

Assessment of Knowledge, Attitude and Practice in Hospital Waste Management among Health Care Professionals in a Tertiary Care Hospital, Kurnool, Andhra Pradesh.

K. Suma¹, P. Sudha Kumari², B. Renuka³

¹Second Year Postgraduate Student, Department of Community Medicine, Kurnool Medical College, Kurnool, Andhra Pradesh, ²Professor and Hod, Department of Community medicine, Kurnool Medical College, Kurnool, Andhra Pradesh, ³ Associate Professor, Department of Community Medicine, Kurnool Medical College, Kurnool, Andhra Pradesh.

How to cite this article: K. Suma, P. Sudha Kumari, B. Renuka. Assessment of Knowledge, Attitude and Practice in Hospital Waste Management among Health Care Professionals in a Tertiary Care Hospital, Kurnool, Andhra Pradesh. Indian Journal of Public Health Research and Development / Vol. 16 No. 1, January-March 2025.

Abstract

Background: Enormous amounts of biomedical waste is generated in our country daily, contains hazardous and infectious materials. It is vital that healthcare professionals has correct knowledge, attitudes and practices regarding biomedical waste management.

Objectives: To assess knowledge, attitudes and practices among doctors, interns, nurses and laboratory technicians regarding bio medical waste management in a tertiary care hospital in south India.

Materials and methods: A questionnaire-based cross sectional study was conducted among 150 doctors, 60 interns, 50 nurses and 50 laboratory technicians in government general Hospital in kurnool district of Andhra Pradesh, South India.

Results: Good Knowledge was observed among 135 (90.0%) Doctors, 30 (60.0%) laboratory technicians, 29 (58.0%) nurses followed by 35(58.3%) interns, which is statistically significant. Good attitude was shown by 133 (88.7%) doctors, 33 (66.0%) nurses, 26 (52.0%) laboratory technicians, followed by 30 (50.0%) interns and the difference is statistically significant. Good Practices were followed among 134(89.3%) doctors, 30(60%) nurses, 30 (60%) laboratory technicians and 35 (58.3%) interns, which is statistically significant.

Conclusions: Overall, knowledge, attitudes and practices were better among the doctors and nurses than among the interns and laboratory technicians.

Keywords: Bio medical waste management, Health care professionals, knowledge, attitudes and practices.

Corresponding Author: K. Suma, Second Year Postgraduate Student, Department of Community Medicine, Kurnool Medical College, Kurnool, Andhra Pradesh.

E-mail: Sumakatepogu9@gmail.Com

Submission date: February 26, 2024

Revision date: April 14, 2024

Published date: December 28, 2024:

This is an Open Access journal, and articles are distributed under a Creative Commons license- CC BY-NC 4.0 DEED. This license permits the use, distribution, and reproduction of the work in any medium, provided that proper citation is given to the original work and its source. It allows for attribution, non-commercial use, and the creation of derivative work.

Introduction

Any waste produced during an animal's or human's diagnosis, treatment, or vaccination, as well as during related research or during the manufacturing or testing of biologicals, is referred to as biomedical waste¹. Every day, a variety of biomedical operations in hospitals all around the world generate massive amounts of toxic and infectious wastes. About 2 kilograms are produced per bed every day in India². In addition to strict adherence to protocol at the healthcare institution level, high-quality biological waste management requires investment in and implementation of disinfection, recycling, and disposal at the terminal site³. Health care workers who comprehend segregation and are adequately informed about biomedical waste management guidelines would be better able to dispose of trash in their organizations in an appropriate manner⁴. Teaching institutions are essential to the health care system since it is through them that aspiring medical practitioners and everyone else involved in providing care to the community receive their training⁵. Globally, there is a great deal of awareness of the risks associated with biomedical waste. Furthermore, a number of costly international interventions for the BWM have also been implemented. However, India's performance is utterly appalling and inadequate on these two fronts⁶. The most important issues surrounding healthcare waste include improper waste management, inadequate financial and human resources, ignorance of the health risks associated with biomedical wastes, and inadequate waste disposal regulation⁷. With this background, the study was carried out to assess the current knowledge, attitude and practices of the health care workers like doctors, interns, nurses and laboratory technicians in a tertiary care teaching hospital with regard to the management of BMW.

Objectives:

1. To assess the knowledge about BioMedical Waste management among doctors, interns, nurses and lab technicians of a tertiary care hospital.
2. To assess the attitude among doctors, interns, nurses and lab technicians of a tertiary care hospital with regard to BioMedical Waste management.

