Knowledge and Practice of Health Care Personnel on Medical Waste Management at Primary Care Level of Northern Bangladesh

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Abstract

Introduction: Medical waste can be generated in hospitals, clinics and places where diagnosis and treatment are conducted. Proper management of medical waste is a great concerned issue due to association with public health risks as well as with environment. Effective management regarding medical waste is not only a legal necessity but also a social responsibility. The objective of the study was to assess the knowledge and practice of health care personnel regarding medical waste management at primary health care level of Northern Bangladesh.

Method: This descriptive type of a cross-sectional study was conducted from 250 health care personnel that included Doctors, Nursing staff, Laboratory technologists and Cleaners of eight Upazila level health care facilities of Northern Bangladesh. They were selected by Multistage sampling technique. Data were collected from the respondents through a self-administered and interviewer administered semi-structured questionnaire after taking informed consent. Finally Data analysis was done with Statistical Package for Social Science (SPSS) version 26. A p-value <0.05 was considered statistically significant.

Results: A large number of respondents (40.0%) were in the age group of more than 40 years with mean age of the respondents beings 40.06. Majority of the respondents (55.60%) were male and among the respondents majority were (26.40%) from Nurses and Laboratory technologists. Adequate knowledge regarding medical waste management found maximum (77.3%) for Nurses and minimum (18.8%) for Cleaners. Health care personnel whose service length were more than 10 years had maximum (64.2%) adequate knowledge. Relationship between training received regarding medical waste management and knowledge level showed statistically significant ($p< 0.05$). Health care personnel from Government health care facilities found maximum (59.9%) adequate knowledge level. Good practice for medical waste management found majority for Nurses (17.60%).

Conclusion: This study represented the actual scenario of knowledge and practice of health care personnel regarding medical waste management at primary health care level. So, it will help to make an effective plan for the concerning authority regarding proper medical waste management.

[M Abdur Rahim Medical College Journal, 2023 Jul; 16 (2):128-134]
[Former Dinajpur Medical College Journal]

Keywords: Medical Waste, Waste management

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Introduction

The waste generated during the process of diagnosis, treatment, operation, immunization or in health research activities are termed as medical waste.[1] Generation of excessive medical waste is an ongoing problem for many countries and become a major public health problem. As the number of health care facilities are increasing day by day, so proper medical waste management is important. Major part of medical waste (75-90%) generated by the health care personnel is non-risk or general and remaining (10-25%) of medical waste is considered as hazardous the potential for creating a variety of health problems.[2] Hospital acquired infections have been estimated at 10% of all fatal or life threatening diseases in the South-East Asia region and have been identified as one of the indicators for the management of medical waste.[3] Alarmingly the World Health Organization (WHO) reported a 50% re-use of syringes and needles in India that are meant for single use.[4]Health care is a high risk sector because of the high incidence of work related injuries and diseases due to inadequate or lack of compliance with standard waste management protocols and safety measures against occupational hazards.[5] The medical waste are simply mixed with the municipal wastes in the collecting bins at the road side and some are buried without any precautions or are burned in the open.[6] There has been no published study about knowledge and practice of health care personnel regarding medical waste management at primary health care level at Bangladesh. Therefore, it was necessary to conduct this study with the objectives to assess the knowledge and to observe the practice of health care personnel regarding medical waste management at primary health care level of Northern Bangladesh.

Methods

This was a cross-sectional type of descriptive study. In this, data were gathered from 250 health care personnel of study population by interviewing them once at one period of health care facilities of eight Upazila of Rangpur and Rajshahi divisions from 1 January 2021 to 31 December 2021. Health care personnel included Doctors, Nursing staffs, Laboratory technologists and Cleaners of Pirganj, Ranisankail, Birganj, Kaharole, Puthia, Tanore, Lalpur and BagatiparaUpazila level health facilities of Rangpur and Rajshahi divisions. Multistage sampling technique was applied to include required number of sample. First of al, total four districts were selected from Rajshahi and Rangpur division of Northern Bangladesh by Simple Random Sampling (SRS), and then from the selected districts total eight (8) Upazilas were taken by Simple Random Sampling (SRS), where two Upazilas were from each district. Semi-structured questionnaires were used to collect data from the participants. Self-administered questionnaire were used for Doctors and Nursing staffs and interviewer administered questionnaire were used for Laboratory technologists and Cleaners. In this study total 12 questions were used to assess the level of knowledge. Each question regarding knowledge were 3 options and analysis of each option were scored as “0”, “1”and “2” point respectively and then knowledge level was categorized into adequate and inadequate knowledge. Here, 60% and above score was considered “adequate knowledge” and below 60% was considered “inadequate knowledge”. Practice includes proper application or use of standard protocol regarding medical waste management. Here, it includes the uses of adequate number of colored bins and keeping the medical waste in right colored bins with using personal protective equipment and proper transport, storage and final disposal. In this study to assess the practice level total 30 questions were used. Each question had 2 options. For “Yes” the

