



A STUDY TO EVALUATE THE EFFECTIVENESS OF AN ORIENTATION PROGRAMMED ON KNOWLEDGE AND PRACTICE REGARDING BMW MANAGEMENT AMONG NURSES WORKING IN SELECTED TERTIARY LEVEL HOSPITALS OF JAIPUR RAJASTHAN”

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ABSTRACT

Waste management is the mainstay of hospital cleanliness, its hygiene and maintenance activities biomedical waste is extremely hazardous type of waste which poses serious health hazards.

To meet the needs of expanding population, the last century witnessed rapid mushrooming of healthcare establishments in both government and in private sector. With the advent, acceptance and increasing demand of “disposable items”, the present hospitals generate healthcare wastes in substantial amount. The absence of proper waste management, lack of awareness about the associated health hazards, human resources, insufficient financial and poor control of waste disposal are the main contentious issues connected with health care waste.

Inadequate, inappropriate and improper waste management leads to foul odor, environmental pollution, multiplication of disease carrying organisms like insects, rodents and worms and hence the transmission of diseases like typhoid, cholera, hepatitis A, B, C and AIDS through contact with infected waste and in particular through accidental injuries from used sharps. Owing to unsafe healthcare practices, half a million

people all over the world die every year due to infections like hepatitis B, and C, HIV and hepatic cellular carcinoma. Apart from these health risks, inappropriate management of healthcare wastes also has a negative impact on environment by adding toxic pollutants to water, air and soil. This environmental pollution can potentially damage our flora, fauna and the ecosystem. As per WHO statement 85% of hospital wastes are non hazardous while 10-15% is infectious. In India, the estimated figure of waste generation is 0.5- 2.0 kg/bed/day and out of this, 10 to 15 percent is found to be biomedical waste. India generates the highest amount of BMW in the world and is about 0.33 million tons per year

1. INTRODUCTION

. According to rules of biomedical waste (Management and Handling) 1998, it is any type of waste generated during the diagnosis treatment or immunization of human, animals or in research activities. The notification again specifies that the biomedical waste management is an integral part of maintenance of hospital hygiene and activities, so the attitude of health care workers is to be incorporated by good practices.

According to Medical Waste Tracking Act of 1988 medical waste is defined as "any waste that is generated as the result of diagnostic procedures, treatment, or immunization of human beings or veterinary, in research pertaining to, or for the production or testing of biological.

Adequate hospital waste management has become an important worldwide need today the long term effects of poor management is a humanitarian concern for public environment and health workers. So we have to sensitize ourselves and the personnel responsible for this issue in the interest of community.

The purposes of BMW management are prevention of transmission of diseases from patient to patient, patient to health worker and vice versa. Injury to the health workers and workers in support services can also result from improper waste management.

Apart from fear of health hazards the general public is very sensitive by the visual impact of body organs which are recognizable including fetus. It is unacceptable to dispose of these anatomical wastes inappropriately through landfill which is visible to public or approachable to stray animals. It is the moral duty of health care workers for preventing these types of practices. The pathogens or their spores which enter and remain suspended in the air inside the health care facilities for prolonged periods can result in nosocomial infections or occupational hazards. This can put the health workers, patients and their attendants at risk of contracting air borne infections. When untreated waste is transported outside the health care facility or dumped openly pathogens can contaminate drinking water food stuff, soil etc. Improper disposal of BMW in low- lying areas can contaminate water bodies and lead to severe water pollution through biological chemicals or radioactive substances.

As far as possible health care establishment should encourage purchase of reusable items made of glass and metal. Procedure and policies for proper management of waste generated should be adopted. Meticulous

segregation should be followed. The amount of waste generated at the source can be minimized through product substitution and good operating practices. Physical cleaning methods should be followed instead of chemical disinfection.

It is mandatory to train the nursing and housekeeping staff in the methods of proper segregation of waste. They must be educated about the different categories of waste and its management so that they may be able to distinguish between infectious and non-infectious waste and proper management of BMW can be practiced.

2. NEED FOR THE STUDY

Hospitals and other health care institutions are one of the essential the potential health hazards to health workers. Shockingly, hospitals claim off their wastes as per the stipulated norms, but most of the infectious waste including needles, syringes, catheters, etc. are being recycled only to find its way back into the market. Waste requiring special attention includes those that are potentially infectious sharps e.g. Needle, scalpels other subjects capable of puncturing the skin, plastic waste establishments, pharmaceutical waste and various other chemically hazardous waste used in laboratories.

One research study conducted in Delhi on 'Prevalence and Response to Needle Stick Injuries among Health Care Workers in a Tertiary Care Hospital' revealed that a large percentage (79.5%) of HCWs reported having had one or more NSIs during practice. The average number of NSIs among HCW was found to be 3.85 Per HCW ranging from 0-20. Avoidable practices like recapping needles contributed to the injuries. An important finding was that a majority of the injuries occurred during handling between use and its disposal rather than during use. While 60.9% washed the site of injury with water and soap, while 14.8% did nothing following even recent NSIs as an issue of distress and was not following injury reporting

India is the highest generator of waste and is estimated to be 1.5-2 kg/day/bed and out of which 10-15% is found to be bio-medical waste. In the state of Rajasthan, as per local and regional level studies it is presumed that most hospital generates 1-2 kg/bed/day and is about 40 tons per day. BMW disposal in Indian hospitals has become a burning issue of increasing concern prompting the hospital authorities to adopt the new ways of safe scientific and cost effective management of the same.