3. To assess the practices among doctors, interns, nurses and lab technicians nurses in a tertiary care hospital with regard to BioMedical Waste management.

Methodology

A hospital based cross-sectional study was conducted in government general Hospital, Kurnool, Andhra Pradesh, South India. The study population comprises of the following: doctors (residents), interns, nurses and laboratory technicians working in the various departments of the hospital. Study was conducted in July 2023 – November 2023. Inclusion criteria include those who are consenting for the study and those who are working in medical field for more than 3 months. Exclusion criteria include those who are not available at the time of study. Ethical clearance for the study was sought from the institutional ethics committee. Simple random sampling technique is used in the study. Assuming 50% of students are aware of biomedical waste management⁸ sample size is calculated using formula $4pq/L^2$ with 6% absolute error, a minimum sample size of 278 was calculated. Accounting for 10% non-response, it was 306 individuals which is rounded off to 310 individuals which includes 150 doctors, 60 interns, 50 nurses and 50 laboratory technicians.

Data Collection:

Cadre of staff	Participants
Doctors	150
Interns	60
Nurses	50
Laboratory Technicians	50
Total	310

A semi-structured questionnaire was used as the data collection tool. It contained 30 questions. The knowledge questions assessed the participant's knowledge on facts like – all the colour codes and their meanings, biomedical hazard symbol, incinerability of wastes. The attitude questions pertained to issues such as, whether biomedical waste was considered by the participant was hazardous. The practice questions assessed regarding usage of disinfected sharps. The self-administered questionnaires were filled by the participants. Questions to assess knowledge were of a multiple choice type where only one response was the correct one. Questions to assess attitude

were presented in the agree or disagree response format. Questions to assess practice were presented as always or never response format. Each correct and incorrect response in the knowledge section and each agree and disagree for the attitude and always and never response in practice question were given 1 and 0 mark respectively. Thus, maximum score for each section was 10 and minimum zero. It was assumed that individuals involved in the study would cooperate and give correct information. A self made scoring system was devised to categorize KAP of the study participants as good, average and poor.

A score of < 5 was categorized as poor, 5-8 as average and > 8 as good.

Data analysis: The data entry and analysis was done using SPSS version 26. The levels of KAP of doctors, nurses, lab technicians and interns regarding BWM were expressed in both frequency and percentages. To determine whether there was any association between levels of KAP and professional category chi square test was computed. P value <0.05 was considered to be significant.

Results

Table 1: Socio Demographic Characteristics of Health Care Professionals

Characteristics	Doctors	Interns	Nurses	Lab technicians
Age in years				
21-25	0(0.0%)	59(98.3%)	18(36.0%)	0(0.0%)
26-30	2(1.3%)	1(1.7%)	32(64.0%)	6(12.0%)
31-35	3(2.0%)	0(0.0%)	0(0.0%)	40(80.0%)
>35	145(96.7%)	0(0.0%)	0(0.0%)	4(8.0%)
sex				
male	80(53.3%)	19(31.7%)	21(42.0%)	36(72.0%)
female	70(46.7%)	41(68.3%)	29(58.0%)	14(28.0%)
residence				
rural	50(33.3%)	11(18.3%)	2(4.0%)	11(22.0%)
urban	100(66.7%)	49(81.7%)	48(96.0%)	39(78.0%)
religion				
hindus	100(66.7%)	40(66.7%)	31(62.0%)	28(56.0%)
muslims	25(16.7%)	5(8.3%)	6(12.0%)	12(24.0%)
christians	25(16.7%)	15(25.0%)	13(26.0%)	10(20.0%)

In the present study majority of doctors 145(96.7%) were more than 35 years, majority of lab technicians 40 (80%) belong to 31-35 years, majority of nurses 32 (64%) belong to 26-30 years and majority of interns 59 (98.3%) belong to 21-25 years. Majority of doctors 80(53.3%) and lab technicians 36(72.0%) were males

whereas majority of interns 41(68.3%) and nurses 29(58%) were females. Majority of them belong to urban residence. Majority of them belong to hindu religion with doctors 100(66.7%), interns 40(66.7%), nurses 31(62.0%) and lab technicians 28(56.0%).

Table 2: Knowledge of the Health Care Professionals

Occupation	Good	Average	Poor	P Value
DOCTORS	135(90.0%)	12(8.0%)	3(2.0%)	<0.001
INTERNS	35(58.3%)	15(25.0%)	10(16.7%)	
NURSES	29(58.0%)	14(28.0%)	7(14.0%)	
LAB TECHNICIANS	30(60.0%)	11(22.0%)	9(18.0%)	

In the present study Good Knowledge was observed among 135 (90.0%) Doctors, 30 (60.0%) laboratory technicians, 29 (58.0%) nurses followed by 35 (58.3%) interns, which is statistically significant.

