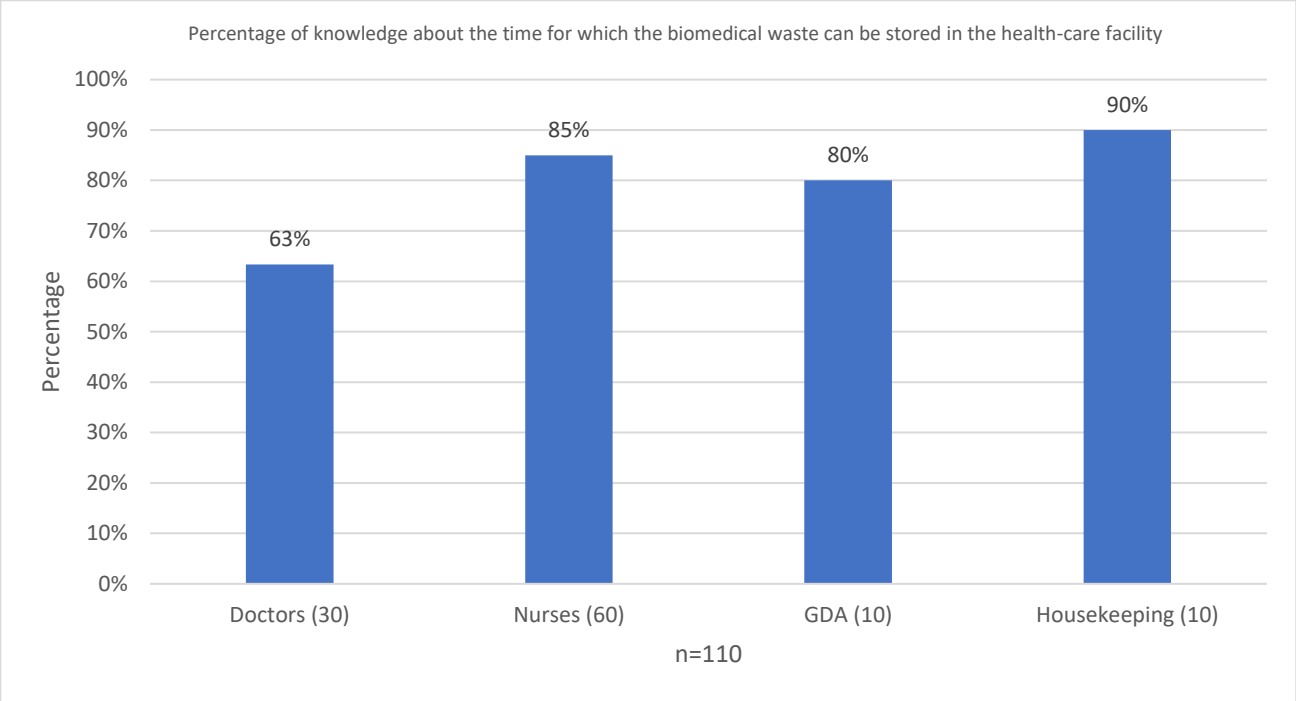


Figure 4.1 exhibits that highest level of knowledge was seen among 90% of housekeeping staff followed by 85% of nurses, 80% and 63% of GDA and Doctors respectively.

Figure 4.2 Knowledge about symbol used to indicate Biohazard

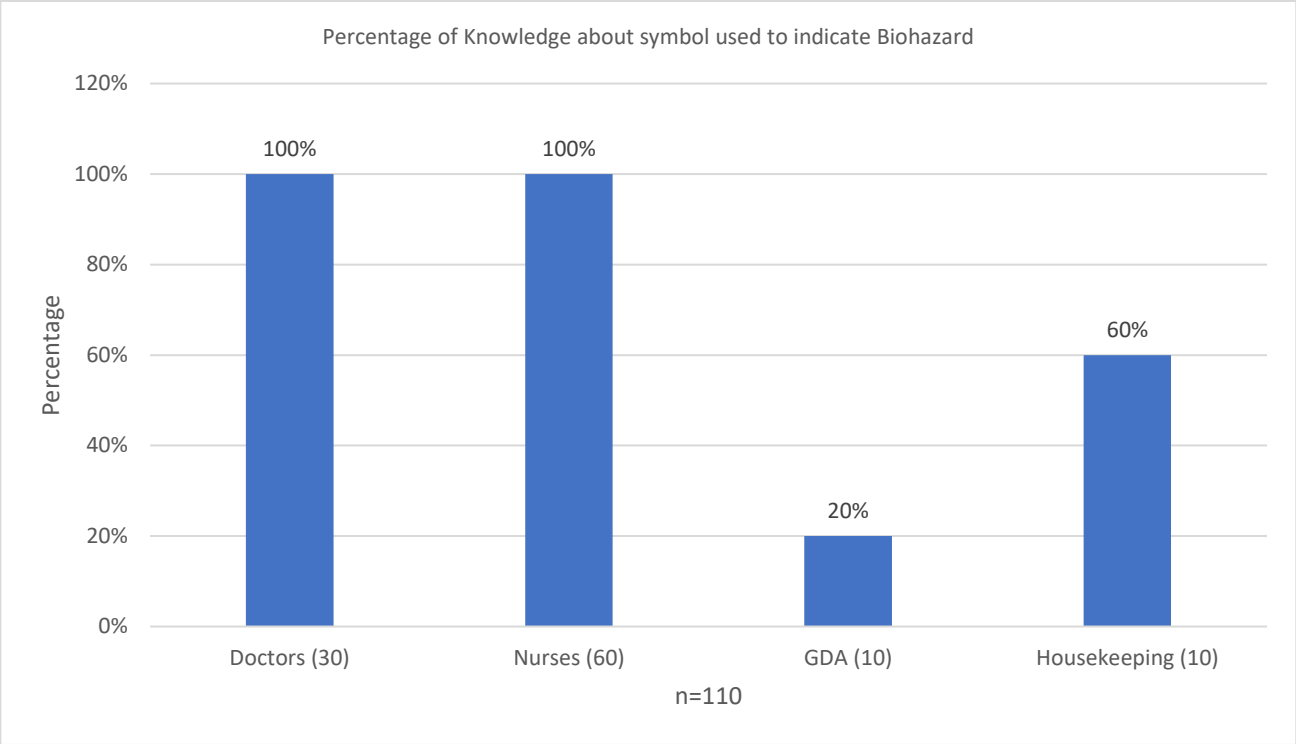


Figure 4.2 exhibits that knowledge about the symbol used to indicate Biohazard. indication is highest in doctors and nurses that is 100% and lowest in housekeeping and GDA staff that is 60% and 20% respectively.