The health risk associated with hospital waste is due to infectious agents, toxic chemicals, sharps which renders highly infectious cytotoxic and radioactive. Each year a total of 1200 million infection i.e. 8-10 million Hep B, 2.3 - 4.7 million Hep C and 80,000 to 1, 60, 000 HIV infection are resulting from reuse of syringes and needles without sterilization.

3. OBJECTIVE

1. To assess the knowledge of nurses regarding biomedical waste management.
2. To observe the practice of nurses regarding biomedical waste management.
- 3 To plan and administer an orientation programmed on knowledge and practice regarding biomedical waste management
4. To evaluate the effectiveness of orientation programmed on level of knowledge regarding biomedical waste management among nurses.
5. To evaluate the effectiveness of orientation programmed on practice regarding biomedical waste management among nurses.
6. To find out the association of knowledge scores with selected socio demographic variables.
7. To find out the association of practice scores with selected socio demographic variables.
- 8.To find out the relationship between knowledge and practice of nurses regarding biomedical waste management.

ASSUMPTIONS

The nurses are having less knowledge regarding BMW Management.

The practice of nurses regarding BMW Management is poor.

Orientation programme will be helpful in enhancing the knowledge and practice of nurses on BMW Management.

4. HYPOTHESIS

H01: There will be statistically no significant difference between pre and post test knowledge scores among nurses regarding biomedical waste management.

H02: There will be statistically no significant difference between pre and post test practice scores among nurses regarding biomedical waste management.

H03: There will be statistically no significant association between pre test knowledge score of nurses with selected demographic variables.

H04: There will be statistically no significant association between pre test practice score of nurses with selected demographic variables.

H05: There will be statistically no significant relationship between knowledge and practice regarding biomedical waste management among nurses as a result of orientation program.

6. REVIEW OF LITERATURE

Effective and efficient methods of Biomedical Waste Management should be employed to prevent harm to human and environment. Injuries due to improper waste management may lead to infections to healthcare

workers and waste handlers. Hospital acquired infections can spread due to poor practices of infection control and waste management. To prevent hazardous effects of BMW, an efficient and technologically safe economically and culturally acceptable method of hospital waste management is to be identified.

An observational cross sectional study in a tertiary level hospital at Puducherry among 337 health care personnel by using a semi structured questionnaire was carried out. The results revealed that <50% of nursing staff and <25% of MPWS had the knowledge of color coding and segregation. Poor knowledge regarding disposal of sharps was observed, and had good knowledge regarding disease transmission through improper biomedical waste handling. The study again revealed that there was a need for continuing training programmes on BMW and administration needs to put protocols, by providing required resources for practicing bio-medical waste management as per rules.

Case study conducted in a health care facility with 550 beds, 42 wards and 20 OPDs associated with a medical college generated 0.5-2 Kg. waste/day/bed. Overall generation of waste was 687 Kg. /day out of which 71.6 Kg sent for incineration and 120 Kg sent for landfill. Only 192 Kg of waste need to be take care with additional precautions. No infectious waste was stored beyond 24 hrs. Study concluded that pathogenic waste, sharps and infectious waste can be send for plasma pyrolysis, were no additional treatment is required for leftover and will be useful to safeguard the environment.

A study on evaluation of awareness programme on practices of bio-medical waste management at leading hospital in Ahmadabad among hospital staff revealed that conduction of training workshops on bio medical waste management for hospital staff has shown providing results in practicing bio medical waste management. The study recommended periodic training workshops on bio medical waste management to reinforce and improve knowledge of health care workers for proper implementation and management of bio medical waste.

A cross sectional study to assess awareness of bio medical waste management among 116 medical staff, 72 staff from paramedical and 58 from sanitary staff of a teaching hospital, M.P, concluded that awareness of hazards associated with bio medical waste management and handling was 95.83%, prevention of hazards(93.05%), color coding(61.1%), segregation(51.38%), transportation, open unused sharps are not considered as bio medical waste(41.67%), knowledge regarding storage (43.05%), about total waste generated in a hospital is hazardous(25%). The study concluded in service education to nursing staff for improvement in knowledge and practice.

A study on awareness regarding biomedical waste management among doctors, paramedical staff and non medical staff in a district of MP, revealed that practices of waste management in hospitals were grossly inadequate. The study recommended orientation and re-orientation training programmers for health care

workers and strict implementation of guidelines in a strict manner of BMW management to protect themselves and hospital visitors.

A KAP study on bio-medical waste management of the staff at a tertiary level hospital and observed that, the laboratory staff was found to have recorded lowest in all the three aspects. The findings showed that they never informed the staff in the form of guidelines or instructions and not supervised their Bio-medical waste management practices. On further processing and analysis it was observed that the laboratory technicians and nursing staff showed least of interest to know more about the system of bio-medical waste management and they expressed that it is the responsibility of hospital management providing direct patient care. The study respondents felt need for training and publicity of the issue.

