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Original Research Article

Knowledge, attitude and practices of health care staff regarding hospital waste handling in tertiary care hospitals of Muzaffarabad, AJK, Pakistan

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ABSTRACT

Background: Hospital waste management means the management of waste produced in hospitals by using different techniques that will prevent the spread of diseases. Hospital is the place where infectious and non-infectious healthcare waste is being generated and this needs a special precaution for its proper disposal. However, its mismanagement has posed major environmental threats and is now being reported as a serious public health issue worldwide. In developing countries, knowledge, attitude and practices regarding hospital waste management in terms of its segregation, collection, storage, transportation and disposal is limited.
Methods: A cross sectional study using simple convenient sampling was conducted from January to May 2015 at tertiary care hospitals of Muzaffarabad, AJK. A self-designed pretested questionnaire was used. Sample size was 114.
Results: Mean age of these participants was of 33 years (min 25-maz 41 years) and average work experience was 7 years. Among them, n67 (58%) were male and n47 (42%) were female. n13 (11.4%) were doctors, n68 (60%) were of paramedical staff and n33 (29%) were junior staff. The overall Satisfactory knowledge and attitude score (≥60% answers correct) of doctors was significantly higher than others. Knowledge about the color coding for specific wastes were insignificantly higher among doctors, rather only n4 (30.7%) doctors responded to this question. The overall Satisfactory practice score (≥60% answers correct) of junior staff was higher (94%).
Conclusions: Qualified medical professionals give little importance for hospital waste handling practices evident from lower practice score than the paramedical and lower staff. An important opportunity of possible oversight for hospital waste handling is missed in day to day hospital operation.

Keywords: Hospital waste management, Healthcare waste, Knowledge, Attitude and practices

INTRODUCTION

Hospital waste management means the management of waste produced by hospitals using techniques that will check the spread of diseases.[1] Hospital is the place where infectious and non-infectious healthcare waste is being generated due to the provision of medical care services to the patients. This waste needs a special attention for their proper disposal. However, improper waste management has posed major environmental threats and is now being reported as a serious public health issue worldwide.[2] In developing countries, knowledge, attitude and practices regarding hospital waste management in terms of its segregation, collection, storage, transportation and disposal is lacking.[3-6] Studies in Pakistan show that around 2.0 kg of waste/bed/day is produced out of which 0.1- 0.5 kg can be categorized as risk waste.[7] Regarding medical waste, there is a need for the health care workers to understand what actually it means. Hospital waste refers to all waste either biological or non-biological that

is once discarded than there is no need for further use in a hospital.

The hazardous nature of medical wastes is due to infectious agents, toxic or hazardous chemicals, pharmaceuticals, sharps, genotoxic and radioactive. [8] WHO estimated that, in 2000, injections with contaminated syringes caused 21 million hepatitis B, 2 million hepatitis C and 260,000 HIV infections.[9] So infectious medical wastes, particularly sharp ones, have been responsible for most of the accidents.

In developing countries, there is lack of the implementation of formal and informal community environmental education awareness program, The problem of waste management has become the main issue.[10] The concern regarding the medical waste is mainly due to pathogenic organisms and organic substances in hospital solid wastes in significantly higher concentrations and such higher number of organisms of human origin in solid waste suggests the presence of virulent strains of viruses and pathogenic bacteria in undetected numbers. Therefore, its improper handling increases the airborne pathogenic bacteria, which adversely affects the hospital environment and community at large. Apart from polluting water, air & soil, it has considerable impact on human health due to aesthetic effects.[11] After all it is the only man behind all this and that.

Most populated countries like Pakistan, India, Afghanistan, China, Nigeria and Bangladesh facing the improper infectious waste management practices in the hospitals that result in life threatening challenges.[12] In Pakistan, there is lack of knowledge related to infectious healthcare waste management. And even, not a single interventional study has been conducted in the past. The literature is also not supported regarding the practice of health workers in government sector hospitals. Though, a recent study reported the practices among the general practitioners who were working at their own clinics were not as per standard.[13]

Hence, this study has focused on the knowledge, attitude and practice (KAP) of health care staff regarding hospital waste handlings in tertiary care hospitals, Muzaffarabad.

