An Evaluation of Health Care Waste Management in Base Hospitals of Colombo District

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Abstract

Introduction
Current Health Care Waste Management (HCWM) situation in Sri Lanka needs drastic improvement in order to reduce the direct/indirect adverse health impacts to health personnel and public.

Objective
The study aimed at evaluating HCWM of the two base hospitals in Colombo district.

Methodology
In a hospital based descriptive cross-sectional study in both base hospitals in the Colombo district, processes followed in relation to HCWM and availability of facilities for HCWM were assessed using an observation checklist and knowledge, attitude and practices of nursing officers (n=328) were studied using a self-administered questionnaire.

Results
A majority of nursing officers (97.8%) were females. Though a majority (57.9%) had >10 years working experience, only 36.9% had received a formal training in HCWM. Overall knowledge regarding HCWM was 'poor' in 59.5%. A majority of study population had favourable attitudes in implementing HCWM and 'good' practices related to HCWM (74.8%).

Conclusion
Many gaps were identified in both hospitals in processes followed in relation to HCWM and facilities needed for effective HCWM.

HCWM in both hospitals need improvement. Processes related to HCWM need to be regularized and facilities should be provided. Knowledge gaps among nursing officers need to be bridged by educational programmes to sustain the favourable attitudes and to further improve practices.

Key words: Evaluation waste management, health care units

Introduction

Improper disposal of health care waste poses a great risk to humans, worldwide. It contaminates the natural environment (air, water, soil, fauna and flora) and the manmade environment, thereby affecting the wellbeing and health of humans. All over the world there is evidence of major health effects related to improper disposal of healthcare waste (1).

Health Care Waste Management (HCWM) is an integral part of hygiene and infection control within a health care facility and a proper management of waste helps in controlling nosocomial infections (2). All individuals exposed to improperly managed HCWM are potentially at risk of being injured or infected. The most vulnerable groups include medical staff namely, doctors, nurses, sanitary staff and hospital maintenance personnel. Patients receiving treatment in the health care facility, their visitors and the general public are also at risk of being injured or infected through health care waste (HCW) (2).

The National Environment Act (NEA) of No. 47 of 1980 with its amendments is the basic legal documents that regulate the management of hazardous waste in Sri Lanka (3). Further to these legal provisions, on 1st of February 2008 a Gazette notification announced the necessity for all health institutions in the country to obtain a license for health waste management even though, organized safe HCWM systems were scarce in health institutions of the country at that time. Realizing this deficiency, Ministry of Health jointly with Central Environment Authority has taken the initiative to implement HCWM plans in all the health institutions in the country commencing from central and provincial institutions. This initiation has given recognition to the significant role played by the nurses to ensure an effective process of HCWM from

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the point of waste production to transport of waste out of the wards to the central storage. Hence, improving knowledge attitudes and practices of health care workers especially nursing officers has been included as an integral part of HCWM plans. However, existing levels of knowledge, attitudes and practices regarding HCWM has not been assessed in detail in Base Hospitals in the country (4).

This study aimed at evaluating HCWM of the base hospitals in Colombo districts by assessing the processes these institutions followed in relation to HCWM and availability of facilities for HCWM. Description of knowledge, attitude and practices of nursing officers in these institutes was also aimed as a part of the evaluation. Since this evaluation in November 2008 to January 2009, no formal HCWM project has been implemented in these two base hospitals up to May 2011, indicating that the situation remains same.

Methodology

This descriptive cross-sectional study was conducted at two base hospitals in the district of Colombo at Avissawella and Homagama. Data collection period was November 2008 to January 2009.

Evaluation of HCWM included three different aspects. A description of knowledge, attitude and practices of nursing officers, an assessment of the processes these institutions followed in relation to HCWM and an assessment of availability of facilities for HCWM were these three aspects.

A pre-tested structured self-administered questionnaire was used to assess knowledge, attitude and practices of nursing officers in these institutes regarding HCWM. The study planned to include all the nursing officers in both hospitals (n=343) on duty, in the assessment. A list of all the nursing officers on the duty roster of the Medical, Surgical, Gynaecology and Obstetrics, Paediatrics, Eye and Ear, Nose and Throat wards at the time of the survey was obtained from the data base of administration units of both hospitals. Principal investigator obtained informed verbal consent and recruited all the nursing officers attached to each ward by visiting each of these wards on several occasions. A pre-tested self administered questionnaire was the tool used to obtain data. During most of the occasions the principal investigator met the nursing officers by appointments and distributed and collected the filled questionnaires at the same time. Care was taken to avoid discussions among nurses when responding to the questionnaire. On few occasions that this could not be done, they were collected after allowing the shortest time interval as possible.

