Assessment of Knowledge, Attitude and Practice of Healthcare Workers towards Management of Biomedical Waste: A Cross-Sectional Analytical Study.

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ABSTRACT:-

INTRODUCTION: Biomedical waste as the name suggests is the waste generated as a result of various activities and processes in Medical and Healthcare field. It is the outcome majorly because of patient care, treatment, surgical procedures, and laboratory tastings, also with researches conducted and related to healthcare. **AIM:** To assess the knowledge, attitude and practices of Healthcare workers towards management of biomedical waste in the hospital. **RESULTS:** 194 participants who consented were included in the study. Study comprising 112 nursing staff, 35 Laboratory Technicians and 47 housekeeping staff. Most of the health workers belongs to 30-40 years age group (45.88%). 60.82% participants were female workers. 34.54% participants were having experience between 6-10 years. 28.57% nursing staff, 17.14% Laboratory Technician and 6.38% Housekeeping staff had excellent knowledge regarding biomedical waste management. **CONCLUSION:** Most of the responses were between good to average categories so improvement of awareness regarding biomedical waste management and handling should be focused with particularly more attention on housekeeping staff. This can be achieved by regular training and awareness programs.

KEYWORDS: - Biomedical waste, Healthcare workers, laboratory, Awareness

INTRODUCTION:-

Biomedical waste as the name suggest is the waste generated as a result of various activities and processes in Medical and Healthcare field. It is the outcome majorly because of patient care, treatment, surgical procedures, and laboratory tastings, also with researches conducted and related to healthcare.

According to Bio-Medical Waste Management Rules 2016, Biomedical waste is defined as "Bio-medical waste" means any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals or research activities pertaining thereto or in the production or testing of biological or in health camps, including the categories mentioned in Schedule I appended to these rules.[1]

The categorization of biomedical waste is indicated in schedule I for proper segregation for safe disposal of the waste. The amount of biomedical waste production ranges from 1-2 kg/bed/day in developing countries which is as high as 4.5 kg/bed/day in developed countries[2] that reflects the biomedical waste load generated around healthcare facilities.

Most part of the waste generated in healthcare are no risk or general waste produced on daily routine but the infectious and hazardous waste generated may possess potential high risk to patients, visitors, healthcare workers and waste handlers. According to WHO, around 85% of hospital waste is non-hazardous, 10% infective and remaining 5% non-infective but hazardous.[3] It create variety of health risk to the persons dealing with the waste.

Potential risk of injury and infection to the healthcare workers along with other individuals involved in handling or exposed to infectious biomedical waste is high if not handled properly. Lack of awareness along with improper knowledge about generation, segregation and disposal put them at higher risk. Adequate knowledge about health hazards of BMW, right attitude towards handling of BMW and practice of safety measures can ensure safe disposal of these wastes. In developing countries, biomedical wastes have not received sufficient attention; hence BMW management is still a challenge to the hospitals.[4]

It was expected that with tremendous advancement in global health care facilities adequate attention will be given to the disposal and management of biomedical wastes however the ground reality suggests that often the healthcare facility themselves have posed a huge health risk due to poor waste management by professionals and have become a huge threat to environment.[5] so this study directed to assess the knowledge, attitude and practices of Healthcare workers towards management of biomedical waste in the hospital.

MATERIAL AND METHOD:-

This cross sectional analytical study was conducted in Shalinitai Meghe Hospital and Research centre attached to Datta Meghe Medical College. After obtaining prior permission from Institutional Ethical Committee, the study was started and completed on period from January to

February 2021. The study population consists of the nursing staff, laboratory technicians and housekeeping staff working in the hospital who were the personnel exposed to and handled biomedical waste on daily basis. The predesigned questionnaire was prepared based on literature of Biomedical waste and Biomedical waste management Rules 2016 containing Knowledge, Attitude and Practice components regarding awareness about Biomedical waste, Biomedical Waste Management Rule 2016, Categories of Biomedical waste, generation, segregation, collection, labeling, transport, disposal and hazards of Biomedical Waste, level of Awareness and safe handling of waste. Prior informed consent was taken from the participants before filling the questionnaire sheet. Those participants who volunteered themselves for the study were given the proforma and time to fill with supervision. Final score was converted to percentages and labeled as Excellent (75-100%), good (50-75%), Average (25-50%) and poor (0-25%). Total 194 participants who completed questionnaire were used in the study for analysis comprising 112 nursing staff, 35 Laboratory Technicians and 47 housekeeping staff.

