

An Assessment of Knowledge, Attitude and Practices (KAP) of Bio-Medical Waste Management During Covid-19 Among Health Care Workers In A Tertiary Care Hospital of Bihar

Md. Sariful Haque¹, Kamran Fazal², Prem Kumar Singh³, Ahmad Nadeem Aslami^{4*}, Rakesh Kumar⁵

¹Tutor, Department of PSM, JLNMC, Bhagalpur, Bihar, India

²Assistant Professor, Department of PSM, JLNMC, Bhagalpur, Bihar, India

³Professor, Department of PSM, JLNMC, Bhagalpur, Bihar, India

⁴Assistant Professor, Department of PSM, JLNMC, Bhagalpur, Bihar, India

⁵Tutor, Department of PSM, JLNMC, Bhagalpur, Bihar, India

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Abstract

Background: India is facing a lot of health care problems. With the increasing health care facilities, there is a growing concern of hazards of biomedical waste. Corona virus 19 (COVID 19) pandemic has added to this burden. Since the health care workers are at the centre of biomedical waste handling, their knowledge of adequate disposal of biomedical waste is of prime importance. Keeping this in mind, we conducted a study to assess the knowledge, attitude and practice(KAP) of Bio-medical waste management during COVID-19 among health care workers in a tertiary care hospital of Bihar. **Methods:** This was a hospital-based descriptive, observational study conducted in JLNMC, Bhagalpur in the month of November and December, 2020. Written consent was taken and pre-defined questionnaire was prepared. Convenience sampling was done to select the participants representing almost all departments of the hospital. **Results:** 120 participants took part in the questionnaire based study. The study showed that nearly two third participants had adequate knowledge about biomedical waste management. Most of them had positive attitude and they were practicing proper methods of waste disposal too. But, there were gaps in the knowledge, attitude and practice. **Conclusion:** There is an urgent need to strictly implement biomedical rules in all the health facilities. There should be regular orientation programmes for all health workers.

Keywords: Biomedical waste, KAP, Health care workers, COVID 19.

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Introduction

According to Bio-Medical Waste (Management and Handling) Rules, 1998 of India, "Biomedical waste" or BMW means 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 biological.[1] As per WHO, around 85% of the hospital waste is non-hazardous and rest are hazardous. Out of hazardous category, 10% are infective while 5% are non-infective. It is a major challenge for tertiary care hospitals to manage this infectious waste. If improperly managed, they can be a potential risk factor for the health care workers (HCW), the community and environment.[2] In many developing countries like India, proper management of the BMW is still an exception and not a rule. In spite of increased awareness among health care providers about such hazards and also having its proper management techniques repeatedly taught to them, still the level of awareness about BMW in India has been found to be unsatisfactory.[3] HCW who handle waste generated in hospitals are at high risk of getting fatal diseases like hepatitis B and C and HIV by contaminated needles and other waste sharps. Hence, knowledge regarding various hazards of needle-stick injury is necessary among health care providers. They should also

have positive attitude towards waste management and practice the same.[4] The emergence of COVID-19 has led to the increase of medical waste where a desperate need for proper waste management has emerged. A substantial surge in the waste volume has been documented arising from the enhanced use of personal protective equipment (PPEs) including – face masks, hand gloves, rubber boots and white gowns, hand sanitizers and other medically used gears such as – syringes, test kits, plastic containers, bandages, tissues, etc. [5]

Knowledge, attitude, and practice (KAP) surveys are very popular in the health science studies. They do not require a large budget, usually address an easily accessible population, and appear simple and straightforward, conducted even by students and other researchers who may not have an adequate theoretical and practical grounding.[6] In India, even after 23 years of making biomedical waste management rules there are poor results. This indicates need to assess KAP of HCW's, so that we can do some interventions. However research in this area is very limited in this part of Bihar. Therefore the present study aimed to assess the knowledge, attitude and practice(KAP) of Bio-medical waste management during COVID-19 among health care workers in a tertiary care hospital of Bihar

Material & Methods

A cross sectional study was conducted in Jawaharlal Nehru Medical College & Hospital, Bhagalpur. It is a tertiary care medical college & hospital in Bihar with a capacity of nearly 1500 HCWs including doctors, nursing staff, lab technicians and cleaning staff. The period

*Correspondence

Dr Ahmad Nadeem Aslami

Assistant Professor, Department of PSM, JLNMC, Bhagalpur, Bihar, India.