METHODS

This was a cross sectional study using simple convenient method conducted from January to March 2015 tertiary care hospitals Muzaffarabad, AJK. The present KAP study enrolled 114 respondents, representing doctors, residents, nurses and paramedical from all departments of hospital. These respondents were categories into doctors, paramedical and junior staff. Doctors include consultants, residents, medical officers, post graduate trainee. Paramedical staff consists of nurses, technicians, pharmacist, lab attendants and operation theatre staff. And junior staff comprises office boys, ayah, cafeteria workers, sanitary workers, guards, gardeners and receptionist. Total 236 structured pretested questionnaires, were distributed. We recieved 124 feed-backs out of total 236. The study assessed knowledge, attitudes and practices of health-care providers towards waste management. Patients, their visitors and illiterate workers were excluded from study. Hospital staff was interviewed using a self-designed questionnaire. Before it was used, the questionnaire was pretested in the pilot study. The questionnaire consisted of four parts comprising 38 questions and information collected through questionnaire included (1) General information on respondents including age, education, job designation, work experience and marriage status etc. (2) knowledge regarding waste management (3) attitude and (4) practices regarding waste management. The responses on attitude were classified into very important, important and not important. Informed written consent was taken from all respondents prior to data collection. They were assured for maintaining their privileges and anonymity. The study was approved by ethical review board of aforementioned hospital. After collecting data, data were edited and analysed by SPSS- software (version 21). 't' test and correlation tests were used according to the objective of this study. Descriptive statistics i.e. percentage, mean and standard deviation was used to describe categorical variables. Original patient's data were filed and was locked by principle author.

RESULTS

Total 236 questionnaires were distributed among doctors, paramedical staff and junior staff of tertiary care hospitals, Sheikh Khalifa Bin Zayed hospital, (SKBZ/CMH) and Abbas Institute of Medical Science and Teaching hospital (AIMS) Muzaffarabad, AJK (Pakistan). Only 124 questionnaires were returned and among them 10 questionnaires were incompletely filled for more than 5 questions so they were discarded. 114 participants with mean age of 33 years (min 25-max 41 years) data were analysed. Among them, n67 (58%) were male and n47 (42%) were female. n13 (11.4%) were doctors, n68 (60%) were of paramedical staff and n33 (29% were junior staff (Figure 1). The average work experience of theses participants was 7 years (Table 1).

The upper and lower level of 95% confidence interval of the difference for knowledge item was 7.7309 and 6.9709 respectively. Mean value was 7.3509, median 7.5000 and standard deviation was 2.048

Simple t-test is 38.323. The overall Satisfactory knowledge score (≥60% items correct) of doctors was significantly higher than others (Table 2). Knowledge about the colour coding for specific wastes were insignificantly higher among doctors, rather only n4 (30.7%) doctors responded to this question (Figure 1).

The upper and lower level of 95% Confidence interval of the difference for Practice item was 3.2984 and 7.2457

respectively. Mean value was, 3.1140 median 3.0000 and standard deviation was 0.99343

Simple t-test resulted in 33.469. The overall Satisfactory practice score (≥60% items correct) of junior staff was higher (94%) than other (Table 4).

Table 1: Characteristics of the study participants.