Infection prevention and Occupational exposure posed by BMW

A cross sectional study focusing on awareness of health workers regarding hospital waste management in health care facilities which was focused on CPCB rules training status, maintenance report and accident reporting system among 71 health care facilities. It was observed that of the 71 health care facilities under study 42.2% of health care facilities were registered with SPCB only 4.2% of health care facilities had trained staff, 39.4% of all health care facilities were maintaining reports related to waste management and none of the facilities had occupational exposure reporting system. The present study revealed gross inadequacies in most of the health care facilities regarding proper waste management system.

A study conducted as management & universal precaution regarding BMW among health care personnel working in a PHC area found that that only 33.3% respondents knew that there is a legislation regarding the management of bio-medical waste. Only 85.71% were aware of the common types of wastes disposed and 82.5% were able to identify color codes of bins for waste disposal. Only 53.9% had proper knowledge regarding all the ten categories of biomedical waste. Correct knowledge regarding Universal Precautions was found among 57.14% health care personnel. Only 39.7% were following safe injection practices and all respondents (100%) were vaccinated for prevention of Hepatitis-B. Awareness of PEP against HIV was among 50.79%. Only 52.3% were having knowledge regarding spillage of body fluids and its management. In a total of 63 health care personnel 33.33% participants underwent training on bio-medical waste management at least once previously, the necessity of training with a periodic follow-up and monitoring was highlighted.

A study was carried out on knowledge, attitude, and Practices existence among doctors and nursing staff in a teaching hospital showed that the existence knowledge of regarding BMW (management & handling) rules was higher among doctors (68.5%) than in the other categories, none of the sanitary staff were aware of bio-medical waste rules. A majority of the nurses (73%) could identify the biohazard symbol unlike others. medical waste management compared to other categories but regarding disposal of sharps in blue container was found less, puncture proof containers (31%) in which other categories had better

knowledge. Only 16% of the sanitary staff was aware of the diseases transmitted by bio-medical waste. Practice regarding BMW management revealed that majority of the nurses and lab technicians had favorable practices than the other groups, particularly the practice of disposing sharps in blue colored puncture proof containers. One of the important risk factors for needle stick injuries was high among nurses and paramedical staff and found highest among physicians (70%) due to recapping of needles. However, injury reporting was low across all the categories of health care workers. The knowledge of doctors was better compared to their practices whereas poor for nursing staff and laboratory staff. Knowledge level was low on all counts among sanitary staff; one of the important risk factor for NSI was found high (67%) among all three groups. This may be contributed to poor awareness, also informal consultations revealed lack of adequate number of needle cutters in the hospitals.

A descriptive study on knowledge and awareness of needle prick injury among dental college students, Maharashtra, India revealed that 74% students knew that needle stick injuries result in contact of blood-borne infection like Hepatitis B virus (HBV), Hepatitis C virus (HCV), and HIV. Regarding awareness of students towards management of needle stick injury, the overall average percentage of correct response was 91.55%. About 89% of participants agreed that Post-Exposure Prophylaxis (PEP) should be initiated within a period one hour of the exposure. A majority (96%) of participants believed that most injuries occurred during disposal of sharp and higher (96%) of participants were aware that blue bag is used for disposal of waste sharps. The study also revealed that injuries from sharp objects and used needles among healthcare workers were a widespread occupational hazard.

7. METHODOLOGY

A research methodology defines what the activity of researcher is, how to proceed, how to measure progress and what constitute success. Research methods are the steps, procedures and strategies for gathering and analyzing the data in a research investigation. This Chapter deals with the methodology used to administer and evaluate the effectiveness of an orientation programme on knowledge and practice regarding biomedical waste management among Nurses Working in Selected tertiary level tertiary level hospitals of jaipur district, Rajasthan.

Chapter includes the brief description of the different steps that were undertaken by the investigator for the study. It is discussed under the following headings : the research approach, research design, population, sample, setting, sampling technique, selection criteria, description of tools, data collection procedures, plan for data analysis and interpretation of the data.

RESEARCH APPROACH

Research approach is a systemic objective method of discovery with empirical evidence. The research approach spells out the basic strategies that the researcher planned to develop information that is accurate

and interpretable. An evaluative research approach was considered appropriate for the present study because the primary objective of the study was to evaluate the effectiveness of an orientation programme on biomedical waste management.

RESEARCH DESIGN

It is the overall plan for obtaining answer to the questions being studied and for managing some of the obstacles arised during the research process. To accomplish the objectives of the study a Quasi-experimental design with one group pre-test post-test was selected.

Quasi-experimental research is similar to experimental research and in that there is manipulation of independent variables. There is no control group and random assignment was used to select subjects. All subjects were given pre-test, intervention and post-test and were analyzed for difference. In this study, a single test group was selected and the knowledge and practice on bio medical waste management was measured before the introduction of orientation programme. After the orientation programme level of knowledge and practice were reassessed by conducting post-test.

