

Original Research Article

Knowledge awareness and attitude about biomedical waste management among dental care professionals

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ABSTRACT

Background: Health care workers are constantly associated with generation, segregation and disposal of biomedical wastes. Knowledge, attitude and awareness of BMW management among HCWs are the three determinants used to evaluate the effective functioning of BMW management system of the Institution. This study aims to detect the degree of Knowledge, attitude and awareness of BMW management among HCWs in a dental hospital.

Methods: This study included 90 HCWs from three groups (dentists, interns, and paramedical staffs), each group comprising of 30 individuals. They were instructed to tick their response in the questionnaire containing 22 questions and were graded as good, average and poor based on individual score.

Results: Order of decreasing knowledge and attitude seen among the three groups was dentists followed by interns and paramedical staff. Decreasing order of awareness was postgraduates, interns and laboratory technicians with same score, followed by nurses and sanitary staffs. In our study, 88%, 86.7% and 69.33% of participants had above average KAA values respectively.

Conclusions: Doctors and interns had better understanding of BMW management than other Paramedical staff members. Sanitary workers were highly ignorant regarding BMW management. So a continuing medical education program on BMW management should be conducted on yearly basis to train and update newly appointed as well as existing HCWs.

Keywords: Attitude, Biomedical waste, Knowledge, Awareness, Questionnaire

INTRODUCTION

Biomedical waste is a global concern. Health care is an integral part of our society with an endeavour to reduce health problems and to eliminate imminent jeopardy to people's health. In the process of health care delivery, waste is generated which includes sharps human tissues, body parts or infectious materials which requires a specific management prior to its disposal; biomedical waste is a social responsibility and legal necessity. The world health organisation (WHO) has defined health care waste as well as waste produced by health care

establishments, research facilities, and laboratories including waste originating from minor or scattered sources such as that produced in course of health care undertaken in home.^{1,2} The term "biomedical waste" means any waste generated during diagnosis treatment or immunisation of animals or humans or research activities pertaining there to in production or testing or biological or in health camps.³ American dental association and centre for disease control notified that medical waste disposal must be carried out in harmony guidelines.⁴ In India uniform guidelines for practice in the country have been laid down under the bio-medical management and handling rules 1998. The waste management programme

in hospitals are in accordance to these guidelines and aim to minimise cross infection, improve the general hygiene in hospitals and minimise environmental pollution through proper treatment and disposal of waste.⁵

Classification of waste

The WHO has given the classification for developing countries of non-hazardous hospital waste like; sharps, infectious waste, chemical and pharmaceutical waste and Other hazardous hospital waste.

METHODS

A cross sectional survey was conducted among Dental health care individuals in August 2021. The target population included all the healthcare workers including the dentists, house surgeons and paramedical staff in the dental institution of the city. Paramedical staff consists of nurses, technicians, pharmacist, lab attendants All the Participants who were willing, gave verbal consent and were included in the study, which resulted in a total of 90 participants. Participants were asked to respond to each item in the questionnaire by choosing the most appropriate alternative. Confidentiality and anonymity of the respondents were assured. The questionnaires were distributed by a single examiner and participants were immediately asked to fill up and return the questionnaire. The study assessed knowledge, attitudes and awareness of health-care providers towards waste management. The

questionnaire consisted of four parts comprising 22 questions and information collected through questionnaire included; general information on respondents including age, education, job designation, knowledge regarding waste management, attitude and awareness regarding waste management.

Table 1: Classification of waste.

Category-1	Human anatomical waste
Category-2	Animal waste
Category-3	Microbiology and bio technology waste
Category-4	Waste sharps
Category-5	Discarded medicine and cytotoxic drugs
Category-6	Soiled waste
Category-7	Solid waste
Category-8	Liquid waste
Category-9	Incineration ash
Category-10	Chemical waste

Statistical analysis

The data was compiled and tabulated in Microsoft excel spread sheet and was subjected to frequency distribution analysis using SPSS version 22.0 (SPSS Pvt. ltd Chicago, IL, USA). In normality test, the distribution is parametric, so we had done Pearson correlation and the values ranges from +1,0,-1.

Table 2: Colour coding of bags for segregation of bio medical waste.

Colour	Type of container	Category of waste	Waste treatment
Yellow	Plastic bag	1, 2, 3, 6	Incineration/ deep burial
Red	Plastic bag/disinfected container	3, 6, 7	Autoclaving/ microwaving/ chemical treatment
Blue/White	Plastic bag/puncture	4, 7	Autoclaving/ microwaving
Translucent	Proof container	-	Chemical treatment and destruction/shredding
Black	Plastic bag	5, 9, 10 (solid)	Land filling

RESULTS

A total of 90 HCWs were included in this study. Level of Knowledge, Attitude and Awareness regarding BMW management among the three groups were shown in (Table 3). Mean and standard deviation between the three determinants were shown in (Table 2).

