Original Article

Knowledge, Attitude and Practice of Health Care Institutions and their Staff Involved in Hospital Solid Waste Management

Banstola D[1], Banstola R[2], Nepal D[3], Baral P[4]

[1]Physiology Department, Institute of Medicine, Maharajgunj Campus, Kathmandu, [2]Institute of Engineering, Pashchimanchal Campus, Lamachaur, Pokhara, [3]National Academy of Medical Sciences, Kanti Children Hospital, Kathmandu, [4]Anatomy Department, Gandaki Medical College, Pokhara, Kaski, Nepal

Correspondence to: Dr. Prakash Baral,

Email: prakashbaral2002@hotmail.com

Abstract

Introduction: Knowledge, attitude, and practice (KAP) among health care workers are first key steps in developing a successful infection control program. Without good knowledge, attitude and practice, hospital waste cannot be managed effectively. The hospital waste possesses specific problems due to presence of sharps, infectious and hazardous materials in it. The unmanaged hospital solid wastes not only affect patients, attendants, nurses and medical personnel but also have impact on general population, scavengers and sanitary personnel handling waste. On account of lack of knowledge, attitude and practice of health care institutions and their staff, hospital solid waste can be a source for transmission of infectious diseases like AIDS, Hepatitis B, Hepatitis C, Tetanus, Diarrhea, Tuberculosis, Cholera and so on.

Methods: It is a descriptive cross-sectional study conducted among the waste management staff working in 14 health care institutions (HCIs) of Pokhara Sub-Metropolitan City, Kaski district, Nepal. Semi-structured, self administered questionnaire consisting of questions on knowledge, attitude and practice on hospital waste management were prepared for conducting in-depth interviews and information was recorded as provided by key respondents. Housekeeping officer, senior nurse and senior waste collector/ handler of each sampled health care institutions were taken as key respondents to collect information for questionnaire survey.

Results: This study assigned that 21.43% of housekeeping officers, 35.71% of senior nurses and 28.57% of senior waste collectors received training on hospital solid waste management. Out of the 14 HCIs surveyed, 100% of them were provided with face mask and utility gloves; 35.71% were provided with boots; 14.28% were provided with plastic apron and trousers; 7.14% were provided with eye protector and no single institution provided helmet, long sleeved shirt and respirator to waste handling staff. The study also examined that 35.71% of housekeeping officers, 50% of senior nurses, and 14.29% of senior waste collectors were vaccinated against Hepatitis B. On the other hand, 85.71% of housekeeping officers, 85.71% of senior nurses, and 71.43% of senior waste collectors were vaccinated against Tetanus.

Conclusion: Knowledge, attitude and practice on hospital solid waste management were not given due attention by the HCIs and their staff involved in hospital waste management. The waste handlers were unaware about their health. The lack of awareness and accountability from actors in health care waste management lacked of well trained human resources were the major challenges to promote effective health care waste management system. Hospital solid waste management should be operated by well trained and well motivated personnel. Key respondents who should be one of the group of actors in each health care institution (HCI) should be related to waste management field and well trained to understand architecture, and chemistry of the problem.

Key words: Attitude, knowledge, hospital staff, practice, waste management

Introduction

Knowledge, attitude, and practice (KAP) among health care workers (HCWs) are first key steps in developing a successful infection control program.[1,2] For effective management of hospital waste, good knowledge, attitude and practice is a vital requirement for staff of health care institutions to avoid serious health problems within health care institutions as well as outside environment and society. Any organization depends on employees to make it effective, efficient and economic operation to achieve designed objectives. Organization is nothing and meaningless without human resource having knowledge on specified field, positive attitude and best practice. Human resource is more important for the proper treatment and disposal of hospital waste in an effective way. Getting and keeping such human resource is equally important for this purpose.

