



# Assessment of awareness and behavior regarding Biomedical Waste among Health Care Personnel in public hospitals at (Sabratha City)

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## Abstract

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Biomedical waste management focuses on reducing the volume of waste generated within hospitals, and classified waste into various steps, reduction, segregation storage, transportations and treatment and disposal, to prevent infection. Lack of knowledge about bio-Medical waste management has a significant influence on the environment, and health care workers. This paper aimed to assess the level of awareness and behavior for employees in Sabratha hospitals towards dealing with bio-medical waste and ways to dispose it. The results were collected by means of a questionnaire distributed to 205 participants were randomly selected from the hospital staff. The data was analyzed by using the statistical analysis system (SPSS-22). The results showed that the medical-staff have low level of awareness and behavior toward medical waste management, both awareness and behavior rated (48%). The study indicate that the relationship between awareness and behavior was Positive, that mean increasing the level of awareness helps to improving behavioral level of hospital workers.

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**Keywords:** Bio medical waste management, behavior, awareness, hospital workers, Sabratha city.

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## Introduction

In order to reduce health problems and eliminate the imminent danger to people's health, health care is an essential component of our society [1].

As a result, it is the responsibility of hospitals and health centers to protect public health, whether directly by caring for them within the facilities or

indirectly by ensuring that the environment is free of bio-medical waste [2]. Biomedical waste is defined as any waste produced during the diagnosis, treatment, or vaccination of humans or animals, as well as any activities or biological tests [3,4]. Segregation, treatment and disposal of biomedical waste play a vital role in hospital infection control programme. Objectives of Biomedical waste (BMW) management mainly involves preventing transmission of disease from patient to patient, from patient to health workers, to prevent injury to the health care workers, while handling biomedical waste, to prevent general exposure to the harmful effects of the cytotoxic and chemical biomedical waste generated in hospital [5]. waste management and treatment is necessitates prior to its final disposal. About 80% of the waste generated by health-care activities is considered general waste, while the other 20% is classified as hazardous waste, which could be radioactive or contagious [6]. In fact, all medical waste is classified as hazardous waste because it poses a serious and direct threat to public health [7].The health sector has seen a significant improvement waste

treatment that generated by health institutions after receiving the highly level of attention more than other types of waste, especially in developing countries [8]. Waste must be treated and managed before being disposed to final landfills; severity of the threat increases the spread of infectious diseases such as the human immunodeficiency virus (HIV) and hepatitis (B.C) [9]. In Southeast Asia, medical waste spread infections deadly diseases at a rate of 10%, and were identified as one of the hazardous waste management. [10]. Medical waste management is lacking in some countries, and there is a need of understanding about the dangers of medical waste. There is also an insufficient supply of medical and weak control over its disposal waste [11]. Although there is a rising global understanding of the risks and suitable management approaches among health care providers. In addition, India's level of awareness was determined to be inadequate. [12].Therefore, the current study came to evaluate the awareness and behavior of medical-staff towards dealing with biomedical waste in public hospitals at the city, Sabratha.

### **Research methods and materials:**

This study was a cross-sectional survey based on a questionnaire that was conducted for (205) health care personal were sampled for this study. Questionnaire were randomly distributed among doctors, nurses, technicians and other medical workers in hospitals. The questionnaire divided into three parts. Section (A) comprised of demographic profile of respondents. Section (B) is designed to measure the level of awareness of workers towards dealing with medical waste. Fifteen questions design answers from three registered ones. (Yes, No, I do not know). Section

(C) consists of (12) questions covering environmental aspects designed to determine the level of workers' behavior and their dealing with medical and biomedical waste produced inside Sabratha Teaching Hospital. The questionnaire was distributed in the period from 7June to 15July of the year 2021. The respondents were asked to return the questionnaire immediately and data were analyzed by Statistical Package for the Social Sciences (SPSS-22) and express the results as a number and percentages of respondents for each question.

### **Results and Desiccation:**

The purpose of achieving these study objectives, a total of 220 questionnaires were distributed out of which 205 were received back.

The respondents comprised of: 33 Doctors (16%), 84 Nurses (41%), 64 Technicians (31%), 15 Trainees (7.5%) and 9 other Paramedical staff



(4.5%).where the highest gender type is female with a rate of 71% and (n=146), while the male gender had 29% and (n=59).

Reliability test has conducted to identify the Cronbach’s Alpha coefficient; according to Table (1), the collected data have a good internal consistency and reliability.

Table 1: Reliability test

	No of Items	Cronbach's Alpha
<b>Medical waste awareness</b>	10	0.831
<b>Medical waste behaviour</b>	12	0.796

Table 2 has responses to awareness-based questions on biomedical waste management. About (62%) of the respondents considered all healthcare waste to be hazardous. Similar findings were recorded that more than (90%) of medical-staff have considered all healthcare wastes are hazardous [13]. Only (19%) of the

respondents in this study believed that any plastic bag can be used for medical waste disposal. A study revealed by Aradhya [14] found about 10% of the respondents opinioned that any plastic bag can be used for waste segregation.