score counted "1" and for "No" score counted "0". Finally practice score 60% or above considered "Good practice" and score below 60% considered "Poor practice".

Results

Out of 250 respondents 17.6% were in up to 30 years old followed by 40.4% of 30-40 years. Among the total respondents 42.0% were in age group of more than 40 years (Table I).

Table I: Distribution of respondents by their age (n= 250)

Age (Year)	Frequency	Percent
< 30	44	17.6
30-40	101	40.4
>40	105	42.0
Total	250	100.0

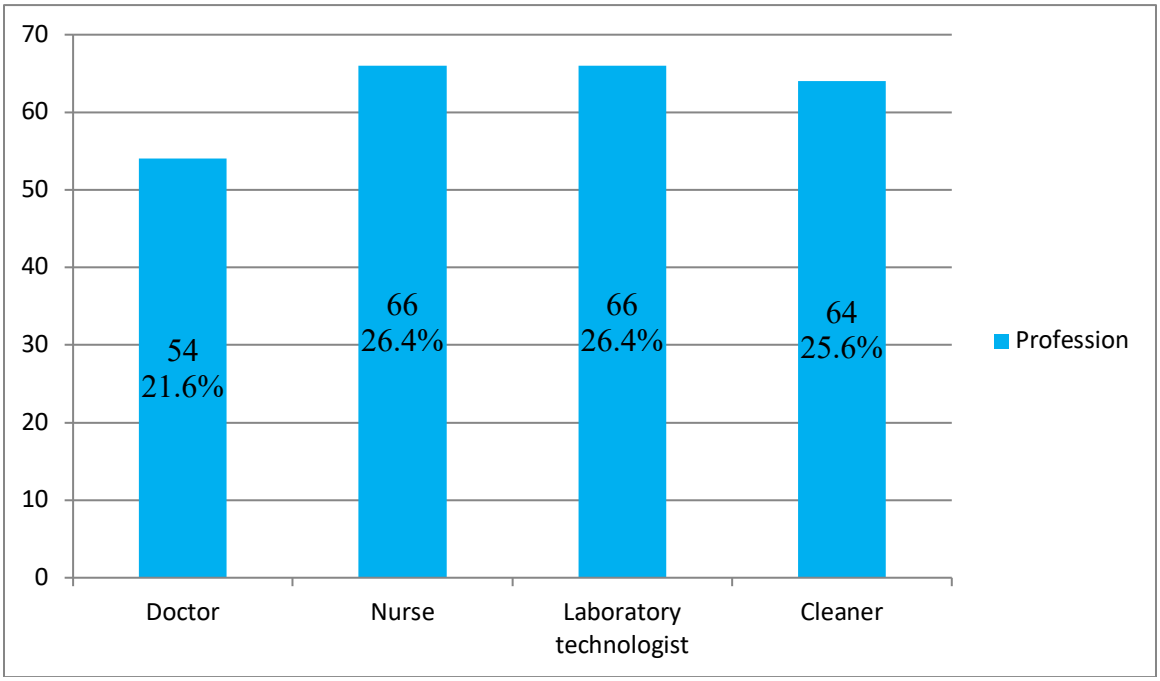

Figure 1. Distribution of respondents by their profession (n=250)

Figure 1 showed that maximum (26.40%) of the respondents were Nurses and Laboratory technologists. Doctors and cleaners contributed 21.60% and 25.60% respectively.