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Figure 4.3Knowledge about disease that can be caused due to Biomedical Waste

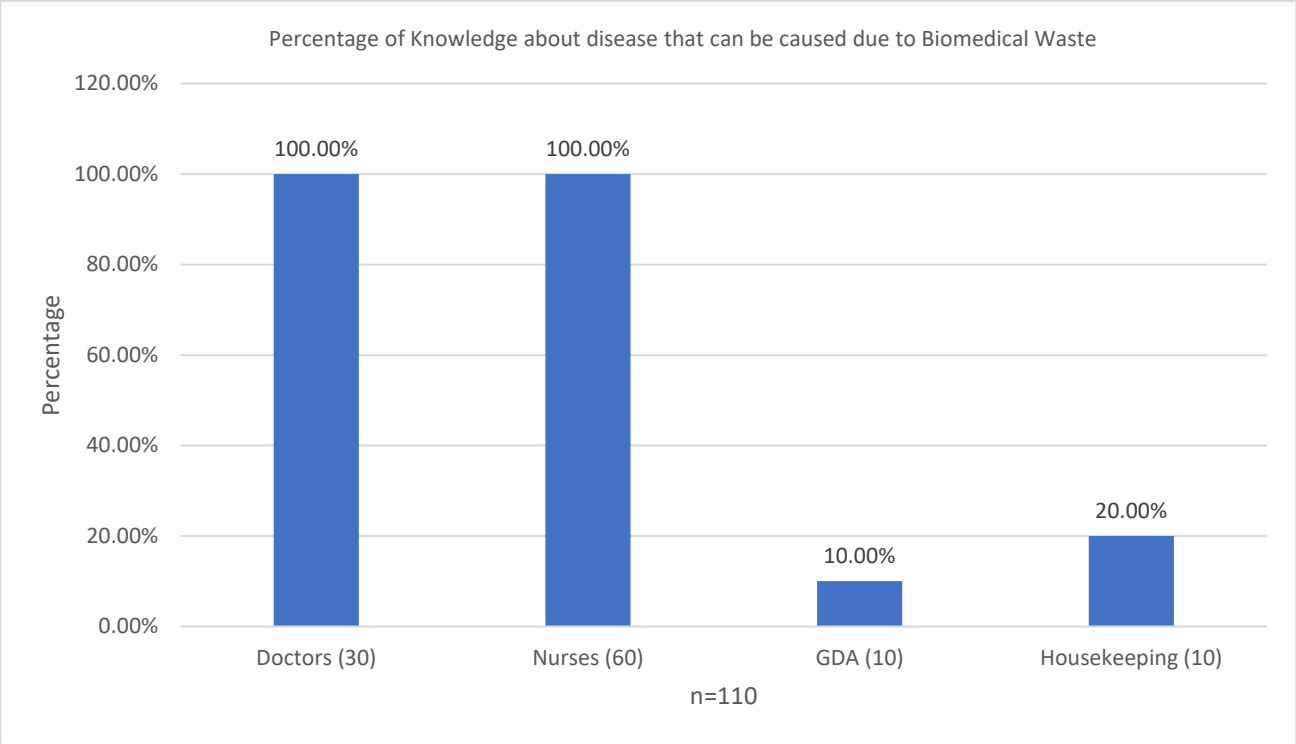

Figure 4.3 exhibits that knowledge about disease that can be caused due to Biomedical Waste were maximum among doctors and nurses and 20% and 10 % were in housekeeping and GDA staff respectively.

Figure 4.4Knowledge about the year in which Guidelines for the management and treatment of biomedical waste was established

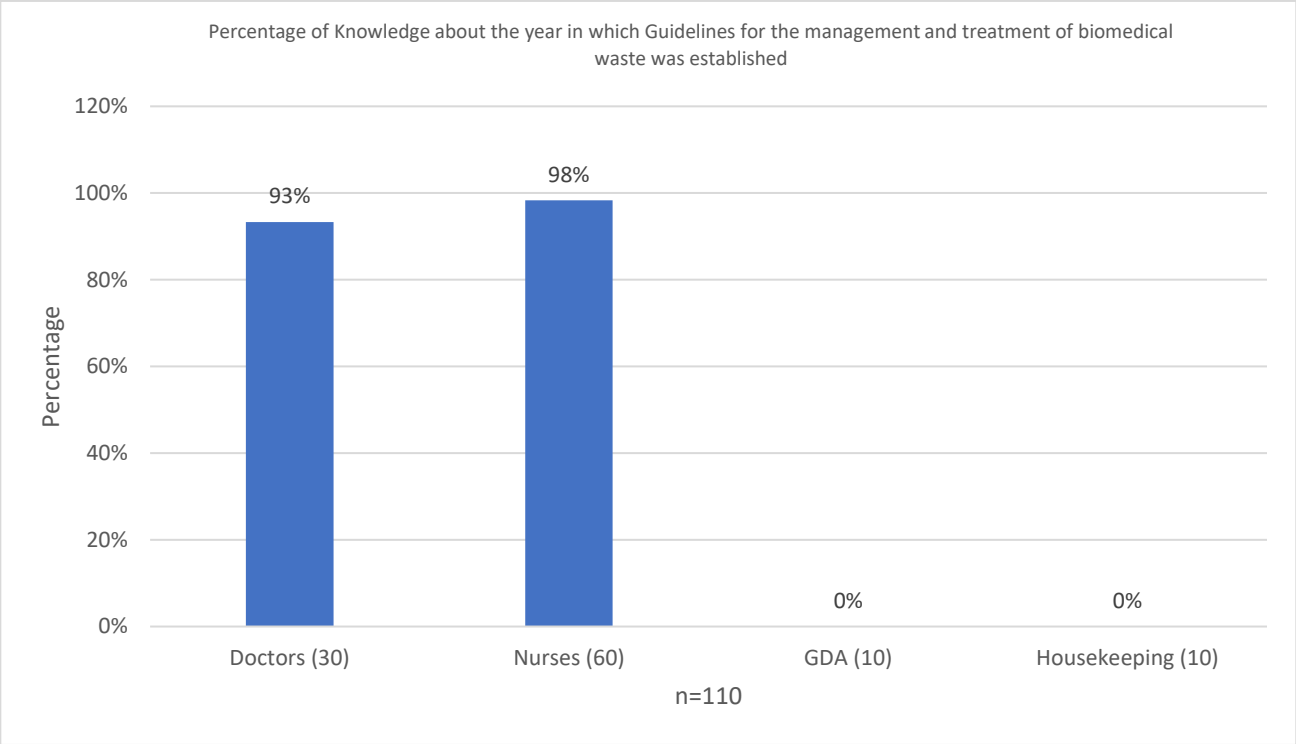

Figure 4.4 exhibits that knowledge about the year in which Guidelines for the management and treatment of biomedical waste was established was 98% among nurses, 93% among doctors. GDA and housekeeping staff did not have in depth knowledge about the guideline.