A pre-tested structured observation checklist developed based on the standards of National Guidelines of HCWM in Sri Lanka was used to assess processes each ward of the two hospitals followed in relation to HCWM and availability of facilities for HCWM in each ward of the two hospitals. Principal investigator did all the observations.

The data were analyzed using software package of SPSS Version 10. Knowledge related to colour coded segregation, infectious waste management and sharp waste management was assessed using a comprehensive set of questions. Each question related to these aspects was assigned a weighted score in which high weights were assigned to the items related to core knowledge that is accepted as requirement to implement a HCWM properly. Based on the score study units were categorized as having 'good' or 'poor' knowledge related to that aspect of HCWM. Further, an 'overall knowledge' score was also calculated for each study unit by combining scores of all aspects of knowledge. Based on this 'overall knowledge' score participant were categorized into two levels of overall knowledge on HCWM as 'poor' and 'good'.

The study also inquired into different aspects of attitudes in related to HCWM.

Practices related to colour coded segregation, infectious waste management and sharp waste management was also assessed using a comprehensive set of questions. Each question related to these aspects was assigned a weighted score in which high weights were assigned to the items related to basic practices that is accepted as essential to implement a HCWM properly. Based on the score for each aspects study units were categorized as having 'good' or 'poor' practices related to that aspect of HCWM.

Ethical clearance was obtained from the Ethical Review Committee of the Faculty of Medical Sciences, University of Sri Jayawardenapura and administrative approval was obtained from Provincial Director of Health Services of Western Province, Regional Director of Health Services of Colombo, District and from relevant Medical Superintendents of the hospitals.

Results

Study included 328 of 343 eligible nurses with a response rate of 95.6%. A majority nursing officers (321/328, 97.8%) were females. Of the nursing officers, 12.8% had a Diploma qualification. In grade seniority approximately half (46.6%) were in 'Grade 2A'. A majority (57.9%) had >10 years working experience (Table 1).

Table 1: Distribution of educational qualifications, grade seniority and experience of the nursing officers

Characteristic	No (n=328)	Percentage
Highest educational qualification		
Having passed GCE Advanced level	285	86.9
Diploma	42	12.8
Basic degree	1	0.3
Grade seniority		
Special Grade	6	1.8
Grade1	123	37.5
Grade2A	153	46.6
Grade 2B	46	14.0
Years of service		
Less than5 years	46	14
5-10 years	92	28.1
More than 10 years	190	57.9

Table 2: Distribution of educational the nursing officers by their attitudes related to HCWM

Attitude regarding HCWM	Strongly Agree/agree		no comment		Strongly disagree/ disagree		total	
	No.	%	No.	%	No.	%	No.	100.0
HCWM is an essential feature of a good health care system	238	72.6	33	10.1	57	17.4	328	100.0
HCWM is not a priority as the system is overburdened with patient care	23	7.0	36	11.0	269	82.0	328	100.0
Spending for HCWM is waste of resource	55	16.8	46	14.0	227	69.2	328	100.0
Spending time of nursing staff on HCWM is a waste of time	59	18.0	18	5.5	251	76.5	328	100.0
HCWM is an unnecessary extra work for busy health care workers	26	7.9	23	7.0	279	85.1	328	100.0
HCWM should be undertaken by health personnel to protect them selves	260	79.3	19	5.8	49	14.9	328	100.0
HCWM should be undertaken to protect public	284	86.6	13	4.0	31	9.4	328	100.0
legal frame work in relation to HCWM is not to be taken seriously	123	37.5	13	4.0	192	58.5	328	100.0

The nursing officers were inquired into whether they have received any form of training regarding HCWM. The proportion of nursing officers who reported that they received any form of training on HCWM was only 36.5%. Regarding receipt of related training 16.5% had received formal training on infection control while 19.2% a formal training on improving productivity.

In assessing the knowledge of nursing officers regarding different aspects of HCWM, based on a weighted score obtained for a series of questions it was shown that 58.8% of nursing officers had 'good' knowledge regarding colour coded disaggregation of waste. The proportions of nursing officers who had 'good' knowledge regarding sharp waste management was 70.2% while the corresponding proportion regarding 'infectious waste management' was 42.9%.

In categorization based on the 'overall knowledge' 40.5% was shown to have 'good' overall knowledge while 59.5% had 'poor' overall knowledge regarding HCWM.

Different aspects of attitudes in related to HCWM were inquired into. A majority of the nursing officers had favourable attitudes related to HCWM as indicated by the pattern of responses to all the statements in Table 2.

The information gathered though observation checklist revealed that none of the hospitals had a functioning 'waste management committee' nor a 'waste management plan' which are requirements under the national guidelines. Information related to processes of waste segregation, storage and transport processes in the wards of the two hospitals gathered by the observation checklist is shown in Table 3.