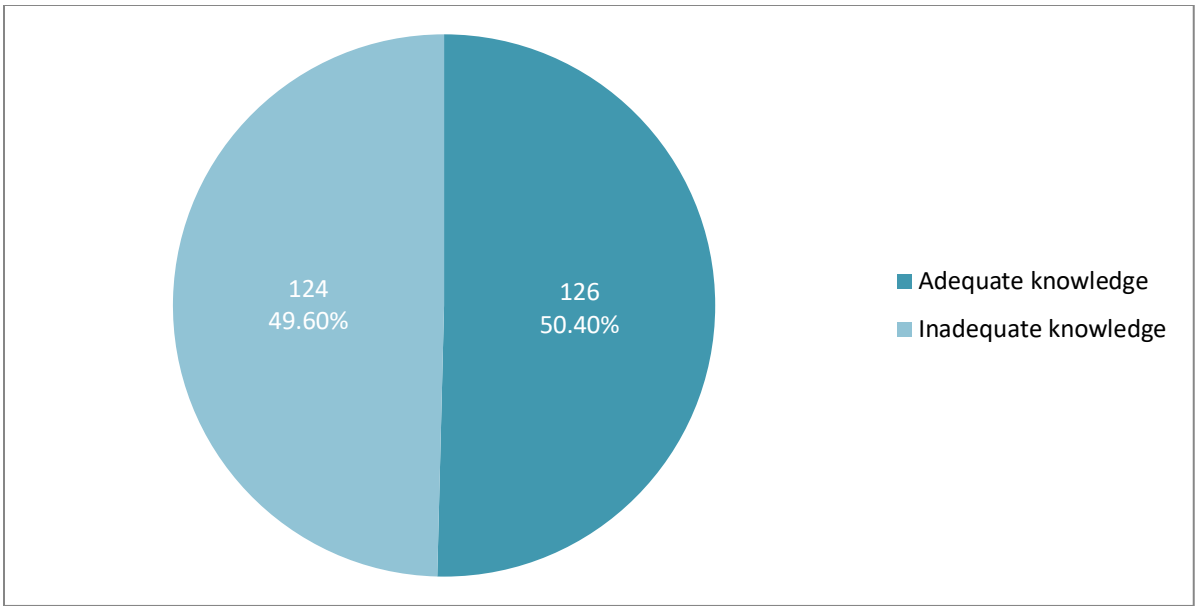

Figure 2. Knowledge of the health care personnel regarding medical waste management (n= 250)

Figure 2 showed that out of 250 respondents 50.40% had adequate knowledge regarding medical waste management and 49.60% of respondents had inadequate knowledge regarding medical waste management.

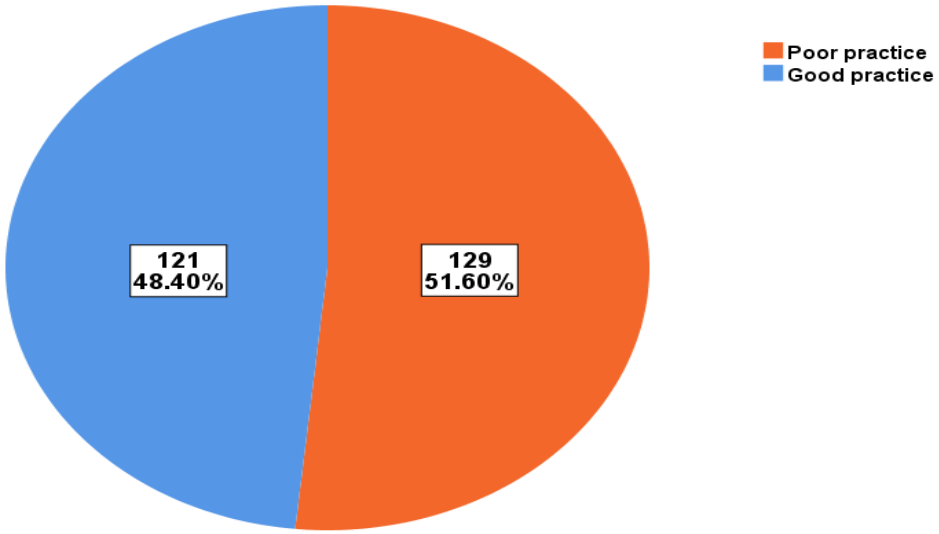

Figure 3. Practice status of the respondents regarding medical waste management (n= 250**)**

Figure-3showed that among the total 250 respondents, 48.40% had good practice and 51.60% had poor practice regarding medical waste management.