Figure 4.5Knowledge about method involved in the destruction of all microorganisms

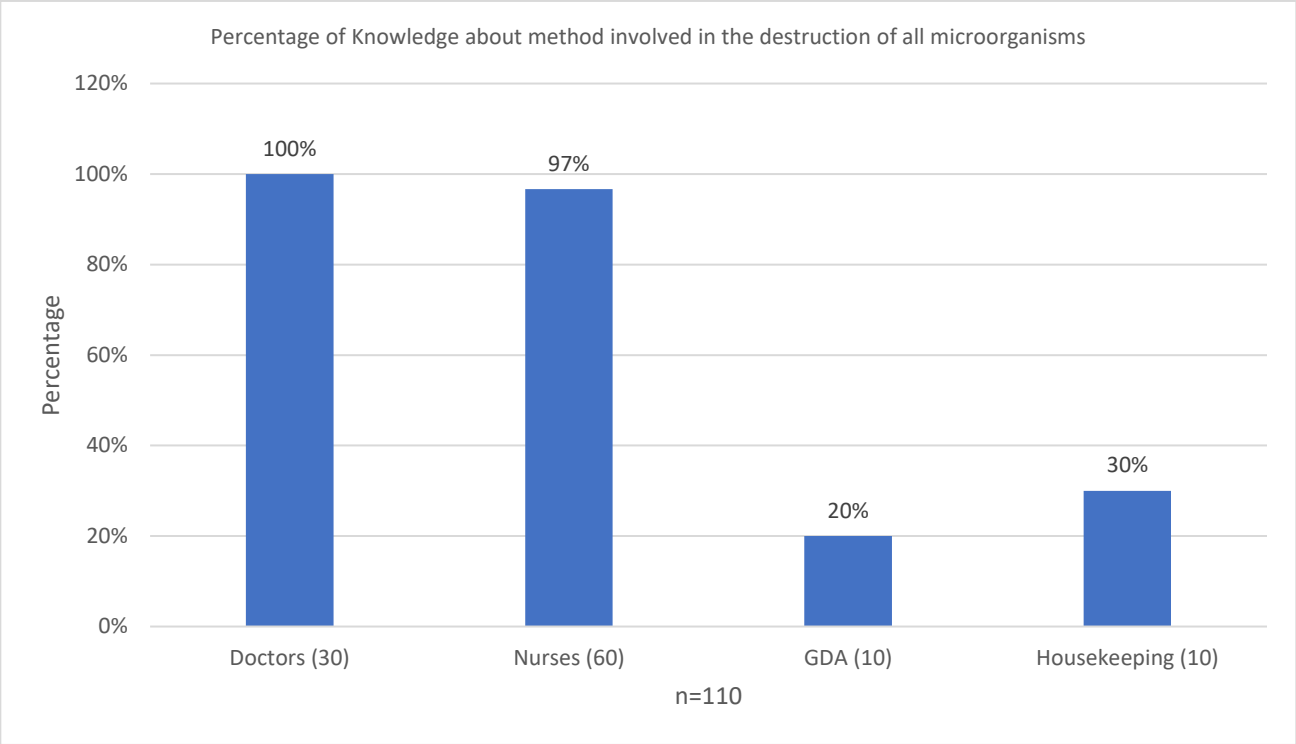

Figure 4.5 exhibits that knowledge about method involved in the destruction of all microorganisms was seen among all the doctors participated in the study, while 97% out of all nurses participated were aware about the same. Only 30% and 20% of Housekeeping and GDA staff were familiar about the sterilization method.

Figure 4.6Knowledge about different color-coded bins used in hospital for Biomedical Waste Management

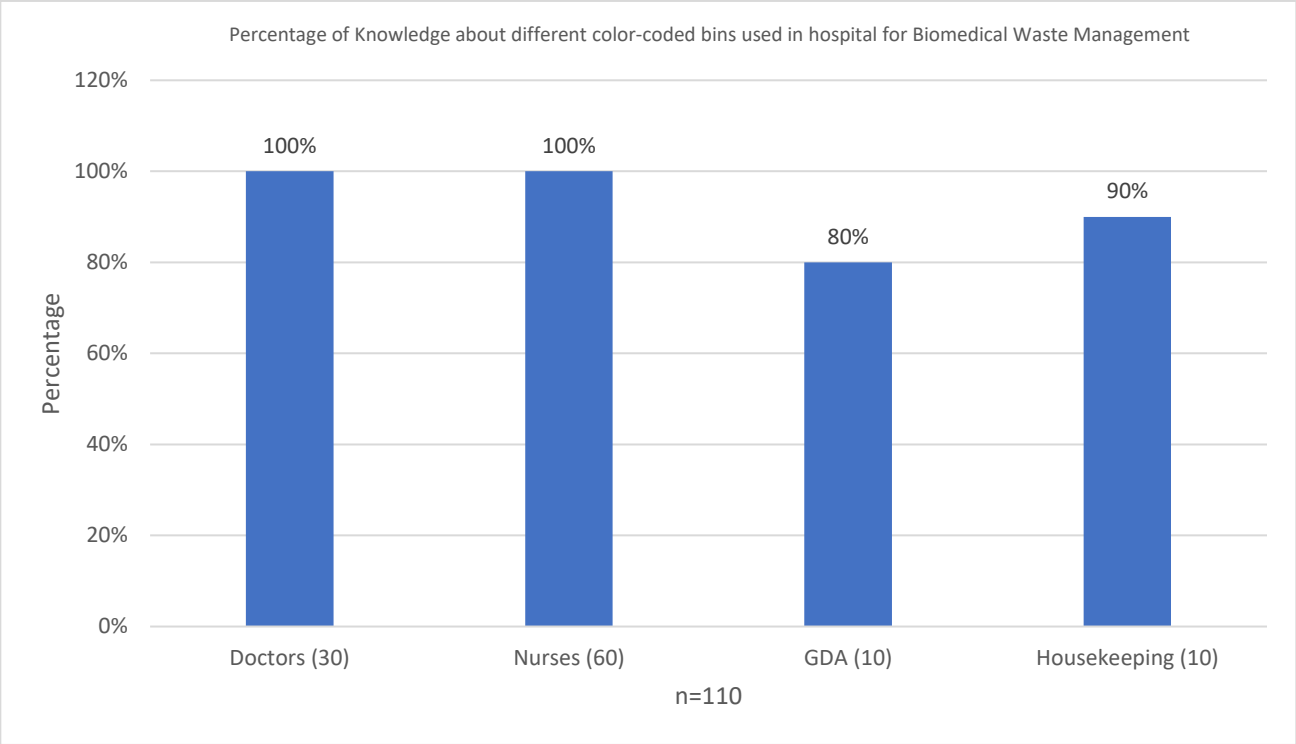

Figure 4.6 exhibits that 97% of the all the staff members participated in the study were aware about different color-coded bins used in hospital for Biomedical Waste Management. The graph depicts that the knowledge about the same was highest among doctors and nurses followed by housekeeping staff.