Training is a learning process which not only sharpens the employee by acquisition of skills, concepts, rules or attitudes to increase the performance but also maintains valuable and knowledgeable work force. Training given to operative employee provides the waste management staff with required knowledge and skills to the point where employees can do the current job for achieving proper and scientific hospital waste management. Thus training is the most important factor for effective management of health care waste in the hospitals (health care institutions HCIs). Understanding architecture helps to know how wastes can be reduced, reused and recycled to the greatest possible extent. Knowledge relates to the concepts, tools, and categories creating, storing, applying, and sharing information. The actors of hospital waste management with appropriate skills and knowledge can add value in the decision making process. Employees having positive attitude may thus lead to creativity, innovation, and change where actions are needed for achieving best practice for hospital solid waste management. Practice is the performance or application what has been planned, and way of doing which is common or habitual. All HCIs gave only general information of few minutes to their waste related personnel about waste management before starting employment.

Precaution and awareness during handling and disposal of health care waste is very important, because there is high risk of injuries by contaminated sharps. Those people who are involved in waste handling of hazardous wastes are vulnerable to transmission of infectious diseases like, AIDS/HIV, Hepatitis B, Hepatitis C, Tuberculosis, Diarrhea and Cholera. Most of the HCIs were unaware for vaccinating their staff like housekeeping officers, nurses and waste handlers against Hepatitis, TB, and Tetanus, who directly involved in the handling and disposal of different wastes.

Objective

The objective of this study was to assess the Knowledge, attitude and practice (KAP) of health care institutions/ hospitals and their staff involved in hospital solid waste management in Pokhara Sub-Metropolitan City, Kaski district, Nepal.

Methodology

It is a descriptive cross-sectional study conducted among the waste management staff working in 14 numbers of health care institutions with inpatient facilities in Pokhara Sub-Metropolitan City, Kaski district, Nepal. During the study, 14 numbers of hospitals (health care institutions. HCIs) were visited. Self administered questionnaire consisting of questions on knowledge, attitude and practice on hospital solid waste management was prepared to meet the objective of the study. The personnel in the administrative section of the health care institutions were contacted for the basic information. Housekeeping officer, senior nurse and senior waste collector/handler in each institution were contacted and total of 42 numbers were taken as key respondents for questionnaire survey to get detailed information conducting in-depth interviews. The collected information was coded and entered into a computer and tables, graphs and percentage were prepared; and used as analysis tools. The study was conducted after getting approval from sampled healthcare institutions and informed consent was obtained from all the respondents of sampled health care institutions.

1. At present, what is the total number of staff and number of person involved in collection, handling, and storage of hospital waste?

   Total number of staff: ……...…….

   Number of waste management staff: ……..

2. Have the staff received any training programme to educate them on hospital waste management?

   a) Yes b) No

If yes, what type of training?

a) Workshop b) Seminar c) Meeting d) Pamphlet

e) Hospital policy f) Conference g) If other, specify……..

3. Is there any vaccination given to the person involved in collection, handling, storage, and disposal of hospital waste?

Hepatitis B Yes/No

Tetanus Yes/No

If other, specify……

4. Which type of personal protective equipment (PPE) is in practice for a person involved in collection, handling and storage of hospital waste?

a) Helmet b) Face mask c) Eye protector d) Plastic aprons

e) Thick gloves f) Boots g) Trousers h) Long- sleeved shirt

i) Respirator j) If other, specify…….....

Results

Human Resource

Employees play important role in an organization. Human resource is more important than the sophisticated technology and almost any system for treatment and disposal that is operated by well trained and well motivated personnel who were involved in the hospital solid waste management. All HCIs were found lacking separate committee or department to look ahead for effective waste management; also housekeeping officer of related field was not appointed officially rather belonged to administrative staff in every health care institution working part-time for waste management. The highest number of waste management staff was found at Western Regional Hospital, accounting 67 for 350 beds, and the lowest was found at Buddha Hospital, accounting 1 for 25 beds. The number of bed per waste management staff was found highest at Buddha Hospital for 25 beds and the lowest in Pokhara Hospital for 4.17 beds. It was also found that average number of beds was 7.91 per waste management staff. The number of bed per waste management staff is given in Table 1.

Table 1: Number of Bed per Waste Management Staff.

