ORIGINAL ARTICLE

KNOWLEDGE, ATTITUDE AND PRACTICES OF HEALTH STAFF REGARDING INFECTIOUS WASTE HANDLING OF TERTIARY CARE HEALTH FACILITIES AT METROPOLITAN CITY OF PAKISTAN

Ramesh Kumar, Ratana Samrongthong*, Babar Tasneem Shaikh**

College of Public Health Sciences, Chulalongkorn University Thailand, and Department of Health System and Policy, Health Services Academy, Government of Pakistan Islamabad, *College of Public Health Sciences, Chulalongkorn University Thailand, **Department of Health System and Policy, Health Services Academy, Government of Pakistan Islamabad

Background: Health Care Waste (HCW) is considered as the second dangerous waste in the World that needs to be properly disposed by trained health care staff. Good knowledge, positive attitude and safe practices of medical staff is very imperative while managing this infectious waste. This assessment has been conducted to determine the situation and KAP of infectious waste management in health care workers working at tertiary care settings health facilities of Rawalpindi, Pakistan. **Methods:** This study was part of an ongoing quasi-experimental with control and intervention design and was conducted in tertiary care governmental hospitals of Rawalpindi by interviewing healthcare workers (HCWs) who were selected randomly after the sample size calculation. The participants were selected according to the proportional size of the each HCWs for their equal representation from all the groups. Self-administered valid and reliable questionnaire were adapted after taking the written consent. Ethical consideration was taken from ethical committee of Health Services Academy Pakistan. **Results:** Total 275 HCWs including doctors, nurses, paramedics and sanitary workers were interviewed during this baseline survey. The mean age of the health workers were 30±5 years. Infectious waste management practices with in both hospitals were not found statistically significant (p=0.33). However, the socio-demographic information like age, gender, level of education and experience, when compared with the practices were found statistically significant (p<0.05). Doctors and nurses have better knowledge, positive attitude and good practices compare to paramedics and sanitary staff regarding infectious waste management and was found statistically significant (p<0.05). **Conclusions:** Practices among HCWs were not found up to the standards in these tertiary care hospitals of Pakistan and were not following the proper guidelines and WHO rules.

Keywords: Health Care Workers, Waste Management, Infectious Waste, KAP, Assessment

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INTRODUCTION

Hospital is the place where infectious healthcare waste is being generated due to the provision of medical care services to the patients. This infectious waste needs a special attention for their proper disposal. However, improper infectious waste management has posed major environmental threats and is now being reported as a serious public health issue worldwide.[1] Infectious Health care waste is composed of the materials that are produced from medical treatment in the medical units such as offices of general practitioner and dental clinics, chiropractors, acupuncture, at home patient care, from harm reduction programs for drug addicts, maternity homes, diagnostics laboratories, immunization and scientific research.[2] Mismanagement of infectious waste results in environmental pollution and unpleasant odours due to harmful pathogens that may develop many infections such as typhoid, cholera, tuberculosis and other diseases namely; Hepatitis and HIV/ AIDS.[3] Although, the quantity of infectious waste produced is less as compared to the overall health care waste, but the poor waste management practices by health care workers mix this waste with non-infectious waste and contaminate whole lot as infectious waste.[4] Health workers, patients, waste handlers, waste pickers and general masses are prone to develop these infections. Hence this is an urgent need to have all kinds of wastes be treated properly. Health Care Waste (HCW) is the second dangerous waste in the World that needs to be properly disposed by trained health care staff. Knowledge and safe practices of medical staff is very imperative while managing this waste. Recycling and reuse of the syringes is one of the serious public health problem reported globally, resulting in potential threats to the general public. The main threat is needle prick injuries especially among the Health Care Workers who are handling the waste.[5] It has been reported that the health care waste generation rate ranges from 0.5 to 2.0 kg per bed per day globally.[6] **A**pproximately 1.35 kg/bed/day of waste is produced on average in the Pakistani hospitals which produce about 250000 tons of HCW per year. HCW comprises of 15–20% of general waste but due to improper segregation by hospital staff resulting in contamination of general waste that emerges of many infectious diseases and other environmental hazards if not disposed properly.[7] General waste

disposal mechanism in communities has not been of standards and is subject to many scavengers who collect items such as papers and cause spread of the many components of the trash within the surrounding atmosphere and risking the health of the communities. Hence, Hospitals which do not have comprehensive mechanism for waste disposal within their own system such as lack of incineration can lead to open dumping of human organ waste in the communities.[8]

Most populous countries like Pakistan, India, China, Nigeria and Bangladesh facing the improper infectious waste management practices in the hospitals that result in occupational and public health challenges for the general masses.[9]

In Pakistan, there is lack of information related to infectious healthcare waste management. However, not a single interventional study has been conducted in the past and also literature is not supported regarding the practices of health workers, who are the responsible for management of waste in any health care organization. Though, a recent study reported the practices among the general practitioners who were working at their own clinics were not as per standard.[10] Hence, this study has focused on the Knowledge, attitude and Practices among all health workers working at tertiary care hospitals of Rawalpindi.

