Original Article

AWARENESS OF DENTAL AUXILLARIES IN BIOMEDICAL WASTE DISPOSAL: A SURVEY

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Abstract:
Background: Improper handling and disposal of medical waste is hazardous to waste handlers, health care workers, environment and also increases the risk of nosocomail infections. Objective: This study was planned to evaluate the practical calibration and awareness of dental auxillaries in disposal of hazardous biomedical waste generated during dental treatment into color coded disposing bags at a dental hospital. Material and Methods: The study comprises of 18 dental auxillaries who was asked to dispose the biological, non-biological and semibiological material according to their knowledge into the color coded dustbin bags. The study was planned and carried out three times (for each dental auxillary) at different days. As each respondent was asked to dispose the waste of each category three times, thus waste was disposed for 162 times. Waste generated per day was calculated of each category for one month. Results were expressed as a number and percentage of respondents for each question and were analyzed using the SPSS Version 17 software. Chi-square test was performed and the level of significance was set at $p < 0.05$. Results: The correct disposal of biological waste in red coded dustbin was n=31 (57%), non-biological waste in green coded dustbin was n=30 (54%), semi biological waste in yellow coded dustbin was n=27 (50%). Thus waste was correctly disposed 88 times (54%).The mean and standard deviation (SD) of waste generated for the month of June 2014 in the dental hospital was 1.22±0.5. Conclusion: Dental auxillaries should be motivated to attend training and CDE programmes concerning waste management so that they will be efficient to properly segregate, disinfect and dispose hospital waste in an eco-friendly way.
Keywords: Biomedical waste, Dental waste, Hospital waste.

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Introduction

The health care sectors in the course of curing health problems produce a huge amount of bio-medical waste which may be hazardous to all those who come in contact with this waste. Hazardous waste management is a concern for every health care organization.[1] It may include wastes like sharps, soiled waste, disposables, anatomical waste cultures, discarded medicines, chemical wastes etc.[2]

According to notification, 1998 of the Government of India it has been specified that Hospital Waste Management is part of hospital hygiene and maintenance activities. This involves management of a range of activities, which are mainly engineering functions, such as collection, transportation, operation/treatment of processing systems, and disposal of waste. However, initial segregation and storage activities are the direct responsibility of

nursing personnel who are engaged in the hospital. If the infectious component gets mixed with the general non-infectious waste, the entire mass becomes potentially infectious.[3] Dental offices generate a number of hazardous wastes that can be detrimental to the environment if not properly managed. This includes sharps, used disposable items, infectious wastes (blood-soaked cotton, gauze etc.), mercury containing waste (mercury, amalgam scrap), lead containing waste (lead foil packets, lead aprons) and chemical waste (such as spent film developers, fixers and disinfectants).[1] The purpose of this study was to evaluate the practical calibration and awareness of dental auxillaries in disposal of hazardous biomedical waste generated during dental treatment into color coded disposing bags at a dental hospital so that depending upon their attitude they can be motivated to attend training and CDE programmes concerning waste management so that they will be efficient to properly segregate, disinfect and dispose hospital waste in an eco-friendly way.

Material and Methods

The study comprises of 18 dental auxillariess working in a corporate dental hospital, Hyderabad and the study was planned in the month of June 2014. The ethical committee clearance was obtained from the concerned authority. The waste generated from the dental hospital was categorized into biological, non-biological and semibiological material. The verbal and informed consent was taken from the study group and participants were asked to fill performa regarding their qualification and experience in the field. Practical calibration test was carried out three times (for each dental auxillary) at different days in which each dental auxillaries was observed while disposing the waste into the color coded dustbin bags which were red, green and yellow. Each study participant was asked to dispose the biological, non-biological and semibiological material according to their knowledge into the color coded dustbin bags. As each respondent was asked to dispose the waste of each category three times, thus waste was disposed for 162 times. Waste generated per day was calculated of each category for one month. Results were expressed as a number and percentage of respondents for each question and were analyzed using the SPSS Version 17 software. Chi-square test was performed and the level of significance was set at $p < 0.05$.

Results

Among a total of 18 respondents, 33% (n=6) were males and the rest 67% (n=12) were females. About 6 were nurses, 6 were assistants and the remaining 6 were helpers. As each respondent was asked to dispose the waste of each category three times, thus waste was disposed for 162 times. The correct disposal of biological waste in red coded dustbin was n=31 (57%), non-biological waste in green coded dustbin was n=30 (54%), semi biological waste in yellow coded dustbin was n=27 (50%). Thus waste was correctly disposed 88 times (54%).

According to the employ category, assistants disposed waste correctly 31 (57%), helpers 25 (46%) and nurses 32 (59%) times out of 54 times (table 2 and graph 1). Evaluation of waste disposal on the basis of qualification (table 3) showed that dental auxillaries working as helpers with 5th standard qualification, disposed waste correctly 3 times (33%) out of 9 times; 7th standard qualification, disposed waste correctly 9 times (50%) out of 18 times; 9th standard qualification, disposed waste correctly 3 times (33%) out of 9 times; Nurses with BSc and GNM qualification, disposed waste correctly 16 times (59%) out of 27 times; whereas nursing intern working as assistants disposed waste correctly 6 times (67%) out of 9 times; assistants with occational course, disposed waste correctly 4 times (45%) and those who attended politechnical course disposed waste correctly 5 times (56%) out of 9 times and an assistant with

Table 1: Evaluation of dental waste disposal according to waste category

Waste Category	Color coded dustbins	FALSE	TRUE	Grand Total	Match%
Biological	Red	23	31	54	57%
Non-Biological	Green	24	30	54	56%
Semi-Biological	yellow	27	27	54	50%
Grand Total		74	88	162	

