International Journal of Medical and Pharmaceutical Research
Website: https://ijmpr.in/| Print ISSN: 2958-3675 | Online ISSN: 2958-3683
NLM ID: 9918523075206676
Volume: 4 Issue:2 (Feb-Mar 2023); Page No: 19-23

Research Article

IJMPR

Perception And Practice Of Hospital Waste Management Among Medical And Nursing Personnel

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ABSTRACT

Introduction: Present study attempts to assess the knowledge, attitude, and practices regarding hospital waste management among PG residents, nurses, and students in selected hospitals of Indore district (M.P.).Biomedical waste management has recently emerged as an issue of major concern not only to hospitals, and nursing home authorities but also to the environment. The proper management of biomedical waste has become a worldwide humanitarian topic today. It is a well-established fact that there are many adverse and harmful environmental effects including human beings caused by the 'Hospital waste' generated during patient care.

Methodology: This study was a hospital-based cross-sectional study conducted among 150 Health care workers by simple random sampling. Pre-designed, semi-structured Observation checklist for Health care providers has been used to assess the knowledge, attitude, and practices regarding hospital waste management among PG residents, nurses, and students in selected hospitals of the Indore district. The collected data was analyzed using SPSS 21. **Results**- Most of the UG students and PG residents know about the color coding of BMW more than nurses. Most PG residents know that wastes in yellow bags are treated by incineration, unlike UG students and nurses. Most of the medical staff agreed that BMW reduces the incidence of hospital-acquired infection. Most of the PG residents and UG students agreed that the segregation of waste is necessary before waste disposal.

Conclusion- Based on our study, PG residents had more knowledge and a better attitude toward biomedical waste management guidelines as compared to nurses and UG students.

Key Words: *Attitude, BWM, Knowledge, Practice*

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INTRODUCTION

Biomedical waste management has recently emerged as an issue of major concern not only to hospitals, and nursing home authorities but also to the environment. The proper management of biomedical waste has become a worldwide humanitarian topic today. It is a well-established fact that there are many adverse and harmful effects on the environment, including human beings, caused by the 'Hospital waste' generated during patient care. According to Biomedical waste (Management and Handling) Rules, 1998 of India. The term "Biomedical waste" has been defined as "Any waste which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining to or in the production or testing of biologicals and includes categories mentioned in schedule I" [1]. Bio-Medical Waste (Management and Handling) Rule 1998, prescribed by the Ministry of Environment and Forests, Government of India, came into force on 28th July 1998 [2]. This rule applies to those who generate, collect, receive, store, dispose of, treat, or handle bio-medical waste in any manner. The Act is now superseded by Bio-Medical Waste Management Rules, 2016, which came into force on 28th March 2016 [3]. Table 2 shows the categories of biomedical waste, types of waste, and treatment and disposal options under Rule 2016.

World Health Organization states that 85% of hospital wastes are non-hazardous, whereas 10% are infections and 5% are non-infectious but they are included in hazardous waste [4]. About 15% to 35% of Hospital waste is regulated as infectious waste. This range is dependent on the total amount of waste generated [5]. Hospital waste is generated in India and the waste generation rate ranges from 0.5 to 2 kg/bed/day. Uttar Pradesh is the 4th highest in generating biomedical waste (43500 kg/day) after Karnataka, Maharashtra, and Tamil Nadu. In order to prevent harmful consequences to human health, and the community, proper medical waste management (MWM) is needed, which entails managing waste from its separation, through collection, separation, transport, and treatment, to its final disposal[6].However, the lack of appropriate waste management options for clinics can cause a variety of adverse impacts on the communities they serve such as infection transmission and soil and water contamination.

Objective: The aim of this study is to determine Knowledge, Attitude, and Practices regarding hospital waste management among residents, nurses, and students.

Methodology
Study site: This study was carried out in selected hospitals of the Indore district.
Study Design: This study was a hospital-based Cross-sectional Study
Duration of study: The study duration was from June 2021 to June 2022

Study Population: This study was carried out among the healthcare providers including PG residents, UG students, and Staff nurses, working in selected hospitals of the Indore district.PG residents, Undergraduate students, and Staff nurses, both males and Females who were aged 20 years and above, working in the health care facility with a minimum of 6 months of professional experience were included as study participants. Those participants who refused to give informed consent were excluded from the study.

Study tool: Apre-designed semi-structured Observation checklist for Health care providers were used to assess the knowledge, attitude, and practices regarding hospital waste management among PG residents, nurses, and students in a selected hospital in the Indore district.

Sample size: The sample size was calculated based on the prevalence of knowledge level among Health care Workers conducted by Dalui et al[7] which was 43.2 %, with an allowable error of 8%, the sample size was estimated to be 150.

Sampling method: The participants were selected through simple random sampling which included healthcare personnel working in different departments in hospitals. A total of 150 healthcare workers agreed to participate in the study which included 50 PG residents, 50 Undergraduate students, and 50 Nurses who were interviewed and observed for hospital waste management practices.