Mean score of knowledge for each cohort of staff i.e., Doctors, Nurses, GDA and Housekeeping was evaluated

Figure 4.7 Mean score of knowledge level of each cohort of staff regarding BMW

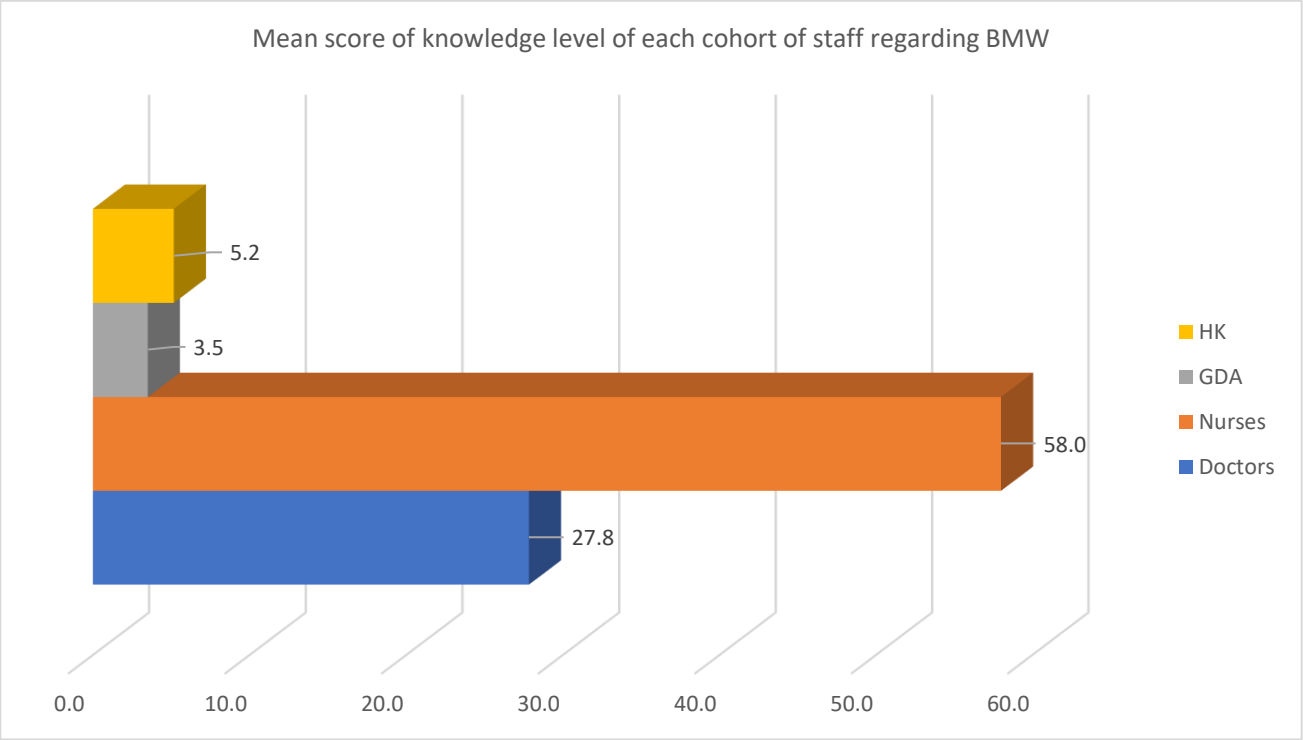

Figure 4.7 exhibits that the knowledge about BMW was assessed and the mean score was found to be highest among the nurses (58.0), followed by doctors (27.8). GDA (3.5) & housekeeping (5.2) staff showcased poor knowledge.

ASSESSMENT OF ATTITUDE

The questionnaire was evaluated and percentage about the degree of positive attitude was determined.

Figure 4.8Attitude of staff regarding BMW Management as a part of job.

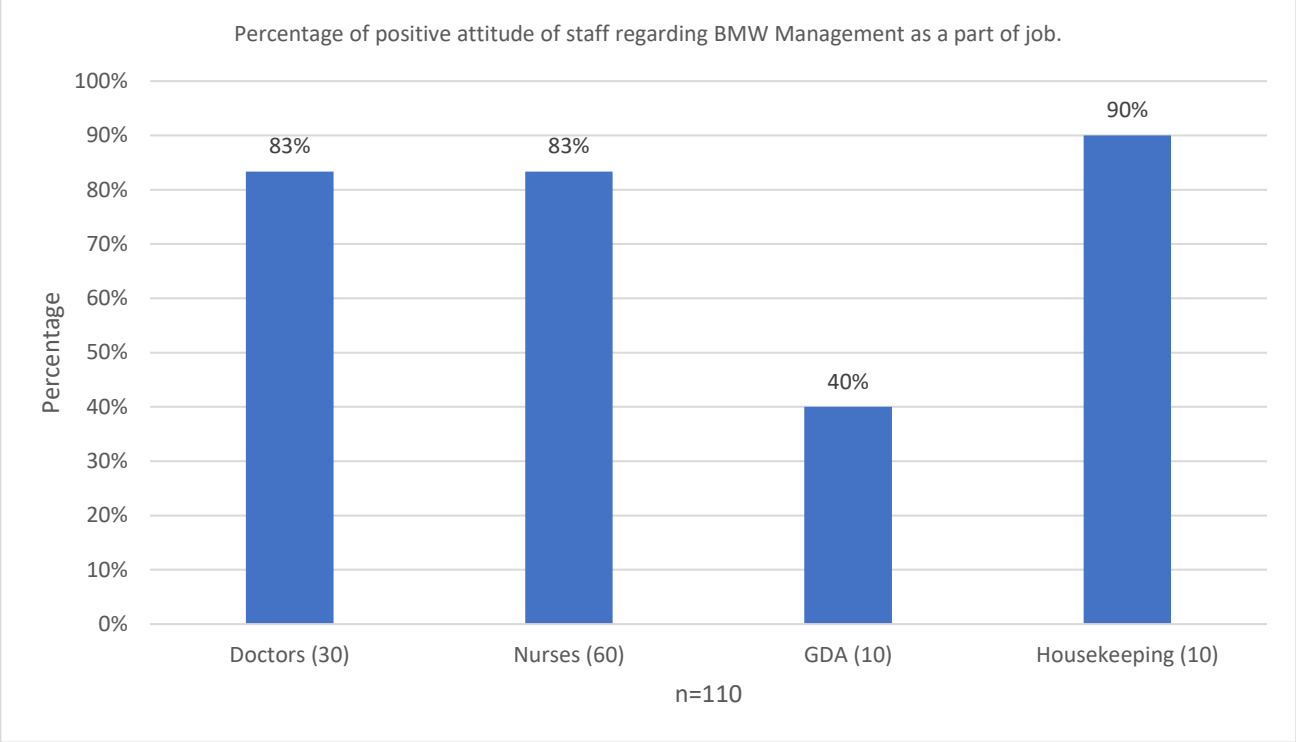

Figure 4.8 exhibits that the positive attitude of staff regarding BMW management as a part of their job was seen in 90% out of all the housekeeping staff participated in the study, 83% in nurses and doctors and 40% in GDA staff.