S.N.	Name of HCIs	No. of Beds	No. of Waste Mgmt. Staff	No. of Bed Per Waste Mgmt. Staff
1	Abihiyan Community Hospital	25	5	5
2	Buddha Hospital	25	1	25
3	Charak Hospital	51	4	12.75
4	Fewa City Hospital	48	6	8
5	Fishtail Hospital	50	10	5
6	Green Pasture Hospital	73	7	10.43
7	Himalayan Eye Hospital	51	8	6.4
8	Manipal Teaching Hospital	700	60	11.67
9	Model Health Care Hospital	25	4	6.25
10	Padam Nurshing Home	50	7	7.14
11	Pokhara Hospital	25	6	4.17
12	Pokhara Om Hospital	30	6	5
13	Shree Ram Hospital	16	1	16
14	Western Regional Hospital	350	67	5.22
Total		**1519**	**192**	**7.91**

Training on Waste Management

Training is the most important factor for effective management of health care waste in the HCIs. Training provides the waste management staff with required knowledge for proper and scientific hospital solid waste management. The status of the training of the respondents on waste management in HCI is given in Table 2.

Table 2: Training Received by Respondents about Waste Management in HCIs

Training Status	Housekeeping Officer		Senior Nurse		Senior Waste Collector		Total Number
	No.	%	No.	%	No.	%	
Training Received	3	21.43	5	35.71	4	28.57	12
Not Received	11	78.57	9	64.29	10	71.43	30
Total	**14**	**100**	**14**	**100**	**14**	**100**	**42**

As per study, it was found that 21.43% of housekeeping officers, 35.71% of senior nurses, and 28.57% of senior waste collectors had received training on waste management, and the rest were lacked it. This analysis noted that there was lack of skilled manpower of appropriate training, education, and information to manage health care waste in most of the HCIs. As per study it was concluded that continuous training and education to the actors of health care waste management is very urgent.

Personal Protective Means or Equipment for Occupational Health and Safety

Hospitals (health care institutions HCIs) should provide hospital waste management staff with personal protective means like helmet, masks, plastic aprons, eye protectors, thick gloves, boots etc. for their safety. Those people who are involved in waste handling of hazardous wastes are vulnerable to transmission of infectious diseases like AIDS/HIV, Hepatitis B. The table below gives the details about use of personal protective means in the HCIs.

Table 3: Use of Personal Protective Means or Equipment in the HCIs.

Type of Personal Protective Means	Use of Personal Protective Means				
	Used		Not in Used		Total Number
	No.	%	No.	%	
Helmet	_	_	14	100	14
Face Mask	14	100	_	_	14
Eye Protector	1	7.14	13	92.86	14
Plastic Apron	2	14.28	12	85.72	14
Thick Gloves	14	100	_	_	14
Boots	5	35.71	9	64.29	14
Trousers	2	14.28	12	85.72	14
Long Sleeved Shirt	_	_	14	100	14
Respirator	_	_	14	100	14

In all 14 HCIs surveyed, 100% of respondents were provided with face mask and utility gloves, 35.71% were provided with boots, 14.28% were provided with plastic apron and trousers, 7.14% were provided with eye protector, and no single institution provided helmet, long sleeved shirt, and respirator to waste handling staff. It was noted that occupational health & safety issues was not given due attention by the HCIs and the waste handlers were unaware about their health. Though utility gloves, face masks, and aprons were provided to waste handlers by health care institutions, in real practice use of these personal protective equipments were not found proper during their working hours. Some of the waste handlers claimed that they were feeling uncomfortable to work with wearing personal protective equipment. This is because of their lack of awareness about potential risk associated with health care waste, sheer negligence, and ignorance.

Vaccination

Most of the HCIs were unaware for vaccinating their waste related staff who directly involved in the handling and disposal of waste such as housekeeping officer, nurse and waste handlers against Hepatitis, TB, and Tetanus. The responses received in this regard are given in Table 4.