STATISTCAL ANALYSIS:-

The data was tabulated in Microsoft MS-Excel datasheet and analysis was done using SPSS 20 version of statistical software. Descriptive statistics like percentages, mean, standard Deviation were calculated for data analysis and chi-square test were used to test the significance (<0.5) between variables of different groups.

RESULTS:-

Table 1:- Demographic Characteristics of Participants

Demographic Variables	Frequency	Percentage
Age (In Years)		
20-30	43	22.16%
30-40	89	45.88%
40-50	35	18.04%
>50	27	13.92%
Gender		
Male	76	39.18%
Female	118	60.82%
Position		
Staff Nurse	112	57.73%
Laboratory Technician	35	18.04%
Housekeeping Staff	47	24.23%
Years of Experience		
<5 Years	51	26.29%
6-10 Years	67	34.54%
11-15 Years	47	24.22%
>15 Years	29	14.95%

Table 2:- Knowledge, Attitude and Practices regarding Bio-medical waste management among Health Care Personnel

Health Care Personnel	Excellent	Good/ Average	Poor	p value
KNOWLEDGE				
Staff Nurse	32(28.57%)	57(50.89%)	23(20.54%)	SN:LT=0.020
Laboratory Technician	06(17.14%)	15(42.86%)	14(40.00%)	LT:HS=0.0511
Housekeeping Staff	03(6.38%)	15(31.92%)	29(61.70%)	SN:HS= 0.00001
ATTITUDE				
Staff Nurse	41(36.61%)	58(51.78%)	13(11.61%)	SN:LT=0.0004
Laboratory Technician	04(11.43%)	16(45.71%)	15(42.86%)	LT:HS=0.41
Housekeeping Staff	08(17.02%)	23(48.94%)	16(34.04%)	SN:HS= 0.0008
PRACTICES				
Staff Nurse	26(23.21%)	49(43.75%)	37(33.04%)	SN:LT=0.96
Laboratory Technician	05(14.29%)	13(37.14%)	17(48.57%)	LT:HS=0.32
Housekeeping Staff	04(8.51%)	15(31.92%)	28(59.57%)	SN:HS= 0.001

RESULTS:-

194 participants who consented were included in the study and the datasheets were collected from them to analyse for the results. Study comprising 112 nursing staff, 35 Laboratory Technicians and 47 housekeeping staff from whom the sociodemographic data and knowledge, attitude and practice proforma was collected. Most of the health workers belongs to 30-40 years age group (45.88%) followed by 20-30 years age (22.16%). 60.82% participants were female workers and rest 39.18% were male participants. 34.54% participants were having experience between 6-10 years whereas 24.22% were had 11-15 years experience. 14.95% participants had experience more than 15 years.

When compared about knowledge component related to biomedical waste management among nursing staff, Laboratory Technicians and housekeeping staff, it was found that nursing staff had higher score for knowledge than other staff categories. 28.57% nursing staff had excellent knowledge about biomedical waste management whereas 50.89% belongs to good to average category. Laboratory Technician also shows excellent knowledge of waste management by 17.14% staff. 42.86% shows good to average score. Only few (6.38%) Housekeeping staff had excellent knowledge whereas 31.92% shows good to average knowledge about the biomedical waste management. Data was compared between these three categories shows statistical significant relationship between Staff Nurse and Laboratory Technician (p=0.02) and highly significant (p=0.00001) between Staff Nurse and Housekeeping Staff.

Attitude toward biomedical waste was accessed in this study found highest score for nursing staff with 36.61% staff had Excellent attitude towards biomedical waste management whereas 11.43% Laboratory technician and 17.02% Housekeeping Staff had excellent attitude. Good to average score scored by Nursing staff, Laboratory Technician and Housekeeping staff was 51.78%, 45.71% and 48.94% respectively. Only 11.61% nursing staff found poor attitude towards waste management. When data was compared between the categories, statistically highly significant relation were found between Staff Nurse and Laboratory Technician (p=0.0004) and staff Nurse and Housekeeping Staff (p=0.0008).