S. No	Variable	Doctors (n=13)	Paramedical staff (n=68)	Junior staff (n=33)	Total
a	Age (years)				
	<25	2 (15)	32 (47)	19 (57)	53 (46)
	26-40	9 (70)	24 (35)	10 (30)	41 (36)
	>40	2 (15)	12 (18)	04 (12)	18 (16)
b	Sex (no %)				
	Male	08 (61)	41 (60)	18 (54)	67 (56)
	Female	05 (39)	27 (40)	15 (46)	47 (41)
c	Marriage status				
	Married	05 (38)	16 (23)	17 (51)	38 (33)
	Unmarried	08 (62)	52 (77)	12 (36)	72 (63)
	Divorced	0 (0)	0 (0)	4 (13)	4 (3)
d	Work Experience				
	<5	08 (61)	38 (56)	17 (51)	63 (55)
	6-10	04 (30)	15 (22)	08 (24)	27 (21)
	11-15	0 (0)	04 (6)	06 (18)	10 (8)
	>16	01 (9)	11 (16)	02 (6)	14 (12)

Table 2: Knowledge of health-care workers in different jobs about aspects of waste disposal at the hospital.

S. No	Knowledge item (Items correctly answered)	Doctors (n=13)	Paramedical staff (n=68)	Junior staff (n=33)	P value
		No (%)	No (%)	No (%)	
01	Is it important to properly dispose of the health care waste?	13 (100)	68 (100)	33 (100)	**
02	Does your health care setting has a waste management plan?	12 (92)	59 (86)	25 (75)	0.253
03	Does your hospital has a Waste Management Team?	12 (92)	56 (82)	29 (88)	0.774
04	Are there clearly defined procedures for collection and handling of wastes from specified units in the hospital?	12 (92)	57 (83)	28 (84)	0.733
05	Should waste be segregated into different categories?	11 (84)	58 (85)	25 (76)	0.486
06	Do you code the waste for disposal?	09 (69)	55 (80)	16 (48)	0.004
07	Is the infection waste labelled with the Bio-Hazard Symbol?	10 (76)	49 (72)	17 (51)	0.086
08	Do your hospital maintain a register for waste disposal	08 (61)	30 (44)	10 (30)	0.134
09	Has your healthcare setting done a waste audit in last three years?	07 (53)	31 (45)	12 (36)	0.273
10	Would you like to attend a training program on hospital waste management	11 (84)	54 (79)	32 (97)	0.067
12	Tick the facilities available for Waste Management.				
	Segregation	03 (23)	10 (14)	12 (36)	0.010
	Containment	0 (0)	05 (7)	03 (9)	
	Burial	01 (7)	07 (10)	06 (18)	
	Burning	03 (23)	01 (1)	0 (0)	
	Incineration	0 (0)	05 (7)	0 (0)	
	Autoclave	01 (7)	13 (2)	07 (21)	
	More than one.	05 (38)	25 (36)	05 (15)	
Satisfactory knowledge score (≥60% items correct)		92%	84%	72.7%	
Mean value		8.3846	7.8462	3.3077	
St. dev		1.70970	0.98710	1.10940	
t-test		17.7	28.7	10.8	

Table 3: Attitudes of health-care workers in different jobs towards waste disposal at the hospital.

S. No	Attitudes item (Items correctly answered)	Physicians (n=13)	Paramedical staff (n=68)	Junior staff (n=33)	P value
		No (%)	No (%)	No (%)	
01	Safe management of health care waste is not an issue at all.	02 (15)	16 (23)	02 (6)	0.268
02	Safe management of health care waste is the responsibility of government	10 (77)	47 (69)	20 (60)	0.926
03	Waste management is team work / no single class of people is responsible for safe management.	11 (85)	53 (78)	26 (79)	0.923
04	Safe waste management efforts by hospital increases financial burden on management?	07 (53)	36 (53)	12 (36)	0.423
05	How do you rate the importance of information for health care waste handling?	10 (77)	48 (70)	27 (82)	0.468
06	In your opinion, it is necessary that the health care workers should be properly protected from getting sick by the infectious waste during their handlings?	12 (92)	60 (88)	28 (85)	0.770
07	Will you recommend the use of color coded bin for waste collection?	13 (100)	62 (91)	22 (67)	0.004
08	Up to what extent do you feel that you are responsible for health care waste management?	08 (61)	36 (53)	19 (58)	0.014
09	To what extent it is necessary that health care wastes should be properly handled?	11 (85)	58 (85)	22 (67)	0.064 ()
10.	What is the schedule for collection of waste				0.614 ()
	Daily	10 (77)	62 (91)	29 (88)	
	twice a week	01 (8)	03 (4)	02 (6)	
	Weekly	02 (15)	03 (4)	02 (6)	
	Satisfactory attitudes score (≥60% items correct)	100%	98%	94%	
	Mean	7.4706	7.2941	2.8771	
	St.dev	2.01094	1.00831	1.09462	
	t-test.	30.6	59.7	21.8	