ANALYSIS DESIGN:

Data analysis is the technique used to reduce, organize and give meaning to the data. In the present study the data obtained were analyzed on the basis of objectives of the study using descriptive and inferential statistics. A master data sheet was prepared by putting the responses given by the participants. The plan for data analysis was as mentioned below Distribution of respondents according to socio demographic variables

Mean, SD and mean percentage were used to describe the area wise pre and post test knowledge scores of the respondents for knowledge and practice regarding BMW management.

Paired 't' test was used to find the effectiveness of orientation program comparing pre and post test knowledge and practice scores of the respondents

'F' value, 'z' value was calculated to find the association between knowledge and practice scores with demographic variables.

8. ANALYSIS AND INTERPRETESION

Description of socio-demographic characteristics

This section discuss with distribution of the respondents according to socio- demographic characteristics which were described as age in years, gender, educational qualification, area of work, year of experience, type of health care organization and area of residence.

Table-2 Distribution of Respondents According to Age

N=708

Age	N	%
20 - 29 years	219	30.93
30 - 39 years	185	26.13
40 - 49 years	220	31.07
50 years & Above	84	11.86
Total	708	100.00

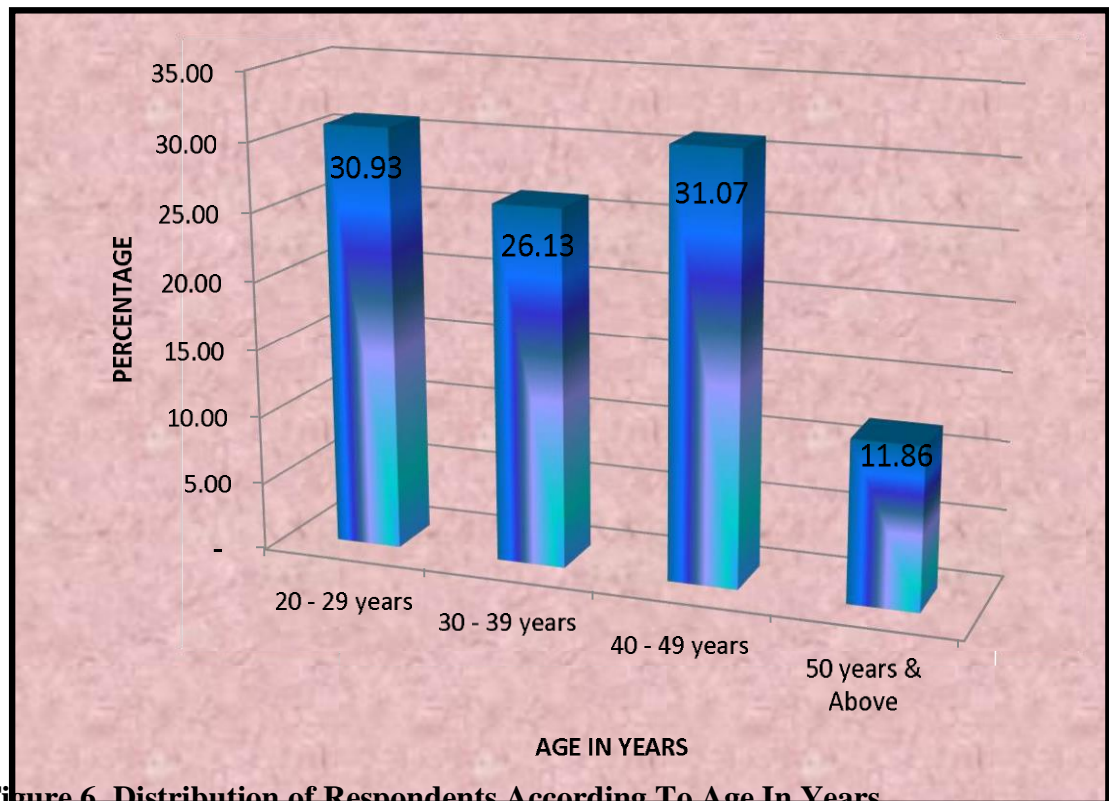


Figure 6. Distribution of Respondents According To Age In Years

Table 2 and Fig.5 depicts that majority (31.07%)of respondents were in the age group of 40-49 years and almost equal percentage (30.93%) were in the age group of 20-29 years. 26.13% were in the age group of 30-39 years and only 11.86% respondents were in the age group of 50 years and above.

Table-3 Gender Wise Distribution of respondents

N=708

Gender	N	%
Male	303	42.80
Female	405	57.20
Total	708	100.00

Table 3 and Fig-6 depicts that majority 57.20% of respondents were female and 42.80% were male nurses.