Table 3: information related to processes of HCWM in two hospitals

Aspect of HCWM	Hospital I			Hospital II		
	Recommended standards			Recommended standards		
	Met in all wards	Not met in all wards	Not practiced	Met in all wards	Not met in all wards	Not practiced
Waste segregation						
Separation into at least 3 categories	✓			✓		
Recommended colour code practiced		✓		✓		
Different bins used are clearly labeled			✓			✓
Waste storage						
Separate temporary storage areas for waste available		✓			✓	
Separate containers to store hazardous waste available		✓		✓		
Temporary storage areas located away from patient area		✓			✓	
Periodic cleaning and disinfection of temporary storage areas and containers		✓			✓	
Waste transport						
Dedicated trolleys or wheeled containers to transport waste available			✓			✓

In assessing the practices of nursing officers regarding different aspects of HCWM, based on a weighted score obtained for a series of questions it was shown that 85.7% of nursing officers had 'good' practices regarding colour coded disaggregation of waste. The proportions of nursing officers who had 'good' practices regarding sharp waste management was 78.7% while the corresponding proportion regarding 'infectious waste management' was 71%.

In categorization based on the 'overall practice' 74.8% was shown to have 'good' overall practice while 25.2% had 'poor' overall practice regarding HCWM.

Of the processes observed, only 'separating waste into at least 3 categories' met the recommended standard in all wards of the hospital I. Other than this requirement, all wards in hospital II used 'recommended colour code in segregation' and had 'separate containers to satire hazardous waste'.

Also the observation checklist was used to assess the procedures followed and facilities available for final treatment and disposal of infectious waste and sharp wastes in the two hospitals.

None of the two hospitals had incinerators with standards recommended by the national guidelines. None of the two hospitals used autoclave to disinfect

infectious waste. Open air burning/burning in a substandard incinerator of sharp waste and open air burning, burying in pits and handing over to municipality waste collection system were the methods adopted for infectious waste.

Discussion

Findings of this study can be considered as a comprehensive evaluation of the HCWM situation of the two hospitals as it assessed the processes and facilities as well as the relevant knowledge, attitude and behaviours among nursing officers who would be the key health care personnel in implementing the HCWM process once it is established. The study found that only about one third (36.5%) of the nursing officers had received training on HCWM even though approximately two thirds (57.9%) had more than 10 years working experience. This indicates the need to scaling up of HCWM formal training programmes. Even in the absence of formal training it was expected that nursing officers would have a good level of knowledge on HCWM due to their long years of service which would have given them on–the-job training opportunities. However, the findings revealed that a majority (59.5%) had 'poor' overall knowledge. The assessment of knowledge on HCWM in this study was mostly aimed at assessing the specific important technical details related to HCWM. The poor 'overall knowledge revealed by the study even when most nursing officers have had long years of service experience indicates that educating nursing officers regarding of HCWM cannot be expected through work experience or notification of circulars. The importance of detailing specific information on HCWM by way of training (5) is reiterated with this finding. Most of the surveys regarding HCWM in South East Asian Countries also have identified the lack of training as the main reason for poor HCWM (7-12).

Attitudes are evaluative statements, either favourable or unfavourable. There is a behavioral component to the attitude. More recent researches have demonstrated that attitude significantly predict future behaviour. Robbins (2006) described that favourable attitudes among a work group will results in productive outcome (13).

In the present study majority had favourable attitudes. This indicates that HCWM when initiated would provide productive outcomes in both health care institutions included in the survey.

In this study practices of selected aspects were assessed and it was found that a majority reported correct practice. The ideal technique to assess practices would be through observations (9). However, in this study assessment of practices was through self report due to logistics difficulties conducting interviews. The possibility of overestimates by the respondents should be considered.

According to the evaluation through the checklist both hospitals lacked waste management plans and waste management committee which are essential to initiate a HCWM process in the institution. Regarding waste segregation, storage and transport most of aspects did not meet the required standard in all wards or was not practiced at all. Incineration and autoclaving the most efficient way of final treatment of waste and infectious waste were not available within both institutions and method used were not recommended under national guidelines. These findings need to be considered in implementing HCWM projects in these institutions.

Conclusions and Recommendations

All aspects of HCWM in both hospitals need much improvement. Processes related to HCWM need to be regularized. Both institutions need provision of essential facilities. Knowledge gaps among nursing officers need to be bridged by educational programmes. Educational programmes need to focus on technical details specific to HCWM. Mechanisms to sustain the favourable attitudes and correct practices related to HCWM needs to be adopted.

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