Figure 4.9Attitude of staff regarding Hospital policy for BMW management

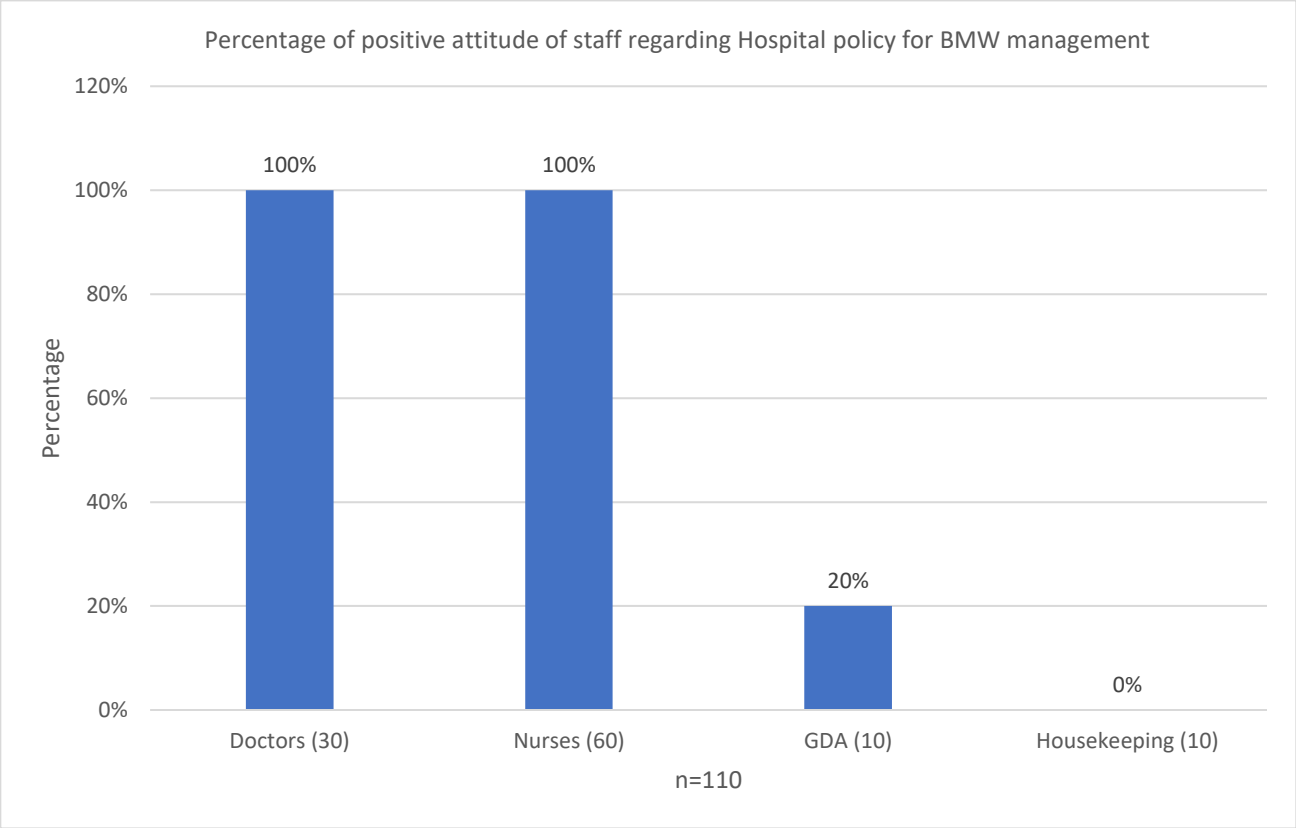

Figure 4.9 exhibits that positive attitude regarding the existence of hospital policy is necessary for effective biomedical waste management were only found in doctors and nurses. Housekeeping and GDA staff were not concerned whether the biomedical waste management is done in a systematic manner or not.

Figure 4.10Attitude of staff showcasing if they would like to attend programs that enhances their knowledge about waste management voluntarily

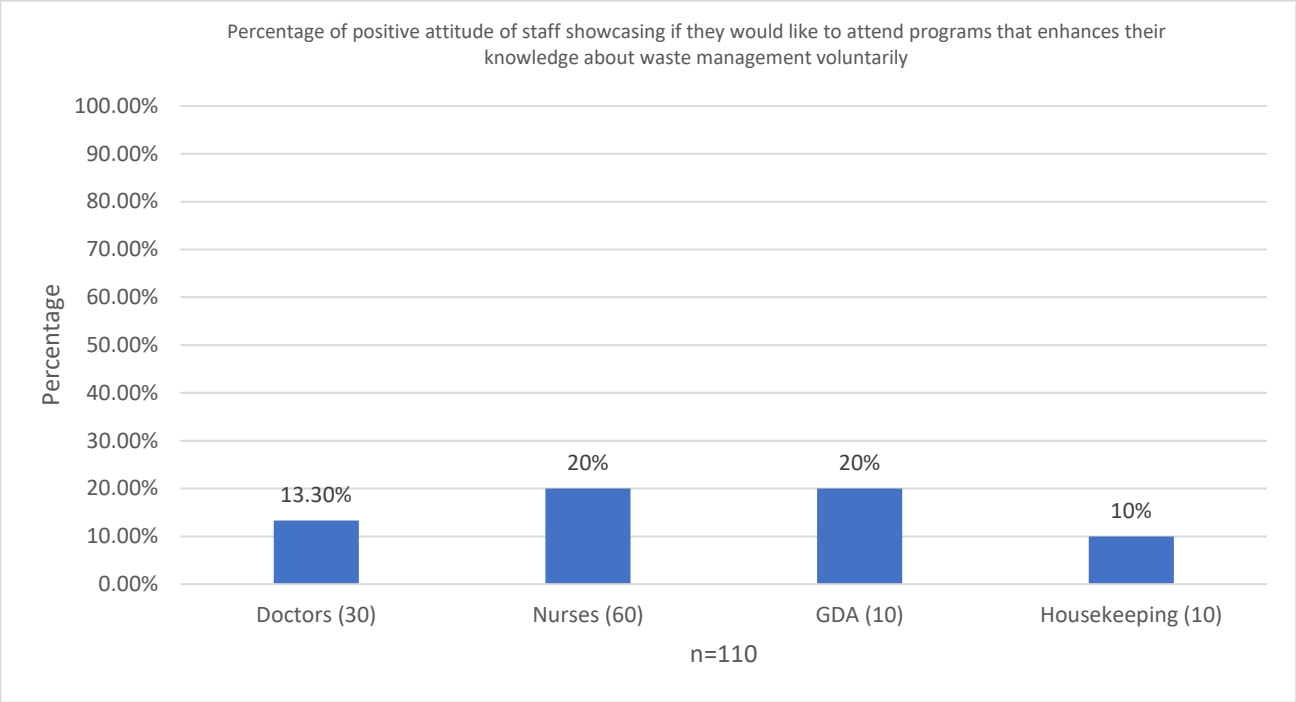

Figure 4.10 exhibits that how many staff were voluntarily wanted to attend the programs to enhances their knowledge about the biomedical waste management importance and significance. Only 20% of nurses and GDA, 10% of housekeeping and 13.3% of doctors out of total were interested to attend the programs.