E-mail: ahmadnadeemaslami@gmail.com

of study was from November to December, 2020. The approval from the Institutional Ethical and Research Committee was obtained before conducting the study. The Study sample comprised of 120 health care personnel of the Medical College Hospital including 30 from medical staff (doctors), 30 from nursing staff (nurses), 30 laboratory technicians and 30 from cleaning staff. Those health care personals who were freely willing to take part in the study were included while those who were either not willing to take part in the study and/or those who had worked in the hospital for less than a year were excluded from the study. Written consent was taken. Convenience sampling was done to select the participants representing almost all departments of the hospital.

A structured, pre-designed, pretested, questionnaire was prepared. The data was collected from the study participants by 'interview method'. The questionnaire comprised of many questions to assess the level of knowledge, attitude and practices respectively of the study participants. All the questions were prepared from standard textbooks and from BWM training manuals. Questions were devised such that knowledge questions assessed the awareness, amount of

information or understanding about BWM, attitude questions assessed thoughts and feelings of the participants towards BWM and practice questions assessed actions or actual behaviour towards BWM in wards etc.

The data were collected in forms and later underwent scrutiny for any logical inconsistencies, skip patterns, and missing values. The data was then coded and entered into Microsoft Excel. Then data was transported to SPSS version 16.0 available freely. Descriptive and inferential statistics were applied for data analysis. The percentages and their 95% confidence intervals are being presented. Z test of proportion was calculated with p value. A p value of <0.05 was taken as significant and <0.001 was taken as highly significant.

Results

Out of 120 study participants, most were in the age group 20-30 years (55.8%). 51.6% participants were males and 48.4% females. Regarding their working experience, majority were having experience of 1-5 years (62.5%) while 37.5% has experience more than 5 years (Table 1).

Table 1: Demographic profile of study participants

Characteristics	Frequency n (%)
Age group (In Years)	
20-30	67 (55.8%)
30-40	46 (38.4%)
>40	7 (5.8%)
Sex	
Male	62 (51.6%)
Female	58 (48.4%)
Work Experience (In Years)	
1-5	75 (62.5%)
>5	45 (37.5%)

With regard to knowledge on BMW management, 18% (n=22) denied that they have any kind of knowledge regarding biomedical waste generation (Figure 1). Most of the remaining participants gave the correct definition of biomedical waste (70.1%). 80 out of 120 (66.7%) knew about the agency to regulate waste generated at health care facility. Only one fourth of the participants knew about

biomedical waste (management and handling) rules, 1998 formulated by government of India. Only 38 out of 120 participants (31.7%) had adequate knowledge of storage of biomedical waste before disposal. But most of them (71.7%) have knowledge of transport and adequate disposal of biomedical waste (Table 2).

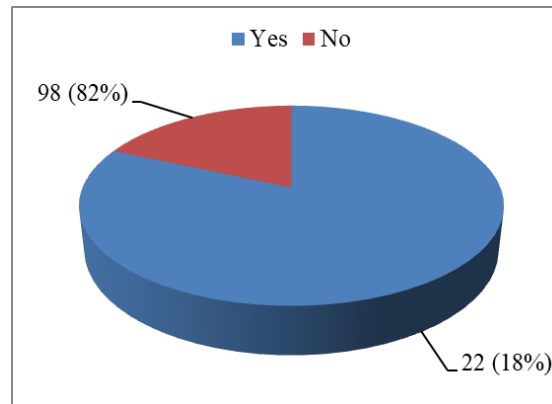


Fig 1: Knowledge about BMW generation

Table 2: Knowledge about BMW generation and Legislature (n=120)