Table-4 Distribution of respondents according to Educational Qualification

N=708

Education	N	%
Diploma	357	50.42
Graduation	271	38.28
Post Graduation	80	11.30
Total	708	100.00

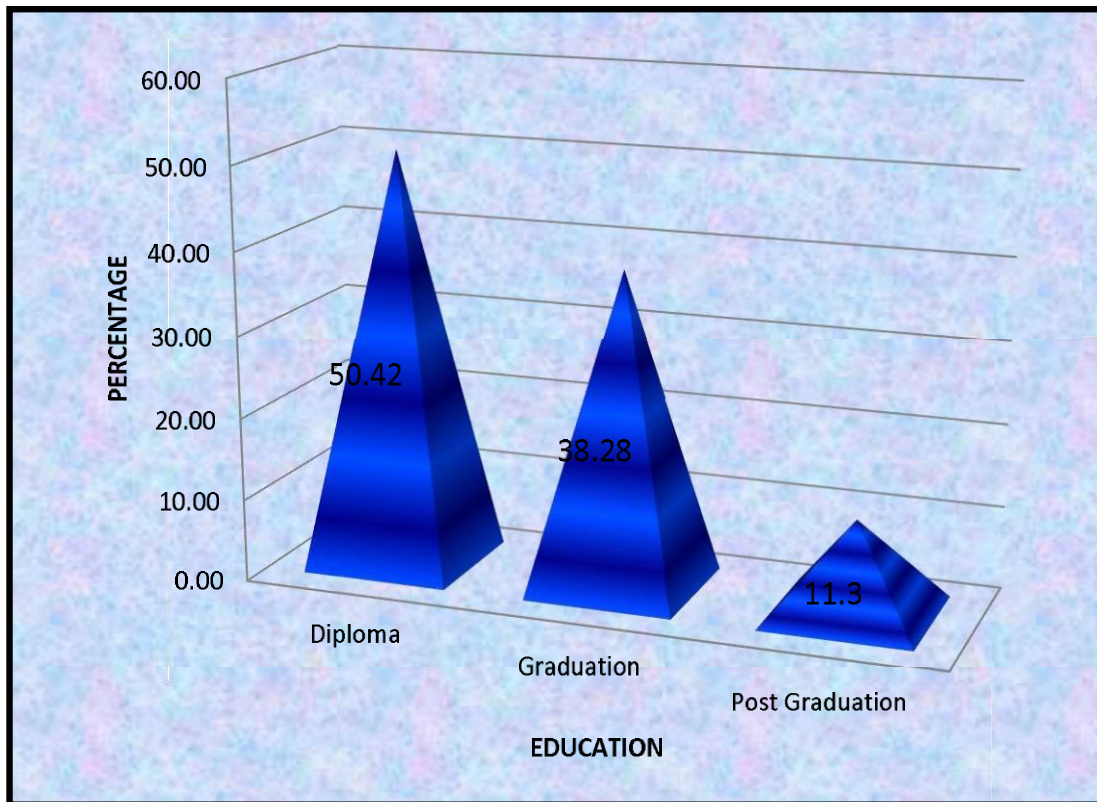


Figure 8. Distribution of respondents according to Educational Qualification

Table 4 and Fig-8 depicts that majority 50.42% of participants were diploma holders, 38.28% were graduates and only 11.30% of respondents were post- graduates.

Table-5 Distribution of respondents according to Area of Work

N=708

Area of Work	N	%
Medical	142	20.06
Surgical	92	12.99
Maternity	151	21.33
Operation Theater	149	21.05
Pediatric department	54	7.63
Others	95	13.42
No Response	25	3.53
Total	708	100.00

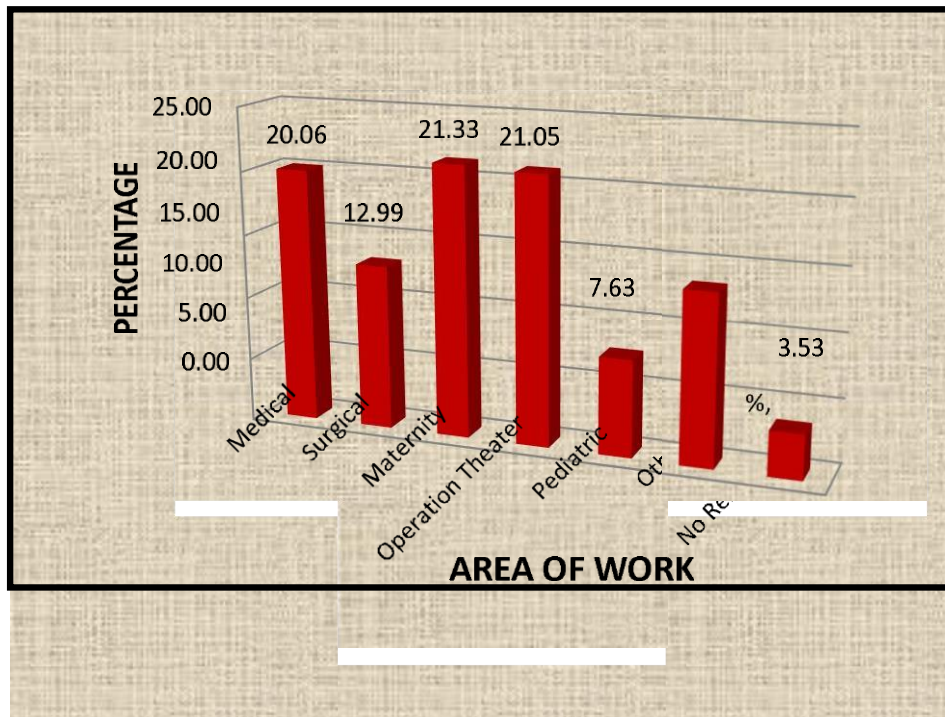


Figure 9. Distribution of Respondents According To Area of Work

Table 5 and Fig-9 Depicts that equal percentage 21% of respondents were from maternity dept. and operation theatre 20.06% of participants were from medical wards, 13.42% from other depts. (labs, OPDs, injection room etc.) 12.99% from surgical wards and only 7.63% were from pediatric department and 3.53% of participant were not respondent.