Mean score of positive attitudes for each cohort of staff i.e., Doctors, Nurses, GDA and Housekeeping was evaluated

Figure 4.11Mean score of positive attitudes of each cohort of staff regarding BMW

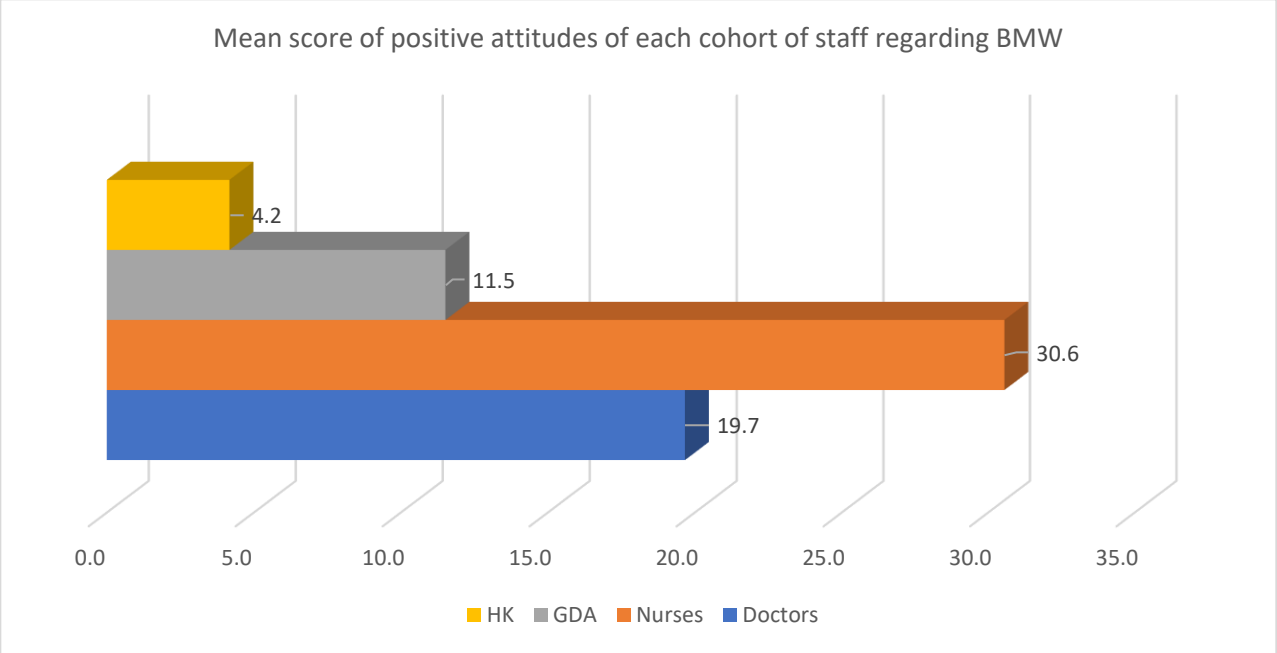

Figure 4.11 exhibits that the attitude of staff about BMW was assessed and the mean score was found to be highest among the nurses (30.6), followed by doctors (19.7). GDA (11.5) & housekeeping (4.2) staff showcased inappropriate attitude towards BMW management.

ASSESSMENT OF PRACTICES

The questionnaire was evaluated, and percentage about the degree of practices was determined.

Figure 4.12Practices of staff using PPE while handling Bio-medical waste

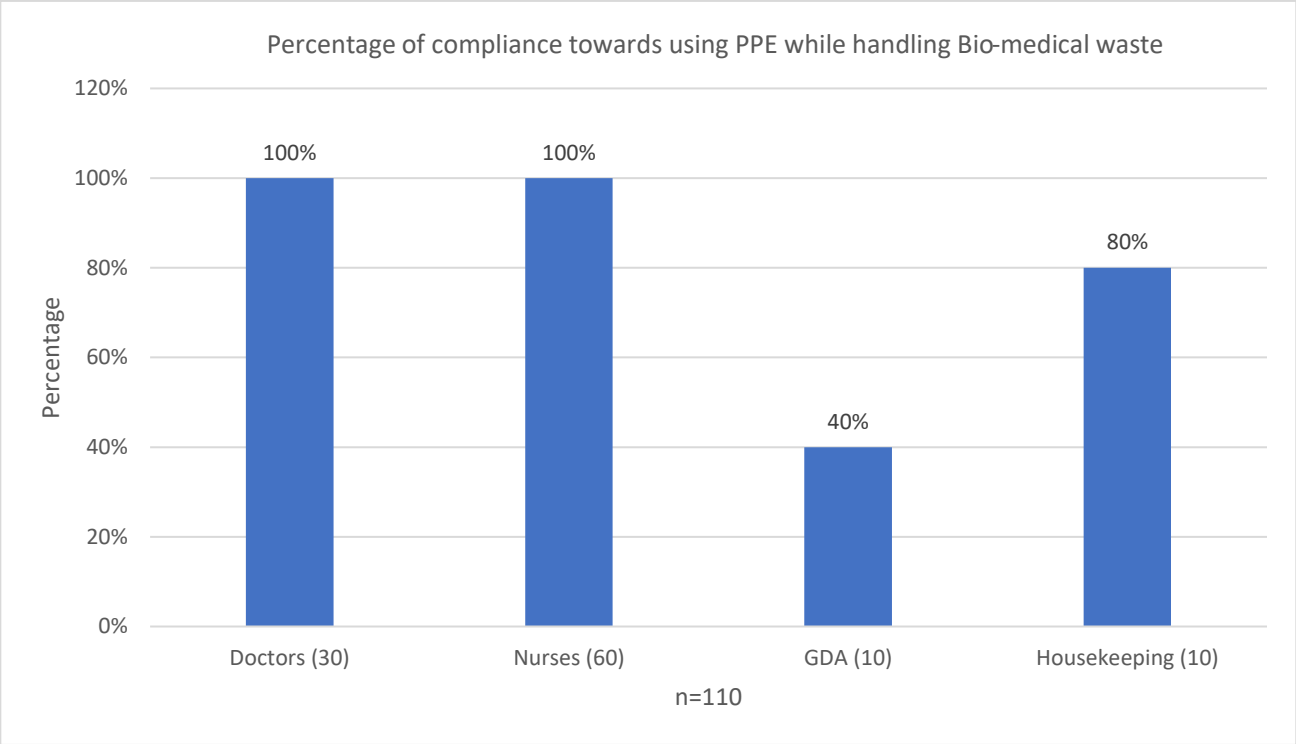

Figure 4.12 depicts that compliance of staff using PPE even after providing to the staff were 100% in doctors and nurses and 80% and 40% in housekeeping and GDA staff out of their respective cohorts.