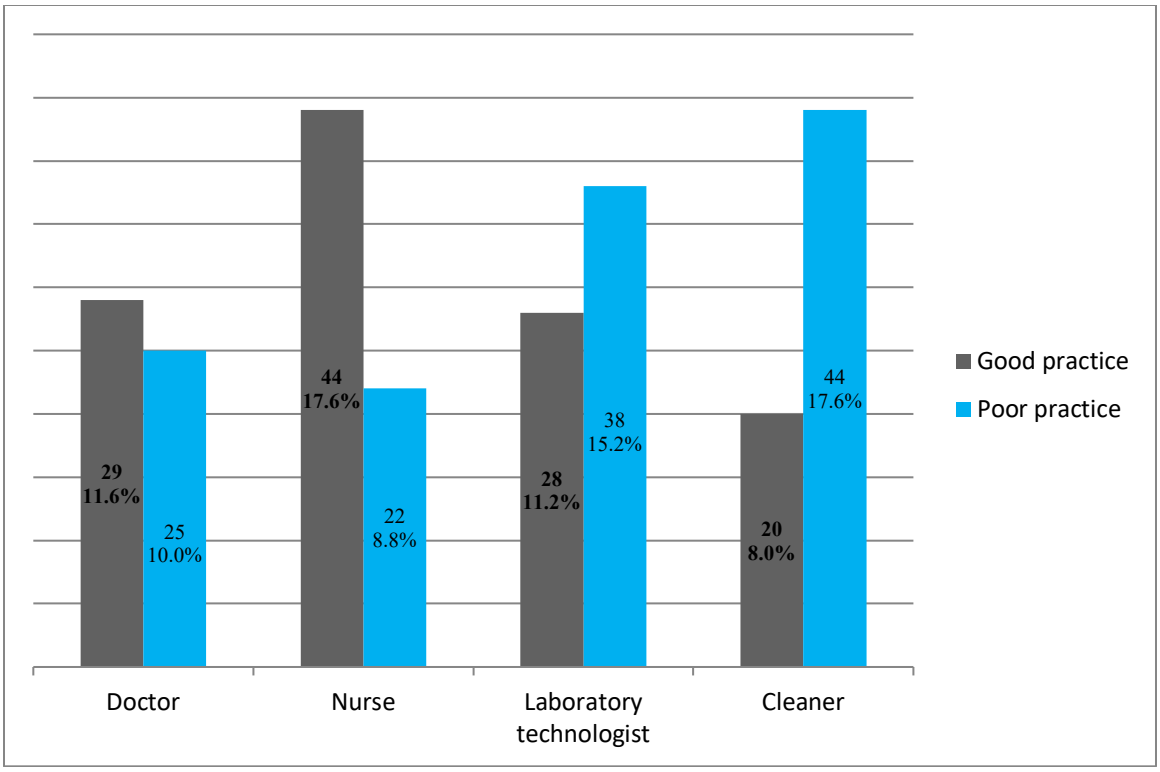

Figure 4. Practice status of individual professional level (n=250)

Figure 4 showed that maximum 17.60% of Nurses had good practice regarding medical waste management. Among the total respondents 11.60% of Doctor and 11.20% of Laboratory technologist had good practice. Maximum 17.60% of cleaners had poor practice regarding medical waste management. Less than one-sixth (15.20%) of the Laboratory technologists had poor practice.

Table II: Relationship between Knowledge and Practice (n= 250)

Knowledge	Practice		Total
	Good practice Frequency (%)	Poor practice Frequency (%)	
Adequate knowledge	95 (75.4)	31 (24.6)	126 (100.0)
Inadequate knowledge	26 (21.0)	98 (79.0)	124 (100.0)
Total	121 (48.4)	129 (51.6)	250 (100.0)

X^2=74.134, df= 1, $p < 0.05$

Table II represented among the total 250 respondents who had adequate knowledge three-fourth (75.4%) had good practice and one-fourth (24.6%) had poor practice. So, the relationship between knowledge and practice of the respondents regarding medical waste management was statistically significant ($p < 0.05$).