Table 3: Attitude of the Health Care Professionals

OCCUPATION	GOOD	AVERAGE	POOR	P VALUE
DOCTORS	133(88.7%)	10(6.7%)	7(4.7%)	<0.001
INTERNS	30(50.0%)	18(30.0%)	12(20.0%)	
NURSES	33(66.0%)	10(20.0%)	7(14.0%)	
LAB TECHNICIANS	26(52.0%)	15(30.0%)	9(18.0%)	

In the present study Good attitude was shown by 133 (88.7%) doctors, 33 (66.0%) nurses, 26 (52.0%) laboratory technicians, followed by 30 (50.0%) interns and the difference is statistically significant.

Table 4: Practices of the Health Care Professionals

OCCUPATION	GOOD	AVERAGE	POOR	P VALUE
DOCTORS	134(89.3%)	11(7.3%)	5(3.3%)	<0.001
INTERNS	35(58.3%)	15(25.0%)	10(16.7%)	
NURSES	30(60.0%)	15(30.0%)	5(10.0%)	
LAB TECHNICIANS	30(60.0%)	11(22.0%)	9(18.0%)	

In the present study Good Practices were followed among 134(89.3%) doctors, 30(60%) nurses, 30 (60%) laboratory technicians and 35 (58.3%) interns, which is statistically significant.

Discussion

Biomedical wastes are generated from all levels of health care facilities. Segregation of biomedical waste at the point of generation not only reduces the financial expenditure for management of BMW, but also the health hazards due to handling of these wastes. BMW management system of our Institution has been analysed using three determinants, KAP.

Study participants were from various groups (group I-doctors, group II interns, group III- nurses, group IV-laboratory technicians) belonging to our Institution. In the present study majority of doctors 145(96.7%) were more than 35 years, majority of lab technicians 40 (80%) belong to 31-35 years, majority of nurses 32 (64%) belong to 26-30 years and majority of interns 59 (98.3%) belong to 21-25 years. Soyam GC et al⁹ in their study showed among health care workers in Delhi where majority of the participants were in the age group of 30.3±5.6 years. Majority of doctors 80 (53.3%) and lab technicians 36(72.0%) were males whereas majority of interns 41(68.3%) and nurses 29(58%) were females. Majority of them belong to urban residence. Majority of them belong

to hindu religion with doctors 100(66.7%), interns 40(66.7%), nurses 31(62.0%) and lab technicians 28(56.0%). The decreasing order of knowledge, attitude and practice seen among the four groups was doctors, followed by nurses, laboratory technicians and interns. In the present study doctors had good knowledge regarding BMW than nurses similar to that conducted by Narang et al¹⁰, opined knowledge was more among the doctors followed by nurses and other paramedical staffs. Deo D et al¹¹, in their study opined nurses and lab technicians had better knowledge (90%) than medical staff like doctors (80.6%), in contrast to our study where doctors had better than nurses and lab technicians. Vishal et al¹² who in their study in a tertiary care hospital in Bhopal reported that the overall awareness about BWM was highest among the medical professionals. Another study by Madhukumar Set al¹³ showed that nurses had better attitude than technicians similar to our study where nurses showed better attitude than lab technicians. Reason for lower KAP values among nurses could be explained by the fact that majority of participants in nurses group were newly recruited juniors, as the senior nurses who had busy work schedule were unable to participate in the study. This is supported by the study done by Ajmera V et al¹⁴, which showed newly appointed nurses used colour coded bins inappropriately. HealthCare Professionals

of our Institution has got better attitude towards BMW management when compared to knowledge and practice. This could be due to the reason that questions on knowledge were answered only if theoretical knowledge was sound and questions on attitude were answered easily because options were of affirmative type.

The study by Ajai Singh et al¹⁵ showed that nurses had better attitude and practice of BMW management even more than doctors on contrary to our study where doctors had better attitude and practice towards BMW management than nurses. Another study by Madhukumar S et al¹³ showed that nurses had better attitude than technicians which is similar to our study where nurses showed better attitude than lab technicians. In the present study, doctors were the toppers in all three determinants and nurses had better KAP values than laboratory technicians where as in a study by Mathur V et al¹⁶, on knowledge, attitude and practices about biomedical waste management was found to be better among nurses as compared to doctors. Training of all cadres of staff will help in the analytical evaluations for suitable and applicable management of biomedical waste¹⁷. It is hoped that these findings would help to enhance the effectiveness of orientation or refresher training programmes targeted at these individuals and help make them more focused, relevant and goal-oriented. Thus, as this knowledge spreads to other parts of the nation through this human resource, it will lead to the right annihilation of biomedical wastes, successful reuse, and environmental safety not only in one hospital hub but also elsewhere.