Table-6 Distribution of respondent according to year of Experience

N=708

Year of Experience	N	%
< 1 year	45	6.36
1 - 5 years	118	16.67
5 - 10 years	157	22.18
10 years & Above	388	54.80
Total	708	100.00

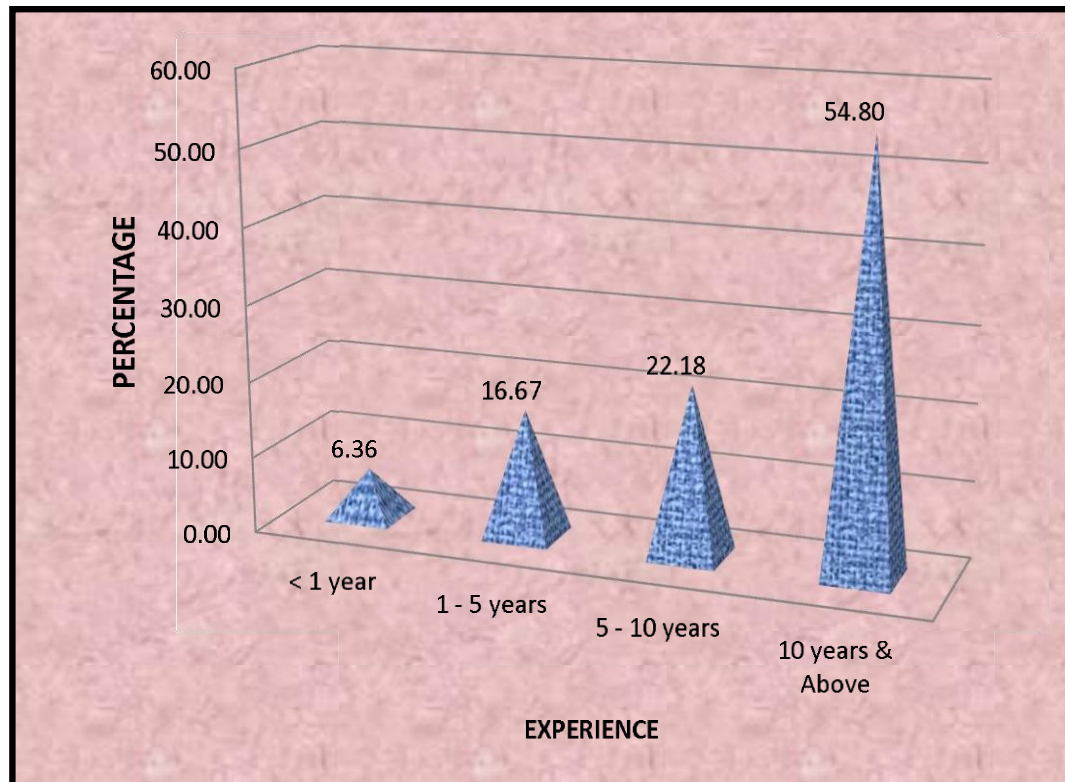


Figure 10. Distribution of Respondents According To Year of Experience

Table 6 and Fig-10 depicts that majority 54.80% of respondents were having 10 years and above experience, 22.18% of participants were having 5-10 years, 16.67% were having 1-5 years and 6.36% of respondents were having less than 1 year experience.