Knowledge of BMW	Given Correct answers	Confidence interval (95%)	p value
	N (%)		
Definition of BMW	85 (70.1%)	61.8 - 78.2%	0.0344*
Agency to regulate waste generated at health care facility	80 (66.7%)	58.27 - 75.13	0.0289*
Formulation of BMW rules in India	31 (25.8%)	17.9 - 33.6%	0.0813
Storage of BMW	38 (31.7%)	23.4 - 40.1%	0.0635
Disposal of BMW	86 (71.7%)	63.6 - 79.7%	0.0125*

*Significant

Fig. 2 represents knowledge of colour-coding segregation of BMW. 112 out of 120 (93.3%) said that they have full knowledge of segregation. However only 73 out of 120 (60.8%) participants were

able to correctly answer the questions on colour coding. 38 out of 120 (31.7%) did not have correct knowledge while 9 out of 120 (7.5%) did not answer (Fig. 3).

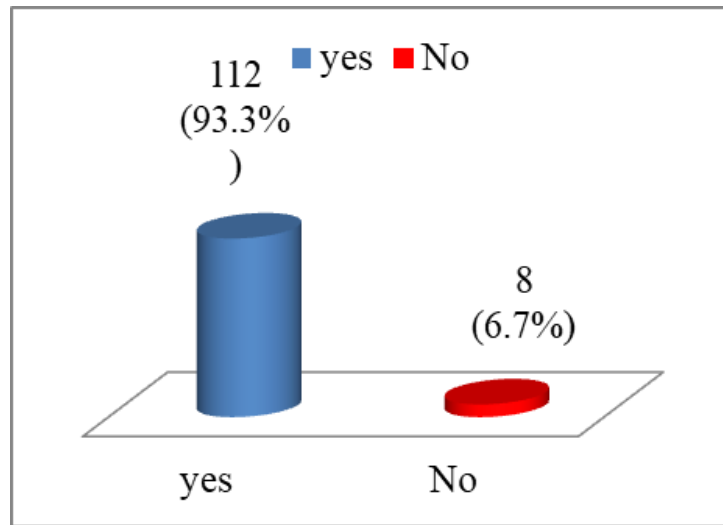


Fig. 2: Knowledge of colour-coding segregation of BMW (n=120)

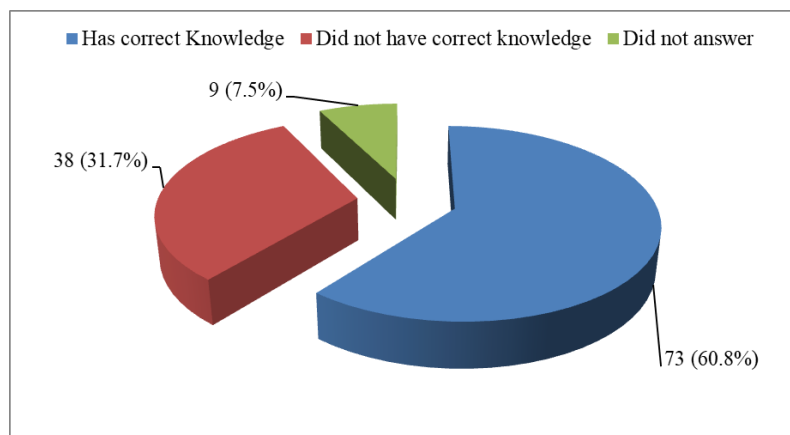


Fig. 3: Knowledge on BMW containers

Regarding the attitude of the participants, most had positive attitude. Over 69% think that waste management is a critical health issue.

95.8% thought that regular training should be given to upgrade existing knowledge on waste management (Table 3).