METHODS

The data presented here is the part of an ongoing study that is conducted to determine the situation of healthcare waste management among health care workers working at tertiary care settings healthcare facilities of Pakistan. This baseline has been conducted within the month of September 2013 before to start of the intervention. Quasi-experimental with control and intervention design was conducted in tertiary care governmental hospitals of Rawalpindi Pakistan. Total 275 from a population of doctors, nurses, paramedics and sanitary workers who were involved in the management of HCW were selected randomly; after the sample size calculation with 80% power, alpha error of 0.05, at the difference of 0.2 and 0.5 was the assumption in improvement of practices after intervention. Health care workers including doctors, nurses, paramedics and sanitary workers were selected from both intervention and control hospitals. There were about 3,000–3,500 health care workers are working in each tertiary care hospital of Rawalpindi; the proportion of doctors were 25%, nurses 35%, paramedics 30%, and sanitary workers 10%. The sample size was selected according to the proportional size of the each HCW after sample size calculation for their equal representation from all the healthcare workers groups. HCWs were interviewed from all the departments of both control and intervention hospitals were included while, new hired staff, students and workers on long leave were excluded from this study. World Health Organization (WHO) self administered questionnaire, checklist and direct observations were adapted after piloted, pretested, translated and used after taking the written consent.[11] Questionnaires were distributed among HCWs and asked them to fill while; face to face interview was conducted for the sanitary workers by using the structured questionnaire, which was interpreted by the researcher in local language because most of them cannot read English. The content validity was obtained through the expert advice in the field from professors at Chulalongkorn Thailand and Health Services Academy Pakistan. The reliability of the questionnaire was obtained through pre-test and piloting on 30 HCWs working in the hospital located adjacent district with similar health facilities. Cronbachs's alpha coefficient was used to calculate the reliability of the questionnaire used for knowledge of respondents. Institutional ethical approval was taken from the Board of Ethical Committee of Health Services Academy Pakistan. Descriptive statistics including numbers, percentages, mean and CI were calculated from the baseline data. Paired simple *t* test was used to analyze the difference between assessments of practices of infectious waste management within both groups.

RESULTS

Majority of respondents were nursing staff (31%), followed by doctors (29%), paramedics (21%) and sanitary workers (19%). Demographic information showed that most 75% of the participants were male. The mean age of the respondents were 30±4 years, while the minimum age of the participants in the study was found to be less than 25 years who accounted for 45% of the total sample while 33% of the participants were of age above 35 years. Above one third of HCWs had qualification of graduation, 25% had secondary education that is 15 years of education while only 9% had postgraduate qualification (Table-1). When we compared the practices with in both hospitals, the situation were almost same and found statistically non significant (p=0.33). However, the socio-demographic information like age, gender, level of education and experience, when compared with the practices were found statistically significant with p-value <0.05.

Data analysis shows that the doctors and nurses have better knowledge than paramedics and sanitary workers about infectious waste management. Mostly (48%) doctors were aware about the segregation of infectious waste at source as per the WHO guidelines, while this knowledge were found poor in sanitary workers and paramedics. Regarding collection of infectious waste from different areas of the hospital, (63%) doctors had better knowledge as compared to other groups and were found statistically significant. Majority of the doctors (65%) and nursing staff (60%) had good attitude regarding the waste throw in the

proper waste bin at their working area as compare to sanitary workers and paramedics. When asked about the collection of waste bins, once it filled was found statistically significant in doctors and nurses. Practices of using the waste colour coding and segregation of waste were poorly recorded except doctors and nurses they were also not practicing as per the WHO standards. Regarding occupational hazardous due to improper waste management and protocols of infectious disease control were better known to all the doctors and nurses. Paramedical staff and sanitary workers were found to be less knowledgeable and their practices regarding HCW management was found low as compared to doctors and nursing staff. (Table-2)

Table-1: Socio-demographic characteristics of healthcare workers (n=275)