Table-7 Distribution according to Type of Health Care Organization

N=708

Type	N	%
Public	491	69.35
Private	217	30.65
Total	708	100.00

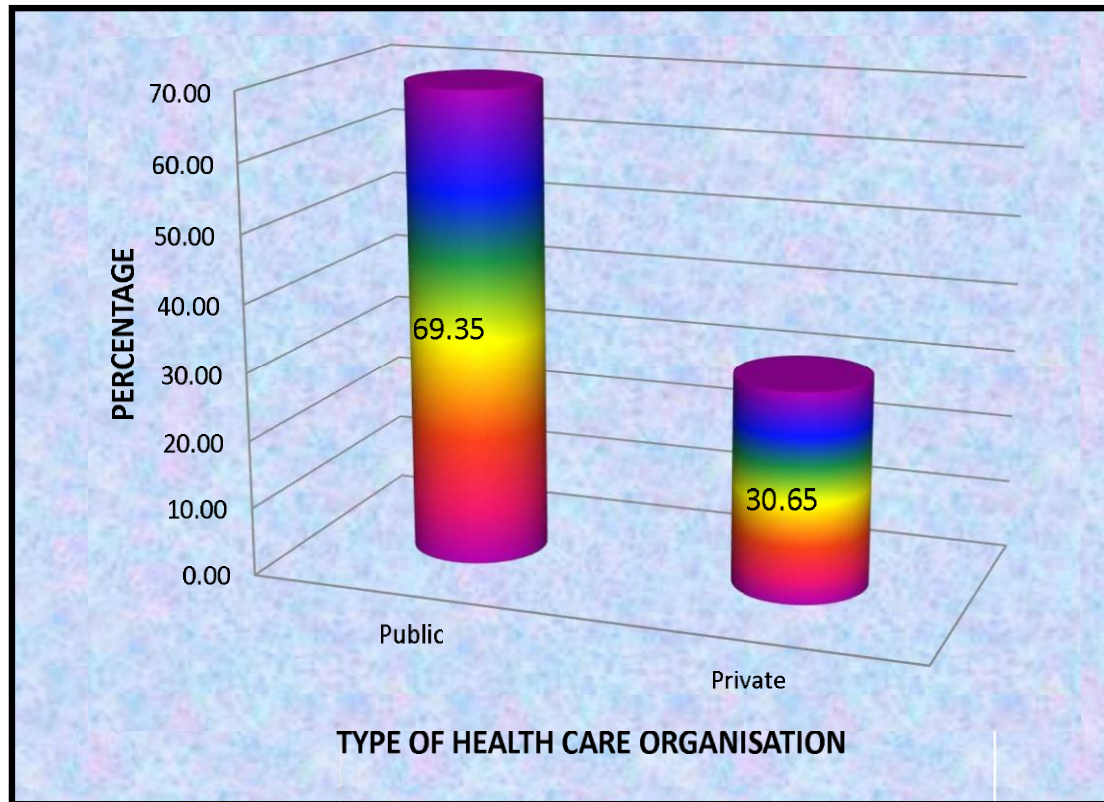


Figure 11. Distribution of Respondents According To Type of Health Care Organization

Table 7 and Fig-11 Depicts that majority 69.35% of respondents were from public sector hospitals whereas 30.65% were from private sector hospitals.

Table-8 Distribution of respondents according to Area of Residence

N=708

Area of Residence	N	%
Urban	383	54.10
Rural	325	45.90
Total	708	100.00

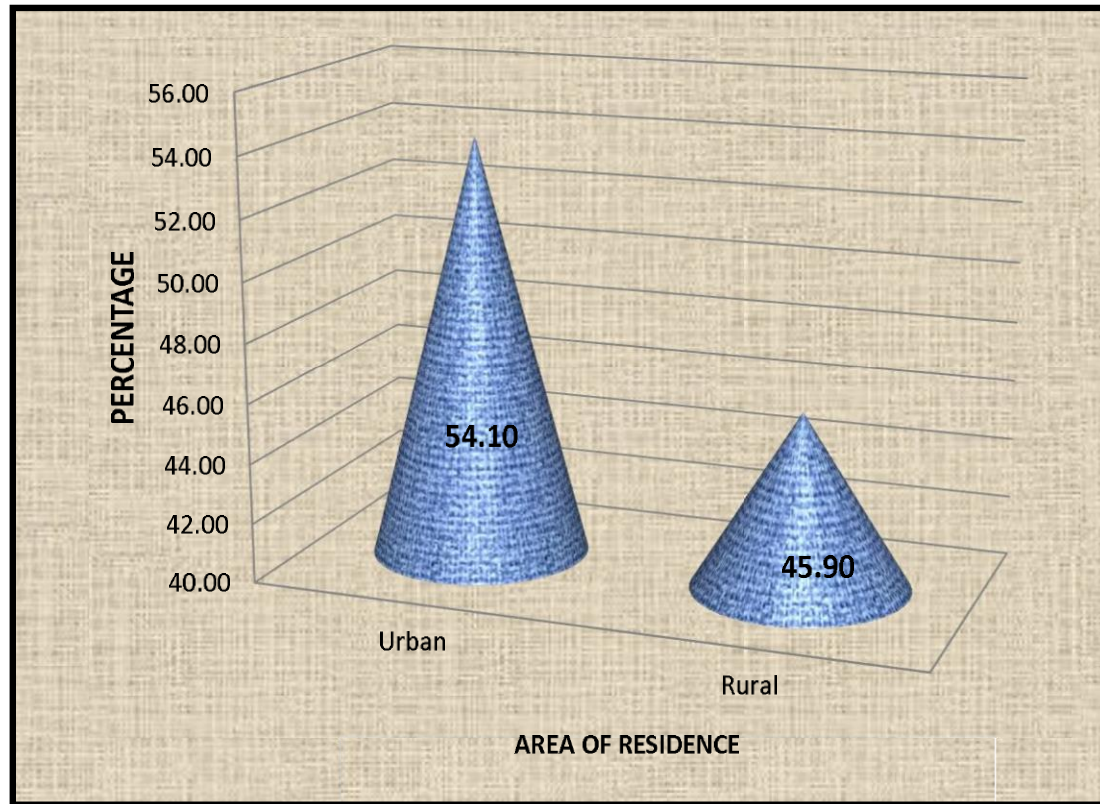


Figure 12. Distribution of Respondents According To Area of Residence

Table 8 and Fig 12 depicts that 54.10% of participants belong to urban area whereas 45.90% of participants were residents from rural area.