DISCUSSION

Health care is one of the fastest growing sectors in India. Biomedical wastes are generated from all levels of health care facilities causes a serious threat to environment as well as people associated with it.⁶ The recent developments in healthcare units are precisely made for the prevention and protection of community health. The Government has formulated the bio-medical waste (handling and management) rules in 1998 (hereafter referred to as the bio-medical waste rules) in order to specify procedures that have to be followed in the management and disposal of waste.⁷ Segregation of

Biomedical waste at the point of generation not only reduces the health hazards among the health care workers and also reduces the financial burden to the Institution.⁶ A pivotal aim of our study is to give us a unique opportunity to provide information about a KAA related to hospital waste management which is lacking in our Present generation. BMW Management system of our Institution has been analyzed using three determinants, KAA. Study participants were from various groups (group I-dentists, group-II interns, group III-paramedical staff), belonging to our institution. The decreasing order of knowledge awareness and attitude seen among the three groups was dentists followed by Interns and Paramedical staffs (Table 1). Our study was according to the conducted by Mathur et al which stated that doctors had a better knowledge than paramedical staff.⁸

From the results it was evident clear that the knowledge about the collection and handling of biological waste is high among doctors and paramedical staff when compared with the interns.

Table 3: Percentage of KAA of BMW management among different groups.

HCWs group	Knowledge (K)			Attitude (A)			Awareness (A)		
	Good	Average	Poor	Good	Average	Poor	Good	Average	Poor
Group-I	62.5	25	12.5	95	5	0	66.6	33.3	0
Group-II	37.5	50	12.5	60	35	5	50	16.6	33.3
Group-III	25	37.5	62.5	20	45	35	16.6	16.6	66.6

Table 4: Mean and standard deviation of KAP among different groups.

HCWs Group	SCORE					
	Knowledge (K)		Attitude (A)		Awareness (A)	
	Mean	SD	Mean	SD	Mean	SD
Group-I	11.7	1.7	6.9	1.6	8.0	2.3
Group-II	9.4	1.4	7.1	1.7	7.9	2.1
Group-III	11.7	1.4	6.9	1.4	7.9	2.1
Total	10.9	1.5	6.9	1.5	7.9	2.1

This is in accordance to a study in India conducted by Mathew et al which stated that the doctors were observed to be sound in their theoretical knowledge when compared with the junior staff and paramedical staff.⁹ The author also stated that the attitude towards BMW for doctors is casual where paramedical staffs are and junior staff is meticulous and careful which is in accordance with our study which showed the similar kind of results. The awareness is also high among the doctors when compared with the junior staff and paramedical staff which is accordance of the study conducted by Sachan et al which stated that people with higher education, as doctors have better knowledge, practice and attitude of BMW management.¹⁰ Although nursing staff have relatively less knowledge about the BMW management rules, but a good percentage of this category has a positive attitude and follows the correct practicing habits.

Mean score for knowledge, attitude and awareness were 10.9, 6.9, 7.9 (Table 2). Overall mean values of KAA has been affected by lower scores of Paramedical staff in our study, which is in accordance with the study conducted by Sekhar et al.¹¹ In our study 88% of participants had Satisfactory knowledge which is similar with study conducted by Sharma et al.¹² Surprisingly only 98% of the study subjects were correctly able to identify the symbol for biohazard. And about 23% of the participants felt that proper waste management protocol is a financial burden. It was reassuring to note that in the present study about 95% of the participants were aware about biomedical waste generation and legislation. The findings from the present study revealed that despite being aware of the BMW management protocols, majority (60%) of participants did not know about the proper colour coding used for waste disposal. The reason for awareness of colour coding bins could be due to the changes in colour coding of bins in the year 2016 which emphasise the need of proper training and update is required. Pearson correlation was done among variables.

Among category knowledge variables which shown positive correlation are identification of biohazard symbol, awareness about hazards of biomedical waste, awareness of waste generation rules method of disposing needles universal precautions while handling the waste. disposal of pharmaceutical waste in colour coding bins has shown a negative correlation. Among category attitude most of our participants were in thought of biological waste management as extra financial burden and had shown negative correlation. Among the category awareness most of the individuals were aware about incineration and results had showed positive correlation. The results of the study also helped us in understanding that most of individuals had not taken proper training in biomedical waste management and results showed a negative correlation. They (90% of participants) also showed their willing in obtaining further formal training. This will address the need to progress from the concept of “waste management” to one of sustainable decision making regarding resource use, including methods of waste minimization at source and recycling.

CONCLUSION

The problem regarding BMW management does not only limit itself to India, lack of awareness, appropriate policy and laws, and willingness has been responsible for the improper management of medical waste all over the world. It is hereby required that awareness regarding BMW should be increased and BMW collection and segregation should be taught and implemented at an early level so as to bring about noticeable positive change. Based upon the observations of our study we recommend that: All the employees of various designations are required to be aware of proper collection, segregation, and transport to the final disposal point. A single training session is not sufficient for effective and complete practice of biomedical waste management. There is a need for intensive training programs at regular time interval to repeatedly train and re-train all the staff with special importance to the new comers and to periodically

acquaint them with updated BMW management. There is also a need for orientation programs for newcomers to understand the hospital function and the proper collection and transport of hospital waste.

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