Table 4: Observed practice in waste disposal at the hospital among physicians and nurses: percentage of respondents correctly performing practice items.

S. No	practice item (Items correctly answered)	Physicians (n=13)	Paramedical staff (n=68)	Junior staff (n=33)	P value
		No (%)	No (%)	No (%)	
01	Does infection, non-infections, sharps and others waste are stored separately?	07 (54)	50 (73)	23 (70)	0.363
02	Is there any storage facility for collected waste?	10 (30)	57 (84)	27 (82)	0.830
03	Does the occupational safety measures are observed?	13 (39)	53 (78)	27 (82)	0.409
04	Are the specific things-used for collection of waste is color coded?	10 (30)	40 (59)	18 (55)	0.370
05	What safety measures are undertaken during collection of wastes?				0.422
	face mask	02 (15)	10 (15)	07 (21)	
	Apron	0 (0)	01 (1)	0 (0)	
	Leg protectors	0 (0)	02 (3)	0 (0)	
	Gloves	03 (23)	05 (7)	04 (12)	
	Face mask/ gloves	03 (23)	30 (44)	13 (39)	
	Face mask/apron/gloves/eye protector	04 (30)	12 (17)	02 (6)	
	All	01 (7)	08 (11)	07 (21)	
	Satisfactory practice score (≥60% items correct)	92%	60%	94%	
	Mean	6.5217	7.7391	3.4783	
	St.dev	2.08609	1.09617	0.51075	
	t-test	15.0	33.9	32.7	

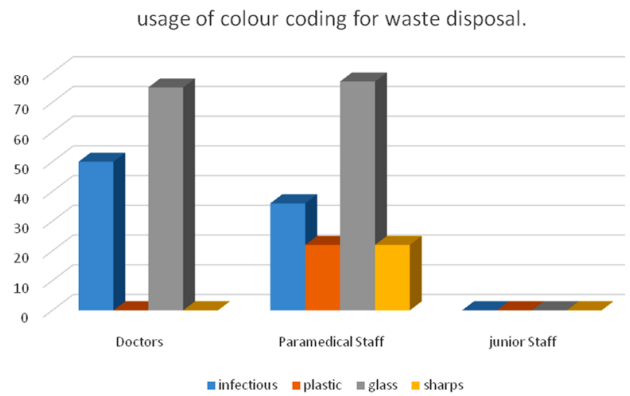

Figure 1: Percentage of different health care staff using colour coded bins for different types of hospital wastes.

The upper and lower level of 95% Confidence interval of the difference for practice item was 7.6315 and 7.2457 respectively. Mean value was 7.4386, median 7.0000 and standard deviation was 1.03936.

Simple t-test 76.415 show a higher significance difference. Like knowledge, the overall satisfactory attitudes score (≥60% items correct) of doctors (100%) was highest.

DISCUSSION

The generator/incinerator of a hospital is responsible for ensuring proper disposal. Hospitals are ethically obliged to maintain a clean environment and proper handling of wastes in order to prevent pollution and infection within and near the hospital.[14-16] A pivotal aim of this study is to give us a unique opportunity to provide information about a KAP related to hospital waste management which is lacking in our country, as we have only found one study in the literature addressing the same objective. [17]

In the current study, it was found that the hospitals had well documented waste management plans as well as proper waste management team.