Table 4: Vaccination Given to the Respondents in HCIs

Name of Vaccination	Housekeeping Officer				Senior Nurse				Sr. Waste Collector			
	Given		Not Given		Given		Not Given		Given		Not Given	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Hepatitis B	5	35.7	9	64.71	7	50	7	50	2	14.3	12	85.71
Tetanus	12	85.7	2	14.29	12	85.71	2	14.29	10	71.4	4	28.57

Out of the 14 respondents of each type, 35.71% of housekeeping officers, 50% of senior nurses, and 14.29% of senior waste collectors were vaccinated against Hepatitis B. On the other hand, 85.71% of housekeeping officers, 85.71% of senior nurses, and 71.43% of senior waste collectors were vaccinated against Tetanus. This reveals that HCIs did not provide facilities for mass vaccination to their staff, and they were found to be in high potential risks associated with health care wastes.

Discussion

Occupational health & safety issues were not given due attention by the HCIs and the waste handlers were unaware about their health. Though utility gloves, face masks, and aprons were provided to waste handlers by health care institutions, in real practical use of these personal protective equipments were not found proper during their working hours. Out of the 14 HCIs surveyed, 100% HCIs were provided with face mask and utility gloves, 35.71% were provided with boots, 14.28% were provided with plastic apron and trousers, 7.14% were provided with eye protector, and no single institution had provided helmet, long sleeved shirt, and respirator to waste handling staff.

Knowledge, attitude, and practice (KAP) among health care workers is a key first step in developing a successful infection control program.[1,2] In an effort to raise awareness and provide guidance in combating hospital acquired infections (HAIs) in resource limited settings, the World Health Organization (WHO) launched the Global Patient Safety Challenge: Clean Care is Safer Care Campaign.[3] A cornerstone of the program is to decrease HAIs through proper scientific management of hospital waste. For this, the WHO has outlined a definite framework that consists of important measures like the adequate use of personal protective means like gloves, helmet, glass, masks etc .[4-6] While adherence with WHO guidelines for hospital waste management is not effective in both developed and developing nations, barriers to implementation of a successful hospital waste management program may be different in resource limited settings.[7] Poor compliance is associated with lack of awareness among health care institutions and staffs.[8] The other factors are organizational attitude towards, cost containment in conducting trainings, vaccinations, personal protective means for waste management staff.[9] The education regarding HAIs has a positive impact on retention of KAP in all categories of health workers to prevent infections.[10]

Out of the 14 respondents of each type comprised that 21.43% of housekeeping officers, 35.71% of senior nurses, and 28.57% of senior waste collectors had received training on hospital waste management and rest had not received any type of training on it. This depicted that there was lack of skilled trained manpower and also lack of appropriate training, education and information to manage health care waste in most of the HCIs.

Out of the 14 respondents of each type, 35.71% of housekeeping officers, 50% of senior nurses, and 14.29% of senior waste collectors were vaccinated against Hepatitis B. On the other hand, 85.71% of housekeeping officers, 85.71% of senior nurses, and 71.43% of senior waste collectors were vaccinated against Tetanus. This shows that HCIs had not conducted mass vaccination to their staff, and they were found to be in high potential risks associated with health care wastes.

Conclusion

All HCIs were found lacking of separate committee or department to look ahead for effective waste management, as well as housekeeping officer of related field was not appointed officially. Hospital waste management should be operated by well trained and well motivated personnel. Occupational health & safety issues was not given due attention by the HCIs. Though utility gloves, face masks, and aprons were provided to waste handlers by health care institutions, in real practice these personal protective equipment were not found in proper use during their working hours due to lack of motivation.

Most of the HCIs were unaware for vaccinating waste related staff such as housekeeping officers, nurses and waste handlers against Hepatitis, TB, and Tetanus, who directly involved in the handling and disposal of different wastes. Vaccination against Hepatitis, TB, and Tetanus should be carried out for the hospital staff who are directly involved in the handling and disposal of waste by the concerned hospital management. Health care institutions (HCIs) should develop management plans and policies about human resource management backed with trained and motivated personnel adopting not in anyone's backyard (NIABY) concept of hospital solid waste management rather than not in my backward (NIMBY) in future and made aware of the potential risks of mishandling wastes.

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Conflict of interest: None declared.

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