Data collection: After obtaining Institutional Ethical Committee Approval, participants were selected by inclusion and exclusion criteria. Informed consent was obtained from each of the study participants, the questionnaire was explained to them and the responses were filled out using the interview method.

DataAnalysis: The collected data were entered into Microsoft Office Excel and analyzed using Statistical Package for Social Sciences (SPSS) version 21. Relevant frequency distribution was calculated and tabulated. The quantitative variables were expressed in mean and standard deviation and the qualitative variables in frequency and percentage. The Chi-square test with a p-value of <0.05 was considered significant.

Results

Among 150 study participants, 50 were PG residents, 50 were UG students and another 50 were staff nurses. Most of the participants 72% were males and 28% were females. Nearly 70 % of PG residents and staff nurses had a minimum of 2 years of work experience in tertiary care facilities. Almost all the PG residents and UG students belonged to the Upper and upper-middle class of socio-economic status as per the modified BG Prasad scale and most of the staff nurses belonged to the lower middle class of socio-economic status. Table 1 shows the age distribution of the study population.

Table 1: Age Distribution of Study Population

Age (years)	Frequency	Percentage (100%)
18-22	96	64
22-26	32	21.3
>26	22	14.6
TOTAL	150	100

Analysis of data revealed that on all counts, PG residents and UG students have better knowledge than the staff nurse regarding hospital waste management. Knowledge regarding color coding and disposal of cytotoxic drugs was better among PG residents compared to UG students and nurses which is depicted in Table 2

Table 2: Knowledge regarding Hospital Waste Management(n=150)

S.NO	Questions	Respondents	Correct	Incorrect
1	Knowledge about color coding of bags in hospitals to dispose of waste sharp	Nurse	30 (60%)	20 (40%)
		Student	36 (72%)	14 (28%)
		Resident	40 (80%)	10 (20%)
2	Knowledge about color coding of bags to dispose of drug ampules	Nurse	36 (72%)	14 (28%)
		Student	36 (72%)	14 (28%)
		Resident	43 (85%)	07 (15%)
3	Knowledge about the treatment of BMW in yellow plastic bags	Nurse	35 (70%)	15 (30%)
		Student	35 (70%)	15 (30%)
		Resident	45 (90%)	05 (10%)
4	Knowledge about the best disposal of cytotoxic drugs	Nurse	30 (60%)	20 (40%)
		Student	37 (74%)	13 (26%)
		Resident	43 (85%)	07 (14%)

Table 3: Attitude Regarding Hospital Waste Management (n=150)

S.NO	Questions	Response	Resident	Nurse	Ugstudent
1	BMW increases the financial burden on hospital administration and is a waste of money	Strongly Agree	5 (10%)	2 (4%)	4 (8%)
		Agree	4 (8%)	5 (10%)	4 (8%)
		Don't know	1 (2%)	10 (10%)	8 (16%)
		Disagree	25 (50%)	10 (20%)	10 (20%)
		Strongly Disagree	15 (30%)	23 (46%)	24 (48%
2	BMW is the responsibility of the government and not my responsibility	Strongly Agree	2 (4%)	2 (4%)	3 (6%)
		Agree	5 (10%)	7 (14%)	5 (10%)
		Don't know	40 (80%)	36 (72%)	34 (68%)
		Disagree	3 (6%)	5 (10%)	8 (16%)
		Strongly Disagree	2 (4%)	2 (4%)	3 (6%)
3	BMW reduces the incidence of hospital-acquired infection	Strongly Agree	2 (4%)	2 (4%)	3 (6%)
		Agree	5 (10%)	7 (14%)	5 (10%)
		Don't know	40 (80%)	36 (72%)	34 (68%)
		Disagree	3 (6%)	5 (10%)	8 (16%)
		Strongly Disagree	2 (4%)	2 (4%)	3 (6%)
4	Segregation of waste is necessary before waste disposal	Strongly Agree	2 (4%)	2 (4%)	3 (6%)
		Agree	5 (10%)	7 (14%)	5 (10%)
		Don't know	40 (80%)	36 (72%)	34 (68%)
		Disagree	3 (6%)	5 (10%)	8 (16%)
		Strongly Disagree	2 (4%)	2 (4%)	3 (6%)
5	How frequently do you think training should be provided for healthy persons requiring knowledge of BMW	No need	2 (4%)	2 (4%)	3 (6%)
		Every month	5 (10%)	7 (14%)	5 (10%)
		Every 3-6 month	40 (80%)	36 (72%)	34 (68%)
		Every 1-2 years	3 (6%)	5 (10%)	8 (16%)

Regarding practices related to hospital waste management, most of the PG residents discard safely the used needles and follow hand washing protocol after handling hospital waste compared to the staff nurses and UG students. More than half of PG residents, UG students, and staff nurses never throw the general waste in bins for hospital waste management which is shown in Table 4

Table 4: Practice Regarding Hospital Waste Management (n=150)