Table III: Relationship between profession and knowledge of the respondents (n=250)

Profession	Knowledge		Total
	Adequate knowledge Frequency (%)	Inadequate knowledge Frequency (%)	
Doctor	37 (68.5)	17 (31.5)	54 (100.0)
Nurse	51 (77.3)	15 (22.7)	66 (100.0)
Laboratory technologist	26 (39.4)	40 (60.6)	66 (100.0)
Cleaner	12 (18.8)	52 (81.3)	64 (100.0)
Total	126 (50.4)	124 (49.6)	250 (100.0)

$p < 0.05$

Table III represented among the total Doctors majority (68.5%) had adequate knowledge and out of total 250 respondents maximum (77.3%) adequate knowledge counted from Nurses. So, the relationship between knowledge and profession of the respondents regarding medical waste management was statistically significant ($p < 0.05$).

Table IV: Relationship between knowledge and training received regarding medical waste management (n=250)

Status of training received	Knowledge		Total
	Adequate knowledge Frequency (%)	Inadequate knowledge Frequency (%)	
Yes	52 (96.3)	2 (3.7)	54 (100.0)
No	74 (37.8)	122 (62.2)	196 (100.0)
Total	126 (50.4)	124 (49.6)	250 (100.0)

$p < 0.05$

Table IV represented among the total respondents who had received training, maximum (96.3%)had adequate knowledge and who had no training, maximum (62.2%) had inadequate knowledge. So, the relationship between knowledge and training received status of the respondents regarding medical waste management was statistically significant ($p < 0.05$).

Discussion

This cross-sectional type of descriptive study was conducted to assess the knowledge and practice of the health care personnel regarding medical waste management at primary health care facilities of Rajshahi and Rangpur division of Bangladesh. To assess the level of knowledge regarding medical waste management total 12 questions were used and to observe the practice of the health care personnel regarding medical waste management total 30 questions were used.

Maximum respondents were from Nurses and Laboratory technologist (26.40%) and minimum respondents were from Doctors (21.60%). Service duration of maximum respondents (42.4%) were more than 10 years. Among the total 250 respondents maximum, 78.40% were not trained regarding medical waste management and those got training all had passed more than 2 years of their received training. These findings were similar with a study in Nigeria, where only 40.7% of respondents had got training.[5]Among 250 respondents 50.40% had adequate knowledge and 49.60% had inadequate knowledge regarding medical waste management. This is consistent with the findings of a study in Istanbul where hospital staffs similarly demonstrated inadequate knowledge regarding medical waste management.[7]Among the total

250 respondents 48.40% had good practice and rest 51.60% had poor practice regarding medical waste management. Among the total respondents with adequate knowledge majority 75.4% had good practice and 79.0% of respondents with inadequate knowledge had poor practice. This finding corroborates with the findings of similar study conducted in Uganda, where the most health workers had satisfactory practices and the practices of health workers on Health care waste management were satisfactory which relates to appreciable knowledge as there was significant relation between practice and knowledge level.[8]

Out of the total 250 respondents majority of Nurses (77.3%) had adequate knowledge and majority of cleaner (81.3%) had inadequate knowledge. This findings was similar with the study conducted in Delhi, which showed nursing staff had significantly more knowledge than others health care staff.[9]Findings of a study reported that knowledge on healthcare waste type and diseases transmission through contact of infectious waste had an influence on practice of healthcare waste management,[10]similarly this study claimed that those who had adequate knowledge on medical waste type were more likely to practice healthcare waste management than those who had inadequate knowledge on medical waste type. Majority 17.60% of Nurses had good practice regarding medical waste management and this findings were similar with findings of a study conducted in Al-Mansoura University Hospital, Egypt.[11]

Conclusion

The overall findings of this study indicated that the majority of health care personnel did not apply the recommended medical waste management practices. Moreover, the current medical waste management practice in studied health facilities were managed improperly and can pose a risk for human health and the environment.

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