Socio-demographic characteristics		Respondents							
		Doctors (n= 80)		Nurses (n=86)		Paramedics (n= 56)		Sanitary Workers (n=53)	
		N	%	N	%	N	%	N	%
Age	<25	52	65	44	51	22	39	5	9
	26–35	14	17	18	21	18	32	12	23
	>36	14	18	24	28	16	29	36	68
Gender	Male	60	75	9	10	51	91	35	66
	Female	20	25	77	90	5	9	18	34
Educational status	Postgraduation	16	20	7	8	-	-	-	-
	Graduation	64	80	31	36	4	7	-	-
	Secondary	-	-	48	56	50	98	48	91
	Primary	-	-	-	-	2	4	5	9
Hospital	Holy Family	41	51	43	50	28	50	26	49
	District Headquarter	39	49	43	50	28	50	27	51
Income	<10,000	-	-	8	9	11	20	53	100
	10–20 K	2	2	27	32	45	80	-	-
	>20,000	78	98	51	59	-	-	-	-
Department	Medicine & Paediatrics	40	50	24	28	23	41	13	25
	Surgery & Gynaecology	25	31	34	39	11	20	21	39
	Emergency & Operation Theatre	13	17	24	28	19	34	15	29
	Administration	2	2	4	5	3	5	4	7
Experience	<5 years	54	67	28	32	7	13	12	23
	5–10	19	24	27	32	37	66	14	26
	>10 years	7	9	31	36	12	21	27	51

Table-2: KAP about infectious waste management among HCWs (n=275)

Variables		Doctors (n=80) [n (%)]	Nurses (n=86) [n (%)]	Paramedics (n= 56) [n (%)]	Sanitary Workers (n=53) [n (%)]	*p*
Knowledge	Segregation of infectious waste	48 (60)	45 (52)	20 (36)	18 (34)	0.00
	Collection of infectious waste	50 (63)	48 (56)	18 (32)	15 (28)	
	Transportation of infectious waste	49 (61)	45 (52)	15 (27)	12 (23)	
	Disposal of infectious waste	51 (64)	48 (56)	18 (32)	16 (30)	
Attitude	Throw waste in wrong bin	52 (65)	50 (60)	21 (38)	18 (34)	0.03
	Collection of waste bins	50 (63)	48 (56)	18 (32)	15 (28)	
	Infectious waste transport	54 (68)	50 (60)	19 (34)	17 (32)	
	Infectious waste responsibility	55 (69)	52 (62)	15 (27)	12 (23)	
Practices	Use proper color coding	40 (50)	42 (50)	21 (38)	17 (32)	0.01
	Use of Personal Protective Equipments	30 (38)	31(37)	10 (18)	8 (15)	
	Waste collection after every 24 hours	25 (31)	30 (36)	12 (21)	10 (19)	
	Disposal of sharps	28 (35)	24 (29)	14 (25)	12 (23)	

DISCUSSION

Knowledge on infectious waste management among the qualified health workers like the medical doctors and nurses was more as compare to the sanitary workers and paramedics; these findings have been supported by other similar kind of studies.[12] This difference is due to many factors like the level of education, working experience, training and their practical involvement in the hospital waste handling.[13] Similarly the knowledge about colour coding during infectious waste management was found low in the lower staff. These findings were also supported by the similar study.[14] It was noted that the practices regarding infectious waste management of HCWs were found very poor. Many of the health care workers were deficient in practicing the proper waste colour coding and the use of personal protective equipments (PPE). Practices could only be improved by proper trainings and by allocating the proper budget for concerned staff.[15] Educational background is an important factor while in improving the practices of an individual regarding infectious health care waste management[16] Practices can be improved with proper regular trainings for HCWs in any organization.[7]

Practices of infectious waste management was found poor in all the respondents, though it was found better in some extent among doctors and nurses but not up to the standard. Study also supports that HCWs were not properly following the legislation available with government of Ethiopia results in improper waste management had been reported in various hospitals.[17] The study showed that HCWs need specific information on the management of infectious waste, in particular on the segregation and its disposal. They were also not clear about the basic definition of risk management.[18] Infectious waste management practices of healthcare staff were related to the complexity of the proper segregation of wastes and the lack of knowledge concerning the importance of that sorting. The risk of infection with poor practice were also reported high at the time of patient handling, and the frequency of needle pick injuries were related to the daily tasks of each healthcare group (doctors, nurses, and housekeepers). Moreover, proper guidelines and legislations regarding the healthcare wastes have an important role in the management practices among health staff.[19]

CONCLUSION

Practices among HCWs were not found up to the standards in these tertiary care hospitals of Pakistan and were not following the proper guidelines and WHO rules. However, knowledge and attitude among doctors and nurses were found more as compare to paramedics and sanitary staff and also found statistically significant. There are no significant differences found regarding the infectious waste management practices of HCWs in both tertiary care hospitals. It is recommended that continuous training should be given for the proper improvement of their practices among HCWs.

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Address for Corresponding:

Dr. Ratana Samrongthong, Associate Professor, College of Public Health Sciences, Chulalongkorn University Thailand.

Email: ratana.so@chula.ac.th, sratana3so@gmail.com