

Original Article

Evaluating Awareness Regarding Disposal of Biomedical Waste among Paramedicals

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ABSTRACT:

Objectives- To assess the knowledge & awareness about various aspects of biomedical waste disposal among paramedicals. **Materials and method** – A cross-sectional questionnaire based study was conducted to assess the knowledge, awareness and attitude towards BMW among paramedicals of a hospital in Lucknow. A total of 50 questionnaires were distributed among paramedicals and results were collected and analysed statistically using SPSS software version 17.0. **Results-** Survey was conducted on 50 paramedicals with predetermined questionnaire asked about BMW management in a hospital in Lucknow and the results showed that the 53% awareness were there about the BMW management. **Conclusion-** The result of present study showed that there was moderate knowledge and awareness about BMW among paramedicals in a hospital in Lucknow hence proper training programme about biomedical waste management should be conducted among paramedicals routinely.

Key words: Biomedical waste, waste management.

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INTRODUCTION:

Biomedical waste includes any waste which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biologicals.¹ The gazette notification of Government of India, 1998, implies that Hospital Waste Management is a part of hospital cleanliness and maintenance activities. This includes a range of activities like engineering functions such as collection, transportation, operation of treatment of processing systems and disposal of wastes. The waste generated in the process of health care activities carries a higher potential for infection and injury than any other form of waste. Around 75 – 90% of the biomedical waste is non-hazardous while the remaining 10-25% is hazardous. This percentage of waste poses the greatest health hazard to the living organisms of the environment.²

Annually about 0.33 million tons of hospital waste is generated in India alone. 0.5 to 2.0 kg per bed per day is the waste generation rate. The disposal of biomedical waste should strictly adhere to Biomedical waste management and handling rule 1998.³

Inadequate and inappropriate knowledge of handling of health care waste may have serious health consequences and a significant impact on the environment as well.⁴ Paramedical workers have no proper training in hazardous waste management. Awareness regarding safe disposal of Biomedical waste amongst them is very important as they are at greatest risk of infections. Considering this, the present study was undertaken to assess the awareness regarding biomedical waste amongst paramedical workers of a hospital in Lucknow.

AIM AND OBJECTIVE:

To assess the knowledge & awareness about various aspects of biomedical waste disposal among paramedicals.

MATERIALS AND METHODS:

An observational cross sectional study was conducted amongst the paramedical workers of hospitals in Lucknow. A total of 50 participants formed the study sample. 50 Paramedicals were taken. Males (24) and females (26) aged between 35 -40 years were included. Institution Ethical Committee (IEC) gave the approval for the study. Informed consents of all participants were

obtained after explaining the purpose of the study. The data regarding awareness was collected through a pretested, structured questionnaire. The questionnaire included variables like BMW disposal site, BMW regulations, colour coding, segregations of BMW and training in waste disposal. The investigator himself handed over the questionnaire to the participants after explaining the purpose and collected them once it were filled. Limited time period were given to fill the form (30 minutes)

A response rate of 100% was obtained. The data obtained was transferred to spread sheets and further analysed.

QUESTIONNAIRE FORM

Q.1 WHAT DO YOU UNDERSTAND BY BIOMEDICAL WASTE?

- a. HOUSEHOLD WASTE
- b. WASTE DISPOSED BY HOSPITAL/CLINIC
- c. DON'T KNOW

Q.2 BIOMEDICAL WASTE SHOULD BE DISPOSED IN-

- a. DUST BIN
- b. HANDOVER TO BMW AGENCY
- c. DON'T KNOW

Q.3 IS THERE ANY INSTRUCTIONS FOR BMW MANAGEMENT BY GOVERNMENT-

- a. YES
- b. NO
- c. DON'T KNOW

Q.4 SHARP NEEDLES SHOULD BE DISPOSED IN-

- a. RED BIN
- b. BLUE BIN
- c. DON'T KNOW

Q.5 WHAT SHOULD BE DISPOSED IN BLACK BIN?

- a. UNUSED MEDICINES
- b. CANCER MEDICINES
- c. BOTH a. And b.
- d. NONE OF THE ABOVE

Q.6 WHICH COLOR IS NOT PART OF THE BIOMEDICAL WASTE DISPOSAL

- a. YELLOW AND RED
- b. RED AND ORANGE
- c. PINK AND ORANGE
- d. BLUE AND RED

Q.7 I.V. BOTTLE SHOULD BE DISPOSED IN

- a. YELLOW BIN
- b. RED BIN
- c. BLUE BIN
- d. BLACK BIN

Q.8 HAVE YOU EVER TRAINED FOR BMW MANAGEMENT

- a. YES
- b. NO

Q.9 DO YOU BREAK THE SYRINGE NEEDLE BEFORE DISPOSAL

- a. YES
- b. NO

Q.10 GLOVES SHOULD BE DISPOSED IN-

- a. RED BIN
- b. BLACK BIN
- c. YELLOW BIN
- d. DON'T KNOW

Q.11 HAVE YOU BEEN IMMUNIZED BY HEPATITIS-B?