Table 2: Correct response for questions on awareness regarding bio-medical waste

No	Questions	Right answer	%
1	Is all medical waste dangerous?	Yes 129	<b>62%</b>
2	Can any plastic bag be used to dispose of medical waste?	Yes 39	<b>19%</b>
3	Have you had any training in biomedical waste management?	Yes 41	<b>20%</b>
4	Do you think your knowledge of biomedical waste management is sufficient?	Yes 30	<b>14%</b>
5	Do you think you need advanced training in biomedical waste management?	Yes 141	<b>69%</b>

Only (20%) of the respondents agreed that they received training in medical waste management, a similar study was conducted by Chennai [15] and Davangere [16] where the corresponding values were (28%) and (27%) respectively who received training. A negative result only (14%) felt that their knowledge of medical waste management is sufficient; study conducted by Abrol, A [14] very positive result about (83%) of the respondent felt that they have knowledge

regarding biomedical waste. Majority of the respondents (69%) need advanced training on biomedical waste management; which is similar findings of studies conducted by Kapoor [17] showed a great need to conduct continuing education and training programs.

The study shows that nearly (80%) of medical-staff did not receive any kind of training in biomedical waste management. This was similar to the findings of studies done in Puducherry

[13], nearly 50% of nursing staff and almost all the laboratory technicians and residents had not received any kind of training in bio-medical management; this study helped us to identify this gap and the necessity of training them. (69%) of

respondents expressed their interest in joining advanced training of bio-medical waste management. These results realized us that such training programs should be conducted regularly and made compulsory for all hospital staff.

Percentage of correct response regarding BMW awareness

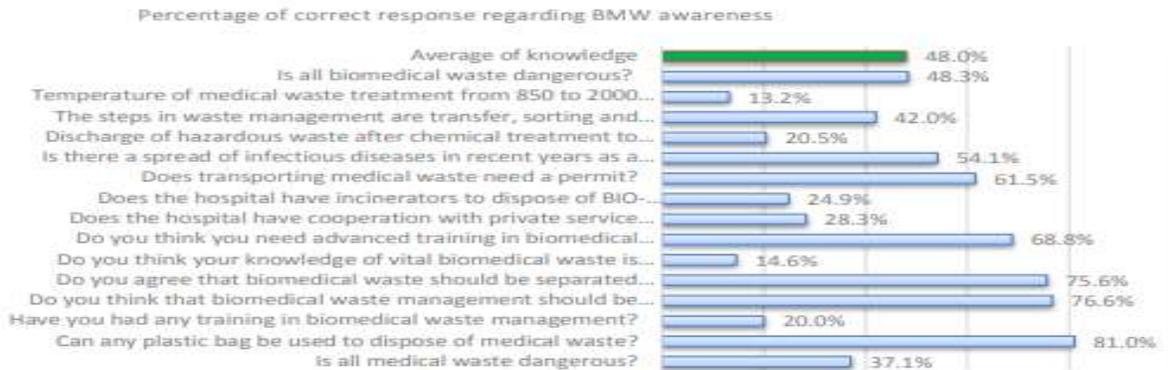


Figure No 2: Shows the percentage of correct response answers regarding knowledge of BMWM

Figure 2 shows the percentage of correct responses answers of all knowledge questions. The results indicated that average level of employee awareness towards dealing with medical and biomedical waste in Sabratha hospital was less than the average (48.3%). These results are in accordance with previous studies

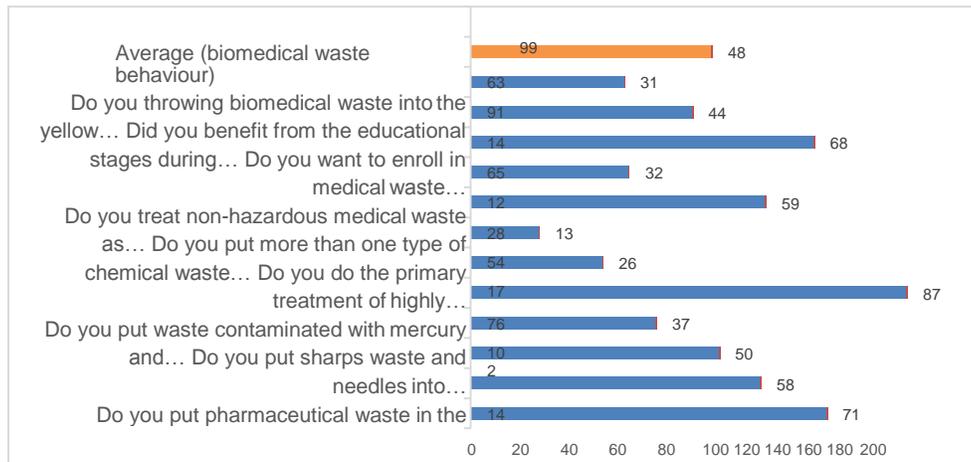
conducted in New Delhi, India [1] most of respondents were not aware of the waste management regulations. Similar results were found in a study in Agra hospital [18], which indicates a lack of knowledge and awareness among medical personnel towards legislation on bio-medical waste.