Practices regarding Bio-medical waste management among Health Care Personnel were also accessed in this study. Data about the waste management practices carried by these different categories shows 23.21% Excellent and 43.75% good to average practices regarding waste by nursing staff. Laboratory Technician shows 14.29% Excellent and 37.14% good to average practices. For housekeeping staff 59.57% had poor waste management practices, only 8.51% had excellent and 31.92% good to average biomedical waste management practices in this study. When data compared for statistical significance, nursing and Housekeeping staff shows statistically highly significant relationship with p value 0.001.

In all Knowledge, Attitude and Practices regarding Bio-medical waste management among Health Care Personnel shows higher score for nursing staff in all categories compared to Laboratory technicians and Housekeeping staff. This reflects their good knowledge and handling of biomedical waste in hospital.

DISCUSSION:-

Biomedical waste collection, storage and disposal in appropriate manner have become a significant concern for both medical and general community. Inadequate and inappropriate handling of healthcare waste along with poor infection control has led to increasing incidence of hospital acquired infections in health-care providers.[6]

In recent times there has been a significant increase in public awareness and concern regarding biomedical waste disposal but various studies have shown that level of awareness in India is still poor.[7]

This cross sectional analytical study was planned and conducted in healthcare personnels i.e. nursing staff, laboratory Technicians and Housekeeping staff to access the Knowledge, attitude and Practices carried out by them in relation to the biomedical waste management.

The study shows higher score for the nursing staff for all categories than the other staff. The knowledge and practices score is higher for nurses followed by Laboratory Technicians. Housekeeping staff had lower score for Knowledge and practice component. Similarly when compared for attitude towards biomedical waste management, Nursing staff and Housekeeping staff had good attitude compared to laboratory technicians. Sekar M[4] in their study shows similar trends of scores for these healthcare workers.

Gupta V[8] I their study found 62% housekeeping staff with poor knowledge and 62% with poor practice score, statistics similar to our study with 61.70% staff with poor knowledge and 59.57%

with poor practice score. Anand P[9] in their study of Knowledge, attitude and practice of biomedical waste management among health care personnel in a teaching institution in Haryana also shows that nursing and laboratory technician had better knowledge than Housekeeping staff. In contrast a study by Sekar M[4] and Padmasree D[10] shows better knowledge regarding biomedical waste in Laboratory Technician than Nursing and Housekeeping staff. The staff which also shows poor knowledge reflects need of regular training and awareness programs for them with special focus on housekeeping staff. Focused training, strict supervision, daily surveillance, inspections, involvement of hospital administrators and regular appraisals are essential ways to optimize the biomedical waste regulation in hospitals.

Shamnani G[11] in their study shows 93.75% high to medium score for Knowledge, 81.25 for attitude and 93.75% for practices of nursing staff compared to 79.46%, 89.39% and 66.96% score in our study. Attitude score of Laboratory technician was found 69.75% in their study is higher than our study which shows 57.14%.

Soyam GC[12] in their study 'KAP study of bio-medical waste management among health care workers in Delhi' shows similar trend like our study. They found knowledge of nursing staff about biomedical waste management excellent similar to our study, statistically significant attitude in nursing staff when compared to technicians and housekeeping staff which was also similar to this study which shows statistically highly significant results when nursing staff compared to Laboratory technicians and housekeeping staff (p value 0.0004 and 0.0008 respectively). Their study found that the nursing staff practiced BMW management better than the technical and housekeeping staff and difference was statistically significant. We shows similar results with statistically highly significant values between nursing staff and housekeeping staff (p=0.001). Similar results were also found in study of Lavanya KM[13] comparable to our study.

CONCLUSION:-

Assessing the study results shows that Nursing staff have better knowledge, attitude and practices of biomedical waste handling than the other comparative groups like Laboratory Technicians and Housekeeping staff. Study shows that most of the responses were between good to average categories. So improvement of awareness regarding biomedical waste management and handling should be focused with particularly more attention on housekeeping staff. This can be achieved by regular training and awareness programs along with administrative supervision and surveillance, inspections for biomedical waste regulations in hospitals. Strict practices with knowledge awareness of biomedical waste management, generation, segregation and proper disposal are need of hour to reduce the injuries and health hazard related to biomedical waste.

LIMITATIONS AND RECOMMENDATIONS:-

Present study is limited to small number of healthcare workers who consented to participate in the study voluntarily. As it is a also new college and single institute, a larger studies with inclusion of all healthcare workers are recommended including private hospitals and

multispecialty clinics to compare the trends and behaviour of healthcare workers toward biomedical waste management, safety measures and prevention and prompt reporting of health issues which may occurred as a result of it.

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