Figure 4.13Practices of hand hygiene after handling Bio-medical waste

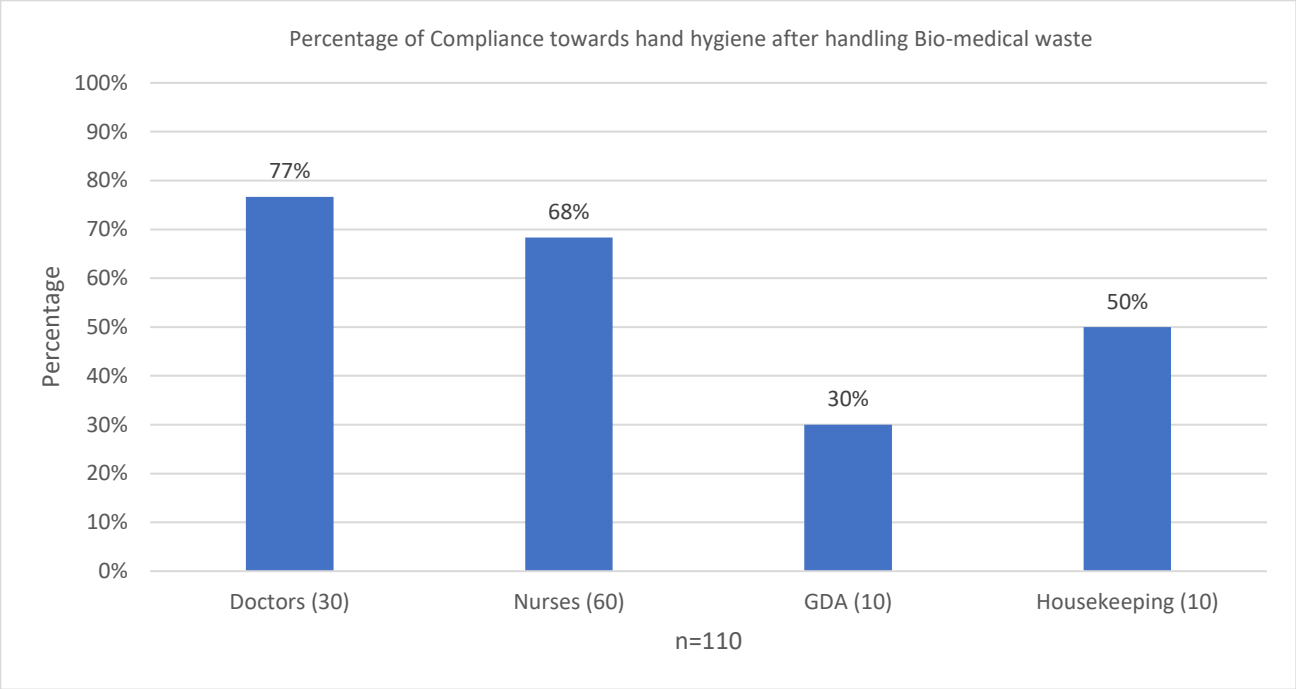

Figure 4.13 depicts the compliance of hand hygiene practices after handing biomedical waste were 77%, 68%, 30% and 50% in doctors, nurses, GDA and Housekeeping cohort respectively. The overall rate is low for hand hygiene because staff forgets to wash hands due to lack of time and heavy workload.

Figure 4.14Practices of Immunization

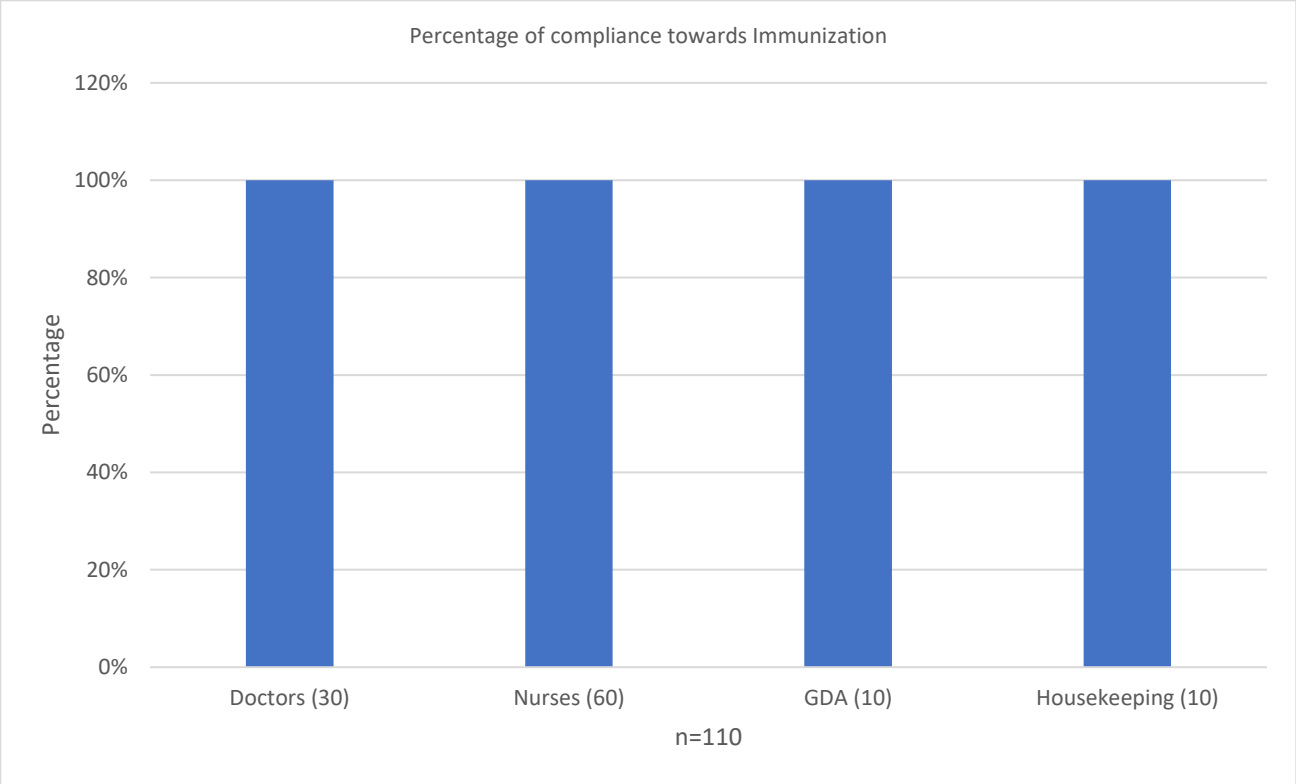

Figure 4.14 depicts that all the staff were immunized for hepatitis

Mean score of practices for each cohort of staff i.e Doctors, Nurses, GDA and Housekeeping was evaluated

Figure 4.15The mean score of practices followed regarding BMW.