It was also found that knowledge about the clearly defined procedures for collection and handling of wastes from specified units in the hospital was significantly better among doctors (92%) than paramedical staff (83%) and junior staff (84%). Similar, knowledge of doctors (92%) about existence of waste management plan was also greater than paramedical and junior staff. On the other hand, doctors, doctors were less knowledgeable about practical aspects of biomedical waste management (92%) than junior staff (94%) This is in accordance to a study from India, which found that knowledge of the existence of biomedical waste management plan was better among doctors than nurses or paramedical staff, but the knowledge of the practical aspects of biomedical waste management was better among other than doctors.[18] In this study, knowledge regarding color coding for waste was higher among paramedical staff (80%) than doctors (69%) which is in accordance with a study done in Bangalore, India.[19]

Our findings showed that, overall, the percentage of doctors with satisfactory Knowledge scores regarding waste management (92%) was significantly higher than that of paramedical (64%) and junior staff (72%). A cross-sectional study at Al-Mansoura University Hospital in Egypt showed that 36.8% of doctors, 32.1% of housekeepers and 27.4% of nurses had satisfactory overall knowledge related to waste management.[20]

Regarding the attitude of healthcare workers towards waste disposal at our hospital, it was found that, overall; more doctors had satisfactory attitude scores (100%) than paramedical (98%) and junior staff (94%), although the differences were not significant.

Doctors were more likely than other workers to agreed that safe disposal is of utmost importance to prevent infection transmission and that wearing personal protective equipment reduces the risk of contracting infection. Similar to a tertiary health-care center in India, a positive attitude towards the need for measures for safe collection and final disposal of biomedical waste was higher among doctors (100%) than nurses (60%).[21]

On the other hand, for some questions like safe management of health care waste is not an issue at all, waste management is team work/no single class of people is responsible for safe management., and that safe waste management efforts by hospital increases financial burden on management —the proportion of junior staff showing approval of these items was significantly higher than that of doctors and paramedical staff. This is exactly in consistence with a study done in a tertiary care rural hospital in India, in which the majority of the sanitary staff (junior staff) felt that the management of biomedical waste was not an issue at all and was purely the responsibility of the institution not an individual responsibility. They also felt that the safe management of waste was an extra burden at work.[22]

We found that the practice scores of junior staff were significantly higher than those of paramedical staff and doctors (94% versus 60% and 92% respectively). This may be attributable to their lack of training, as fewer doctors and paramedical staff in our study wished to receive training on proper waste management at the hospital than did junior staff (97)% versus 84% and 79% respectively). This is in agreement with a previous report showing that improper waste management was influenced more by the ignorance of local health personnel. [23] Egyptian studies revealed that 18.9% of the nurses and none of the doctors had adequate waste management practices.[20] In contrast to this study, it was found that nurses in Bangalore practiced biomedical waste management significantly better than the technical and housekeeping staff.[19] The findings of an Indian study

revealed that 45.4% of nurses versus only 25.8% of technicians were practicing the biomedical waste management rules.[24]

The association between duration of work experience and KAP scores among different job categories in the current study was not significant, except for the relationship between work duration and practice of waste management among paramedical staff; majority of staff 16% had work experience >16 years and their overall practice score was less (60%) than doctors (92%) and junior workers (94%). This is in consistence with a study done in Cairo, Egypt.[25]

Qualified medical professionals give little importance for hospital waste handling practices evident from lower practice score than the paramedical and lower staff. An important opportunity of possible oversight for hospital waste handling is missed in day to day hospital operation. Nurses have better understanding and are more responsible in the implementation. Paramedical staff has less understanding but better practical application of various aspects. Intensive training and orientation programs at regular time interval for all the staff with special importance to the new comers are highly recommended. Regulatory framework for hospital waste management also need to be strengthened with regular monitoring and evaluation to avoid public health hazards.

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