- a. YES
- b. NO

RESULTS:

The present study evaluates disposal of biomedical waste by paramedicals. Total 50 paramedicals age between 35-40 yrs (mean ± SE: 37.86 ± 1.90 yrs, median=38 yrs) either sex [female=26 (52%) and male=24 (48%)] were recruited. Total 11 questions related to disposal of biomedical waste were asked to each paramedicals. Each questions had four options (a, b, c and d) with one correct answer. The objective of the study was to know the awareness of paramedical staff for disposal of biomedical waste.

The distribution of disposal of biomedical waste questions and response to each question by paramedicals is summarised in Table 1. Of total questions, paramedicals have good awareness/knowledge (i.e. correct response) about Q1, Q2, Q3, Q7, Q9 and Q11 with highest on Q9 (96%) (Table 1 and Fig. 1). In contrast, the paramedical have poor awareness about Q4, Q5, Q6, Q8 and Q10 with highest on Q5 (82%).

Comparing the frequency (%) distribution of correct and incorrect response of each questions, χ^2 test showed significantly (p<0.01 or p<0.001) different and higher frequency of correct response to Q1, Q2, Q3, Q7, Q9 and Q11 by paramedicals as compared to incorrect response (Table 1). In contrast, paramedicals showed significantly (p<0.001) different and higher frequency of incorrect response to Q4, Q5, Q6 and Q10 as compared to correct response (Table 1). However, regarding Q8, the frequency of correct (44%) and incorrect (56%) response were found statistically similar (p>0.05) though the frequency of incorrect response was 12% higher than correct response (Table 1).

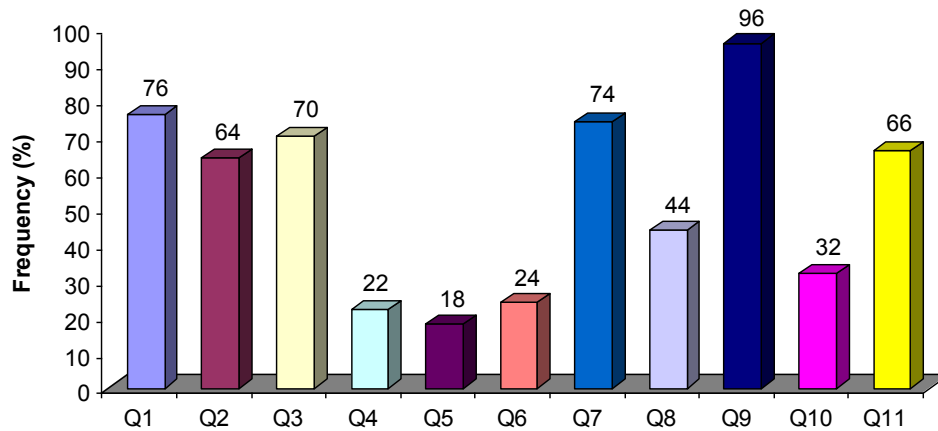
Overall, of total 550 answers, paramedicals response 293 correct and 257 incorrect accounting overall 53% awareness (Table 1 and Fig. 2). Further, the χ^2 test showed just significantly different and higher (6%) overall correct response than overall incorrect response (53% vs. 47%, $\chi^2=4.71$, p=0.030) (Table 1).

Table 1: Distribution of correct and incorrect response by paramedicals on disposal of biomedical waste

Questions	Options [#]				Correct response (n) (%)	Incorrect response (n) (%)	χ^2 value	p value
	a	B	c	D				
Q1.	7	38	5	0	38 (76)	12 (24)	27.04	<0.001
Q2.	15	32	3	0	32 (64)	18 (36)	7.84	0.005
Q3.	35	2	13	0	35 (70)	15 (30)	16.00	<0.001
Q4.	11	27	12	0	11 (22)	39 (78)	31.36	<0.001
Q5.	8	4	29	9	9 (18)	41 (82)	40.96	<0.001
Q6.	32	12	3	3	12 (24)	38 (76)	27.04	<0.001
Q7.	3	6	37	4	37 (74)	13 (26)	23.04	<0.001
Q8.	22	28	0	0	22 (44)	28 (56)	1.44	0.230
Q9.	48	2	0	0	48 (96)	2 (4)	84.64	<0.001
Q10.	16	7	25	2	16 (32)	34 (68)	12.96	<0.001
Q11.	33	17	0	0	33 (66)	17 (34)	10.24	0.001
Total	230	175	126	19	293 (53)	257 (47)	4.71	0.030