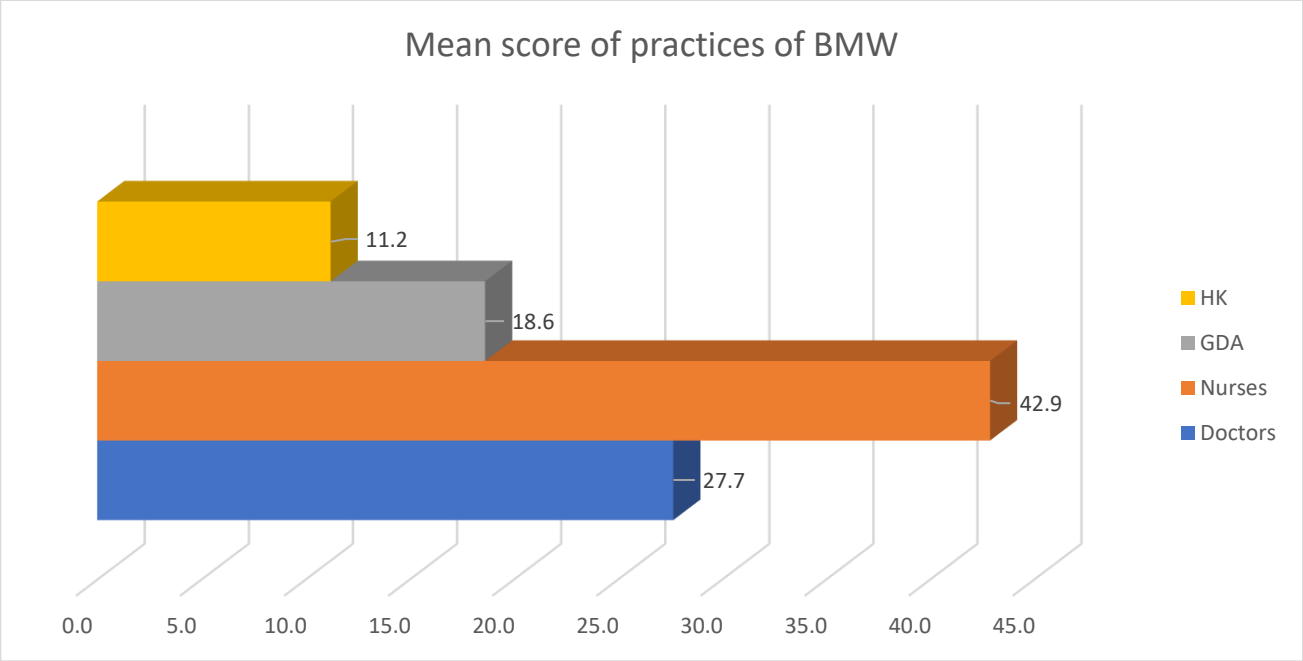

Figure 4.15 exhibits the correct practices of BMW management followed by the hospital staff and the mean score was found to be highest among the nurses (42.9), followed by doctors (27.7). GDA (18.6) & housekeeping (11.2) staff showcased low level of BMW practices.

Discussion

This study shows that doctors and nurses knew significantly better than the housekeeping and GDA staff conducted in the Rukmani Birla hospital (A unit of Calcutta medical research institute). When we talk about the assessment of knowledge among all the staff members it was seen that nurses had better knowledge among all the cadre taken in the study, followed by the doctors. The reason for this is due to the fact that constant training sessions are being conducted at the organization by the nursing in-charge for teaching and development of all the nurses. Whereas doctors due to their busy schedule were unable to take these training sessions. The relatively low knowledge levels of the housekeeping and GDA personnel were mostly attributed due to low level of their education. This study clearly signifies that the technical personnel were not having enough knowledge regarding the handling of biomedical waste management, this was identical to results from other similar studies conducted previously.

The attitude of staff corresponds to their level of knowledge. The study clearly shows as the housekeeping and GDA staff have low level of knowledge, their attitude towards BMW management is more casual as they fail to understand the severity of risks associated with improper handling of Bio-medical waste.

Regarding the practices, it was found in the study that the nurses having a positive attitude and high level of knowledge, due to their regular training sessions on knowledge and practices of Bio-medical waste management they incorporated good practices in their daily routine. Whereas the housekeeping and GDA staff when interviewed regarding the practices they followed, which involved questions pertaining to health risks it was found that they compromised safe BMW management practices with their health just to save time and complete tasks assigned to them. It was seen that even after providing the housekeeping and GDA staff with PPE equipment they didn't have the habit of using them in different steps of BMW disposal.

Conclusion

The study findings concludes that Knowledge, Attitude & Practices was seen to be the highest in nursing staff. Relatively low level of basic knowledge was seen among GDA and housekeeping staff due to their low level of education, leading to improper practices. Attitude of GDA and housekeeping staff was also seemed to be casual. It was seen that even after providing the housekeeping and GDA staff with PPE equipment they didn't have the habit of using them in different steps of BMW disposal as they failed to understand the severity of risks associated with improper handling of Bio-medical waste. The relevance of training in biological waste management cannot be exaggerated as inadequate understanding about this topic affects practices for effective waste disposal.

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Annexures

Questionnaire

Q1. For how long can we store Bio medical waste in the health-care facility?

a. 24hrs
b. 48hrs
c. 36hrs
d. 72hrs

Q2. Which of the following is symbol for Biohazard?

a. 
b. 
c. 
d. 

Q3. Which of the following disease can be caused due to poor handling of Biomedical waste?

a. Diabetes
b. Goitre
c. Hepatitis B
d. Meningitis

Q4. Guidelines for the management and treatment of biomedical waste was established in?

a. 1947
b. 1998
c. 2016
d. 1996

Q5. Which method is used to destroy all resistant spore forms?

a. Inceneration
b. Decomposition
c. Radiation
d. Sterilization

Q6. What are the different colour coded bins used in HCF for Biomedical Waste Management?

a. Red, Voilet, Black, Blue
b. Red, Blue, Yellow, White
c. Yellow, Red, Green, Blue
d. Blue, Orange, Purple, Pink

Q7. Do you consider Biomedical Waste Management as additional work

a. Yes
b. No

Q8. Should there be an SOP for Biomedical Waste Management?

a. Yes
b. No

Q9. Do you think hospital should organize a training session on Biomedical Waste Management?
a. Yes
b. No

Q10. Do you wear proper PPE equipment while handling Biomedical Waste?
a. Yes
b. No
c. Sometimes

Q11. Do you follow hand hygiene practices after handling Biomedical Waste?
a. Yes
b. No

Q12. Have you taken Hepatitis vaccination?
a. Yes
b. No