Table 3: Response to behavior based question on biomedical waste management

No	Questions	Right answer	%
1	Do you disposed all kinds of waste into the public trash?	Yes 59	29%
2	Do you put cotton waste and blood-stained gauze in the red plastic bag?	Yes 102	49%
3	Do you put waste contaminated with mercury in the yellow plastic bag	Yes 54	26%
4	Do you disposal sharps wastes and needles into designated container for it?	Yes 179	87%
5	Did you benefit from the educational stages during your studies on how to deal with medical waste?	Yes 91	44%

Table 4 has responses to practice based some questions on biomedical waste management. About (29%) disposed of all waste in the general trash. The majority of workers (49%) disposed of blood-contaminated cotton gauze, etc., in red bags. Only (26%) put waste contaminated with mercury in the yellow plastic bag, and (87%) disposal sharp wastes and needles into

designated container; This was similar to the findings of studies done in Himachal Pradesh hospital[14] about (66%) were aware about the proper method for needle disposal. Also (44%) of the workers expressed benefit from the educational stages during their studies on how to deal with medical waste.



**Figure 3: Percentage of correct response regarding BMWM behavior**

Figure (3) presents the descriptive statistics for the responses to behavior-based questions regarding biomedical waste management. The results showed that Sabratha hospital workers

have lack of behavior towards dealing with medical and bio-medical waste management with low average level (48%).

**Conclusion**

This study revealed that there are poor levels of knowledge and behavior about bio-medical waste management among health care personnel in public hospital at Sabratha City, Libya. The study indicated that there is a need enhancing

awareness among medical-staff regarding biomedical waste management. The topic should compulsory be made a part of educational curriculum or training of biomedical waste management.



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## Conflicts of interest

Authors declare no conflict of interest.

## References

1. Corrigan, Patrick W., Benjamin G. Druss, and Deborah A. Perlick. "The impact of mental illness stigma on seeking and participating in mental health care." *Psychological Science in the Public Interest* 15.2 (2014): 37-70.
2. Patil, G. V. and Pokhre1, K. Biomedical Solid Waste Management in an Indian Hospital: (2005), A Case Study, Waste Management, Pg 25, 592-599.
3. Government of India, Ministry of Environment and Forests. Bio-Medical Waste (Management and Handling) Rules. *Gazette of India*. 1998 (27 Jul). Available from: <http://envfor.nic.in/legis/hsm/biomed.html>
4. Government of India, Ministry of Health and Family Welfare (MoHFW). National Guidelines on Hospital Waste Management Based upon the Bio-Medical Waste (Management and Handling) Rules, 1998. New Delhi: MoHFW; 2002
5. Pasupathi, Palanisamy, et al. "Biomedical waste management for health care industry." *Int J Biol Med Res* 2.1 (2011):472-86.
6. WHO Hazardous Waste: Safe Disposal and Control of Health Risk. World Health Organization, Geneva(1992)
7. Sekar, M., Swapna, M., & Easow, J. E. (2018). A study on knowledge, attitude and practice of biomedical waste management among health care workers in a Tertiary Care Hospital in Puducherry. *Indian J Microbiol Res*, 5(1), 57-60.
8. Countries, Report of a Consultation on Medical Wastes Management in Developing Countries. (1992).
- 9 .Palwankar PV, Singh A. Safety and measures for auxiliary staff associated with hospital waste disposal. *IndianJournal of Dental Sciences*. 2012; 4: 104-106.
10. Ozbek M, Sanin FD. A study of the dental solid waste produced in the school of dentistry in Turkey. *Journal of Waste Management*. 2004; 25: 339-345.
11. World Health Organization (WHO). *Safe Management of Bio-Medical Sharps Waste in India: A Report on Alternative Treatment and Non-Burn Disposal Practices*. New Delhi: WHO Regional Office for South-East Asia; 2005.
12. Kishore J, Goel P, Sagar B, Joshi TK. Awareness about biomedical waste management



and infection control among dentists of a teaching hospital in New Delhi. *Indian Journal of Dental Research*. 2000; **11**:157-161.

13. Sekar, M., Swapna, M., & Easow, J. E. (2018). A study on knowledge, attitude and practice of biomedical waste management among health care workers in a Tertiary Care Hospital in Puducherry. *Indian J Microbiol Res*, 5(1), 57-60.

14. Abrol, A., Mahajan, S., Chauhan, M., & Kumar, N. Awareness and practices regarding biomedical waste management among health care workers in a tertiary care hospital in Himachal Pradesh.

15. Charania ZK, Ingle NA. Awareness and practices of dental care waste management among dental practitioners in Chennai City. *J Contemp Dent* 2011;1:1

16. Sudhir KM. Awareness and practices about dental health care waste management among dentists of Davangere City, Karnataka. *J of Indian Assoc Public Health Dent* 2006;8:44-

17. Kapoor D, Nirola A, Kapoor V, Gambhir RS. Knowledge and awareness regarding biomedical waste management in dental teaching institutions in India – a systematic review. *J Clin Exp Dent* 2014 Oct;6(4):e419-e424.

18. Sharma S. Awareness about bio-medical waste management among health care personnel of some important medical centres in Agra. *International Journal of Environmental Science and Development*. 2010; **1**: 251-255.