Conclusion

Knowledge, attitude and practice towards biomedical waste management were better among the doctors and nurses than the other cadre of staff. So continuing medical education program on BMW is mandatory atleast once in a year to train new batches of postgraduates, interns, newly appointed health care workers and serves as an update for the existing health care workers.

Good knowledge of the health care professionals may lead to a positive attitude and proper practice. Importance of adequately supported IEC strategies (information, education and communication) like

handouts, stickers, charts, celebrations of various days like hand hygiene day and other days etc. can help in improving the practices of the employees of the organizations.

Conflict of Interest: Nil

Source of Funding: Nil

Ethical Clearance: Taken from institutional ethical committee Date- 25/7/2023 ,reference no- 362/2023

Source of Funding: Self

References

1. Biomedical Waste (Management and Handling) Rules 1998, 2000, Ministry of Environment and Forests Notification, New Delhi
2. Patil AD, Shekdar AV. Health-care waste management in India. *J Environ Manage.* 2001;63:211-20.
3. Pattnaik S, Reddy MV. Assessment of Municipal Solid Waste management in Puducherry (Pondicherry), India. *Resources, Conservation and Recycling.* 2010;54:512-20.
4. Kini B S, Kumar , Kumar S, Reddy M, Nabar A S, Kamath V G, Kamath A, Eshwari K, Knowledge, Attitudes and Practices regarding Biomedical Waste Management among staff of a tertiary healthcare centre in coastal Karnataka, *J Pub Health Med Res;* 2(1):20-4 (2014).
5. Radha R. Assessment of existing knowledge, attitude, and practices regarding biomedical waste management among the health care workers in a tertiary care rural hospital. *Int J Health Sci Res;* 2(7):14-19 (2012).
6. 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, India. *Indian J Dent Res.* 2000;11:157-61.
7. Plianbangchang PH. "A Report on Alternative Treatment and Non-Burn Disposal Practices"; Safe Management of Bio-medical Sharps Waste in India. W.H.O. Publication.
8. Saini S, Nagarajan SS, Sarma RK. Knowledge, Attitude and Practices of Bio-Medical Waste Management Amongst Staff of a Tertiary Level Hospital in India. *Journal of the Academy of Hospital Administration [Internet].* 2005 Jan-Dec [cited 2013 November 3];
9. Soyam GC, Hiwarkar PA, Kawalkar UG, Soyam VC, Gupta VK. KAP study of biomedical waste

- management among health care workers in Delhi. *Int. J Community Med Public Health*.2017;4(9):3332-7
10. Narang RS, Manchanda A, Singh S, Verma N, Padda S. Awareness of biomedical waste management among dental professionals and auxiliary staff in Amritsar, India. *Oral Health Dent Manag*.2012;11:162-8
 11. DeoD, TakSB, MundeSS. A study of knowledge regarding biomedical waste management among employees of a teaching hospital in rural area. *JIndian Soc Hospital Waste Management*. 2006;5(1):12-6
 12. Bathma V, Likhari SK, Mishra MK, Athavale AV, Agarwal S, Shukla US. Knowledge assessment of hospital staff regarding biomedical waste management in a tertiary care hospital. *Nat J Commun Med* 2012;3(2):197-200.
 13. Madhukumar S, Ramesh G. Study about awareness and practice about health care waste management among hospital staffs in a Medical College Hospital, Bangalore. *Int J Basic Med Sci* 2012;3:8-9.
 14. Ajmera V, Jayalakshmi LS. A study to assess the knowledge regarding biomedical waste management among B.sc nursing students of selected nursing colleges of Udaipur (Raj). *International Journal of Science and Research* 2016;5:1734-8
 15. Ajai S, Nath RS. Knowledge, attitude and practice of biomedical waste management amongst staff of Institutionaltrauma center level II. *Int J Res Health Sci* 2013;1:62-8
 16. Mathur V, Dwivedi S, Hassan MA, Misra RP. Knowledge, attitude and practices about biomedical waste management among health care personnel: a crosssectional study. *Indian J Community Med* 2011;36:143-5
 17. Pandit NB, Mehta HK, Kartha GP, Choudhary Sk. Management of biomedical waste: Awareness and practices in a district of Gujarat. *Indian J Public Health*; 49: 245-7 (2005).