Table 3: Attitude on BMW management (n=120)

Attitude on BMW management	Have positive attitude n (%)	Confidence interval (95%)	p value
Self management of Health care waste is not an issue	83 disagreed (69.1%)	60.8 - 77.4%	0.1153
Waste management is a team work	95 agreed (79.2%)	60.8 - 77.4%	0.1153
Safe management of health care waste is an extra burden on work	84 disagreed (70%)	61.8 - 78.2%	0.1238
Regular training should be given to upgrade existing knowledge	115 agreed (95.8%)	92.2 - 99.4%	0.5810

*Significant

Lastly, regarding practice of BMW norms, most of the participants follow fairly good practice. A significant number of participants dispose BMW in a specified colour coded container and discard used

needles in needle destroyer. However, there is an inadequacy in filling the incident report of any contact with BMW and only 62 out of 120 (51.7%) follow this practice (Table 4).

Table 4: Practice of BMW (n=120)

Practice of BMW	Good practice n (%)	Confidence interval (95%)	p value
Disposal of BMW in specified colour coded containers	81 practice (67.5%)	59.1 - 75.9%	<0.0001
Discard used needles in needle destroyer	103 practice (85.8%)	79.5 - 92.0	<0.0001
To fill an incident report	62 practice (51.7%)	42.7 - 60.64	<0.0001

Correlations among knowledge, attitudes and practices were calculated in respect to BMW management. Correlation analysis was

conducted based on Pearson methods. A positive but non-significant correlation (p=0.078) were found between knowledge & attitude

($r=0.0342$), knowledge & practice ($r=0.231$) and practice & attitude ($r=0.412$). The low correlation recorded in this study can be attributed to the moderate/ low score levels for the three aspects of the respondents i.e. knowledge, attitude and practice.

Discussion

The study was based on a pre-formulated and pre-tested questionnaire. Similar protocol was adopted in various studies.[7-10] Our study showed that 82% of the study participants heard about BMW, which was not a very high value as compared to a study done by Basu et al in West Bengal. In a study done by Shafee et al among paramedical workers at Andhra Pradesh, this rate was only 53.2%. The difference of knowledge may be due to the difference of literacy status between doctors, nurses and paramedical workers.[8,11] Various studies had shown the knowledge among HCW with respect to colour coding range from 20% to 95%. [8-14]

Most of the HCW feel that BMW is a critical health issue, it is a team work and it is not an extra burden on their work. Similar results were there in previous studies. [12, 15, 16] Regarding safe and rational practice in BMW, most of the participants follow good practice. Majority of them practice proper disposal of BMW according to colour coding and dispose of used needles in needle destroyer as is also seen in various studies. [15,17,11] Malini et al found in their study that 50% of the HCWs did not get training in BMW management.[15]

However, disappointing results were there in filling the incident report for any inadvertent event due to BMW. Most of them were rather not aware of a formal system of reporting. Comparing this with previous studies the results is very much implying the need of better reporting system of various adverse events in the health facility so that adequate steps can be taken.[18]

Conclusion

This study revealed a very interesting fact about HCWs. Although the attitude is fairly good towards the management of BMW, the knowledge and practice of participants is comparatively poor. This emphasizes the role of various training programmes of management of BMW to be conducted regularly among HCWs.

Recommendations

It is recommended that there should be regular organizations of such programmes and the HCWs should compulsorily attend such programmes. There should be strict implementation of waste management rules and defaulters should be warned and if possible punished by law. All staffs should be made aware of the formal system of reporting of hazard due to BMW. It should be made compulsory that one should report such injury to concerned authorities so that appropriate measures can be taken.

Limitations

This study did not collect direct data on BMW management practices and relied on self-report. So, this may result in over-reporting of correct responses by participants. Actual KAP on BMW management might be low, but due to social desirability bias, it came out to be high. Another limitation of the study was that since it was based on semi-structured questionnaire, every aspect of KAP could not be assessed. Also, not much details on problems faced by HCWs and their suggestions could be obtained.

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