S.NO	Questions	Response	Resident	Nurse	Ug student
1	How often do you safely discard all the needles you use?	Always	40 (80%)	39 (78%)	35 (70%)
		Often	6 (12%)	7 (14%)	9 (18%)
		Sometimes	3 (6%)	3 (6%)	4 (8%)
		Never	1 (2%)	1 (2%)	2 (4%)
2	Do you use a needle cutter before disposing of used needles?	Always	36 (72%)	40 (80%)	35 (70%)
		Often	9 (18%)	2 (4%)	8 (16%)
		Sometimes	4 (8%)	7 (14%)	6 (12%)
		Never	1 (2%)	1 (2%)	1 (2%)
3	How frequently do you throw off the general waste in bins for BMW	Always	1 (2%)	0	3 (6%)
		Often	2 (4%)	2 (4%)	7 (14%)
		Sometimes	4 (8%)	7 (14%)	6 (12%)
		Never	43 (86%)	41 (82%)	34 (68%)
4	Do you follow hand washing protocol after handling biomedical waste?	Always	40 (80%)	38 (76%)	33 (66%)
		Often	7 (14%)	9 (18%)	13 (26%)
		Sometimes	1 (2%)	2 (4%)	2 (4%)
		Never	2 (4%)	1 (2%)	2 (4%)

The Chi-square analysis revealed a statistically significant association between Knowledge (p=0.0386), Attitude (p=0.0032), and Practice (p=0.0464) scores and respondents indicating that PG residents have better knowledge and attitude towards Hospital waste management than the staff nurses and UG students shown in Table 5

Table 5: Distribution of Knowledge, Attitude, and Practice Scores Among the Respondents (n=150)

Respondents	Knowledge		Total	P-value
	Poor	Good		
	n (%)	n (%)		
Nurse	12 (24.0%)	38 (76.0%)	50 (100.0%)	0.0386
UG Students	20 (40.0%)	30 (60.0%)	50 (100.0%)	
PG Students	9 (18.0%)	41 (82.0%)	50 (100.0%)	
Respondents	**Attitude**		**Total**	**P-value**
	Negative	Positive		
	n (%)	n (%)		
Nurse	10 (20.0%)	40 (80.0%)	50 (100.0%)	
UG Students	21 (42.0%)	29 (58.0%)	50 (100.0%)	0.0032
PG Students	7 (14.0%)	43 (86.0%)	50 (100.0%)	
Respondents	**Practice**		**Total**	**P-value**
	Wrong	Correct		
	n (%)	n (%)		
Nurse	8 (16.0%)	42 (84.0%)	50 (100.0%)	
UG Students	18 (36.0%)	32 (64.0%)	50 (100.0%)	0.0464
PG Students	10 (20.0%)	40 (80.0%)	50 (100.0%)	

The chi-square test with p-value <0.05 is significant

Discussion

Our study's response rate is quite good compared to other studies [8]. Based on the present study most of the residents, nurses, and UG students were observed to be good in theoretical knowledge as well as practices which are in accordance with a similar study conducted by Sharma et al and Deori in 2020 to assess KAP regarding Biomedical waste management among healthcare personnel in Lucknow, India [9]. Most of the participants knew that segregation of waste must be done at the point of waste generation and this finding was similar to the finding of the study done by karmaker et al and Amin et al [10]. The study also revealed that most of the residents, nurses, and UG students believed that the training should be provided every 3-6 months which is similar to the interventional study done by Kulkarni [11] in 2012 on doctors in the district of Maharashtra which found that the score of participants improved significantly after one training session. Moreover, healthcare workers are the key personnel responsible for medical waste management from generation until their final disposal [12].According to the results, a high percentage of the respondents used color coding to identify and classify waste, indicating a high understanding of MWM [13]. Almost most of the participants in our study were well aware of color coding for waste segregation which is in contrast to the observations by Mathur V et al [15]. Thus, the present study concludes that regular training of Health workers regarding Hospital waste management is an essential public health measure to reduce health hazards due to Biomedical waste. However, in order to lower the risk of

environmental contamination, the risk of infection, or damage to healthcare workers and the general public, local authorities should develop a well-planned collection and transfer strategy for medical waste.

CONCLUSION

Based on our study PG Residents had more knowledge and a better attitude toward biomedical waste management guidelines as compared to nurses and UG students. KAP regarding biomedical waste management is still inadequate, so most of the PG residents, nurses, and students believed that training should be provided every 3-6 months for biomedical waste management through well-designed seminars, programs, and workshops.

Recommendations

1) Information, education, and communication posters should be pasted on walls in wards, clinics, and labs about protocols of biomedical waste management.
2) Regular monitoring should be done to assess whether the norms are being followed.
3) Orientation sessions should be conducted at regular intervals in order to increase the knowledge of healthcare personnel.
4) District and state-level committees should be established which should regularly check institutions whether biomedical waste management protocols are being followed.

Source of funding: There are no sources of funding
Conflict of Interest: No conflicts of interest

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