Table 2: Evaluation of correct disposal of dental waste by dental auxillaries

Match%				
Employee category	Biological	Non-Biological	Semi-Biological	Total n=54 (%) for each employee category
Assistants	56%	72%	44%	n=31 (57%)
Helpers	44%	39%	56%	n=25 (46%)
Nurse	72%	56%	50%	n=32(59%)

Table 3: Evaluation of dental waste disposal according to qualification of study group

Qualification	Biological			Non-Biological			Semi-Biological			Overall True %	Grand Total
	False	True	True %	False	True	True %	False	True	True %		
5th Std.	2	1	33%	3	0	0%	1	2	33%	33%	9
7th Std.	4	2	33%	3	3	50%	2	4	67%	50%	18
9th Std.	1	2	67%	1	2	67%	1	2	67%	33%	9
BSc Nursing	2	7	78%	5	4	44%	4	5	56%	59%	27
GNM	3	6	67%	3	6	67%	5	4	44%	59%	27
Intern	1	2	67%		3	100%	2	1	33%	67%	9
Occupational Course	2	1	33%	2	1	33%	1	2	67%	45%	9
Polytechnic	1	2	67%	1	2	67%	2	1	33%	56%	9
Senior Secondary	7	8	53%	6	9	60%	9	6	40%	51%	45

Graph 1: Percentage of correct disposal of dental waste by dental auxillaries

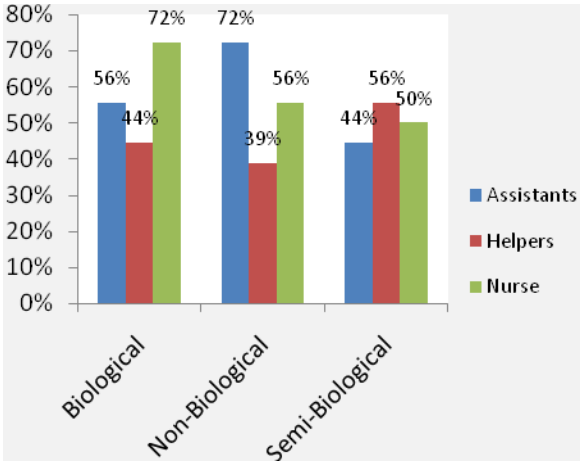

Table 4: Waste generated for the month of June 2014 in the Dental Hospital

Waste Category	Mean±S.D.	p-value
Biological	0.74 ±1.01	
Non biological	1.09±0.2	
Semi-biological	1.82±0.4	0.005
Total waste of month	1.22±0.5	

senior secondary education disposed waste correctly 23 times (51%) out of 45 times. Thus, differences existed in relation to educational qualification of respondents in knowledge and practice scores. The mean and standard deviation (SD) of waste generated for the month of June 2014 in the dental hospital was 1.22±0.5 which consists of biological waste 0.74 ±1.01, non biological 1.09±0.2 and semi-biological 1.82±0.4.

Discussion

Dental auxillariess form utmost important part of dental treatment as they hold and pass instruments, retract tissues and apply suction to lend a hand in better visualization of the operating field, sterilize instruments and equipments.[6] According to the Bio-medical waste rules 1998 of India, Bio – Medical Waste is defined as "Any solid, fluid or liquid waste, including its container and any intermediate product, which is generated during the diagnosis, treatment or immunization of human beings or animals, in research pertaining there to, or in the production or testing of biological and the animal waste from slaughter houses or any other like establishments."[4] The rules make it mandatory for the health care establishments to segregate, disinfect and dispose their waste in an eco-friendly way. Improper waste disposal can result in an increased risk of nosocomial infections in patients and can lead to change in microbial ecology.[5]

According to management and handling rules (1998, Schedule I) items sent to incinerator/burial, should be placed in yellow colour bags (e.g., human anatomical waste, microbiological waste, and soiled plastic waste), items that need to be sent for microwave/autoclave/chemical treatment should be placed in red coloured bags (e.g., infected plastic syringes, tubings, gloves, rubber dam sheets), the waste that need to be shredder after autoclaving/ microwaving/chemical treatment is to be placed in blue/white translucent bags/containers (e.g., sharp containers for needles and used files).[7] Green biomedical waste bag is for pharmaceutical waste which includes non-hazardous pharmaceutical waste and controlled drugs and disposal route involves denaturing if the drugs are controlled then incinerated.[8]

The results of the present study showed that the correct disposal of biological waste in red coded dustbin was 57%, non-biological waste in green coded dustbin was 54%, semi biological waste in yellow coded dustbin was 50%. Thus waste was correctly disposed 88 times (54%) out of 162 trials. Thus, the results of this study show that dental auxillaries are unaware of the proper protocol of disposal of hazardous waste. According to us, this is the unique study in which practical calibration test had been carried out where as the studies available in the literature are mostly cross sectional surveys. The emphasis should be laid down on attending workshops, training and CDE programmes concerning handling, segregation, disinfection, storage, transportation and final disposal of biomedical waste in any establishment.[9] Sanjeev R et al carried out a cross sectional survey in which only 16.3% of the dental healthcare personnel agreed that they had received training in biomedical waste management.[1] Arora R et al carried a cross sectional study and revealed that attending training or CDE programme about waste management practices has significant influence on knowledge of respondents about waste management guidelines, on application of colour coding practice for disposal of waste and on disposal of amalgam.[7] Due to increased prevalence of diseases like AIDS and Hepatitis B in health care workers and other personnel working in health care institutes, the proper waste management is of utmost important.[10]

Conclusion

Thus, the segregation, collection, transport as well as final disposal of various types of

waste and effective training and supervision of various categories of personnel involved in complete waste management system is of utmost important..

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