10. CONCLUSION

Age: Table 2 depict that majority (31.07%) of participants were in the age group of 40-49 years and almost equal percentage (30.93%) were in the age group of 20-29 years. 26.13% were in the age group of 30-39 years and only 11.86% of participants were in the age group of 50 years and above. The findings of study revealed that recruitment of staff in the selected public sector from where majority of the sample were selected hospital was done after a long duration as majority of the participants were in the age group of 42-49 years. Similar findings were mentioned in the study conducted by Dr. Manoj Dudi in 2014 in Jaipur district.

Gender: Table 3 depicts that majority of the participants were female (57.20%) whereas only 42.80% respondents were male. The findings shows that although there are cultural restrictions in Rajasthan with regard to female going for job, the city like Jaipur which comes under tribal belt does not have any impact of those restrictions. Similar findings were seen in the study conducted by Md. Asadulla & Karthik (2013) among nursing staff in which the majority of participants (96.4%)

Educational Qualification: Table 4 depicts that majority 50.42% of participants were diploma holders,

38.28% were graduates and only 11.30% of respondents were post-graduates. The findings revealed that there is a lack of higher education in nursing in Rajasthan state or most of the graduates and post-graduates nurses moves towards education side rather than clinical side. The findings corresponded with the study conducted by Kartik G.K. & Dharmappa B. 2013 to assess the KAP regarding BMW management among nurses in which the majority of respondents were diploma holders. It is also noticed that in most of the studies conducted among nursing staff majority of the participants were female.

Area of work: Table 5 depicts that equal percentage (21%) of respondents were from maternity dept. and operation theatre 20.06 of participants were from medical department, 13.42% from other dept. (labs, OPDs inj. room etc). 12.99% from surgical wards and only 7.63% were from paediatric departments. Similar findings were seen in the study conducted by Savan Sara Mathew 2011 to assess the Bio medical waste management among 378 nurses in teaching hospitals at Ludhiana. Majority (37%) of the participants were from maternity department.

Year of experience: Table 6 depicts that majority 54.80% of respondents were having 10 years and above experience, 22.18% of participants were having 5-10 years, 16.67% were having 1-5 years and 6.36% of respondents were having less than 1 year experience. The findings of the study corresponded to the study conducted by Mukesh Kumar & Rajesh Singh 2015 in Nainital revealed that majority 131 (59.5%) of the participants were having more than 5 years of experience whereas the remaining 40.5% had below 5 years of experience.

Type of health care organisation: Table 7 depicts that majority 69.35% of respondents were from public sector hospital whereas 30.65% were from private sector hospitals. The findings may be due to the reason that the selected public tertiary level hospital had the highest number of samples comparing to other private tertiary hospitals selected for the present study.

Area of residence: Table 8 depicts that 54.10% participants belong to urban area whereas 45.90% of participants were from rural area. This may be due to the migration of resident of rural area towards urban areas for education purpose.

RECOMMENDATIONS

Nursing protocols should be framed for every step of BMW management process specifying the role and responsibilities of the health personnel.

Nursing staff should be sensitized for segregation of waste at the point of origin and minimization of waste.

Use of PPE during patient care and handling BMW should be assured.

Reporting of occupational exposure to the concerned official and get treatment as per protocol of the health care institution

It should be made mandatory for all nurses to undergo CME, orientation

programmes and workshops for updating knowledge on BMW management.

Protocols related to waste management process should be displayed in all clinical departments where patient care and diagnostic procedures are carried out.

Periodic training programmes can be organized for the nursing staff to update the knowledge and practice aspects.

An experimental study can be conducted with a control group.

A comparative study can be carried out for staff working in public and private health care institutions.

The knowledge and practice of nurses can be enhanced through various interventions like STP, SIM, demonstration methods.

It can be made compulsory for hospital authorities to get trained their health care personnel in every 6 months for improvement and effectiveness in BMW management.

Positive reinforcement can be given to HCW who is practicing biomedical waste properly.

NURSING IMPLICATIONS

Effectiveness and scientific management of BMW management has become a public issue. Lack of interest, poor self motivation of HCW and lack of awareness are the major problems associated with waste management in health care institutions. To protect the environment and public there should be a uniform pattern in the health sector regarding BMW management. The lack of appropriate waste disposal can lead to health hazards. Proper handling treatment and final disposal is an integral part of waste management. The nurses should also train to reduce waste generation during treatment and diagnostic procedures through waste minimization.

The findings of the study has implications in the area of nursing practice, nursing education, nursing administration and nursing research

11. DELIMITATIONS OF THE STUDY

The sample size is restricted due to administrative constraints.

The study is limited only to the nurses working in selected tertiary level hospitals.

The limited sample size of nurses limit the generalization of the study findings

The study limited to specific geographic area of east Rajasthan limits the generalization.

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