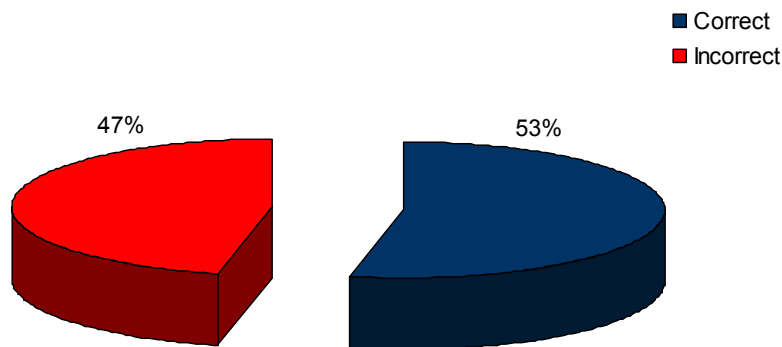
[#]The correct response to each questions are marked with bold font in blue colour

Correct response to disposal of biomedical waste by paramedicals



GRAPH/BAR CHART DEPICTING THE PERCENTAGE OF RESPONDENTS WITH CORRECT LEVEL OF AWARENESS

Overall response to disposal of biomedical waste by paramedicals



PIE CHART SHOWING THE DISTRIBUTION OF OVERALL OF PARAMEDICALS ON DISPOSAL OF BIOMEDICAL WASTE

DISCUSSION:

A cross sectional questionnaire study was conducted among the paramedical to evaluate awareness regarding biomedical waste management. The study was conducted on 50 paramedical using a 11-items predesigned questionnaire.

Different kinds of infectious medicinal waste, specifically the sharp waste, are responsible for increasing number of deaths as reported in the past literature. The WHO has assessed that in the 2000, transfusions mainly with contaminated syringes resulted in 21 million cases of Hepatitis B, 2 million cases of Hepatitis C and 260000 HIV positive cases.⁶

Biomedical waste management is a major concern not only concerning hospitals or nursing homes, but also environmental and law enforcing agencies and the public. The present study showed that 76% of the study

population know what exactly is biomedical waste even though it was only 24% of the paramedics who were unaware about BMW, it is still alarming as then as the person who handle hospital waste. This is in accordance with study of Ajmal et al who reported 65% of paramedics had good awareness regarding biomedical waste management.⁶

Question 4,5,6,7 evaluated regarding the colour coding segregation of biomedical waste. a majority of the participants were unaware of the colour coding i.e. 78.6%. Most of the variables reported significant readings at p<0.001 excepting for training obtained for BMW. As reported earlier in the result , only 22(44%) i.e. Lesser than half of the study participant had received any formal training for BMW management. This finding is contradictory to the study done by Mathur et al⁷ who reported that all staff must be trained for BMW practice.

With regard to increasing prevalence of infectious disease, universal precaution and proper biomedical waste management holds the solution to this issue. Incorporating biomedical waste management and practices into the curriculum and strict adherence to the laws must be called for. 53% of paramedicals response had satisfactory knowledge score regarding waste management in this study. Finding was similar to the study conducted by Khan MJ et al⁸, who reported 64% awareness score.

Mohd Shafee et al⁹ who reported 53.2% of paramedicals had adequate knowledge. 64% of them knew regarding the existence of BMW agency for proper disposal of waste in this study. This is in concordance to the study of Khan MJ et al, who also found 60% of nurses with the same opinion. 70% of the paramedicals in the study were aware of the BMW rule of the government which is similar to the study conducted by Phani madhari et al wherein authors reported 67.8% of study population had knowledge regarding BMW rules and regulations.

Studies reported even lesser percentage of awareness among study subjects. Shourya Kanti Das et al¹⁰ reported nearly 30.8% of the subjects knew about BMW rules, whereas Chudasana¹¹ observed 51.4%.

The problem of biomedical waste disposal in the hospitals and health care set ups has become an increasing concern which has prompted hospital administration to seek better and innovative ways of scientific, safe and cost effective management of the waste. The need for proper biomedical waste management system is of first importance and is an essential component of quality assurance in hospitals.

Suggestions:

Biomedical waste management must be the concern of all health care personnel, from a doctor to a supporting staff. It is worth sparing few minutes of time to make hospital environment clean, healthy and infection free. The need of the hour calls for comprehensive training programs on handling, segregating, transportation, storage of waste in colour coded bins till they are finally disposed and treated. Proper immunization of all personnel in contact with biomedical waste management must be done. Housekeeping staff must wear protective equipments like gloves, face masks and gown. Using color coding bags appropriately is more important because mixing of waste creates a big problem for staff and also management for safe disposal.

CONCLUSION:

In spite of regulations existing on biomedical waste existing, it is not executed completely. Absence of legitimate waste management, limited awareness about the risks of such waste from biomedical waste, limited budget and lack of human resources as well as poor control of the waste disposal are the major issues linked with biomedical waste. Besides lack of knowledge, hospital staff usually disregards the standard techniques of waste management.

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