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RISKS ASSOCIATED WITH COMPLIANCE IN MEDICAL WASTE PRACTICES AMONG HEALTH WORKERS AT KENYATTA NATIONAL HOSPITAL

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Abstract

Purpose: This research was done to establish the risks associated with compliance in medical waste practices among health workers at Kenyatta National Hospital.

Methods: This study adopted a descriptive research design. The study population comprised of health workers at KNH, who are directly involved in medical waste management practices and met the inclusion criteria of the study. The composition included Doctors, Nurses, Laboratory technologists, and Support staff who add up to 1000, of which a representative sample was drawn statistically. Stratified proportionate sampling was used to select desired sample size of 297 respondents. The self-administered questionnaires and a developed checklist were used. Data was organized, cleaned, coded and evaluated for accurateness in preparation for analysis using the R 3.6.0 statistical program. Descriptive statistics were done by calculating proportions, percentages, measures of central tendency, dispersion and performing cross-tabulations, to compute demographic. Inferential statistics using chi-square was done to assess significant associations between dependent and independent variables. The results are presented in terms of tables, graphs, and pie-charts.

Results: The findings indicated that the association between segregation compliance of medical waste and socio-demographic showed that there was statistically significant association between years of working and segregation of medical waste generated. The level of compliance between department and the level of emptying was assessed and the results showed that there was no significant association between emptying level compliance and department.

Unique Contribution to Theory, Practice and Policy: From the findings, the study recommeded that there was need to Train staff on medical waste management practices which will provide a strong system that can help improve compliance in segregation, safety measures and risk mitigation.

Key Words: *Risks Compliance, Medical Waste Practices, Kenyatta National Hospital*

1.0 INTRODUCTION

All individuals exposed to hazardous MW are potentially at risk including those within the health establishment that generate these wastes and those outside these sources, who either handle such waste or exposed to it as a consequence of non compliance. The main groups at risk are medical doctors, nurses, subordinate staff and hospital maintenance personnel, patients in a health establishment, visitors, workers in areas such as laundries, waste handling, transportation and also in waste treatment facilities including scavengers and totters (Hossain *et al.*, 2013).

The scavengers have professionalized unauthorized recycling of waste material from dumps and this act puts them at risk from sharp objects, pharmaceuticals and chemicals and by coming into direct contact with infectious materials. Recycling of infectious objects poses a serious health hazard to users. Scavengers engaged in recycling mostly are extremely poor, ill-educated and unaware of the harmful consequences of exposure to contaminated and hazardous waste. They evidently suffer injuries from sharps and broken glass among other things, as well as suffering from intestinal parasitosis, skin disease, diarrhea, chronic dysentery, and viral hepatitis (Hossain *et al.*, 2011).

In Tanzania, Shinyanga municipality, MW is disposed of in the open community bin along with the normal waste which is commonly scavenged by boys/girls without any precaution which might cause health hazards and infectious disease (Kuchibanda& Mayo, 2015). A cross-sectional study carried out in Namibia on knowledge, attitude and practice among the health workers revealed that they must be educated on the risk in order to improve their practices with regard to MW management since they are required to carry out the expanded role in a variety of settings. They have to be ecologically sensitive in assessing the impact of their practices on the environment and how to provide ways to reduce the hazards (Manchanda *et al.*, 2015).

A three-year study carried out in Jordan found out that in 1000 people involved in patient-related activities, 248 health workers had needle prick injuries of which 43.1% were nurses, 19.1% were environmental workers, 15.7% were interns, 11.7% were residents and 6.0% were technicians. The study concluded with an association in management compliance of needle-stick injuries occur frequently to nurses, physicians, technicians and support staff in developing countries (Patwary *et al.*, 2011).

1.1 Statement problem

Effective management of medical waste has been a major challenge globally considering the existing diverse guidelines that health facilities employ. Waste management entails effective medical waste management generation, segregation, collection, and treatment. Inability to understand the underlying waste management protocol leads to the development of major risks. Globally injuries associated from needle pricks, patients body fluids have been confirmed to cause 1.7m (45%) cases of Hepatitis B and C viruses,400,000 (9%) new HIV infections, 10million annual TB infections with estimated 3 million cases among health workers in the hospitals and from home based care givers due to mishandling of medical waste(WHO,2017).

Recognizing the magnitude of this problem many developing countries in the Continent of Africa and the sub- Saharan have responded through the establishment of regulatory frame works, polices and medical waste plans but still greater challenge of under funding towards

management of medical waste has exposed health workers on hospital acquired infections and polluting the environment (CDC,2015).

A third of public hospitals and a fifth of private ones in Kenya do not manage their medical waste in a safe recommended way leading to health risks in both health workers and the population that makes a living through scavenging along the waste stream (GOK,2018). Taking into account that KNH is the largest National referral hospital in Kenya with over 2000 bed capacity and over 1000 outpatient clients seeking health services per day leading to the generation of 2 tones of medical waste per day(KNH,2017). Hence there is a need for medical waste management to minimize the associated risks, thus the study sought to determine medical waste management practices among health workers at Kenyatta National hospital.

2.0 METHODOLOGY

This study adopted a descriptive research design. The study population comprised of health workers at KNH, who are directly involved in medical waste management practices and met the inclusion criteria of the study. The composition included Doctors, Nurses, Laboratory technologists, and Support staff who add up to 1000, of which a representative sample was drawn statistically. Stratified proportionate sampling was used to select desired sample size of 297 respondents. The self-administered questionnaires and a developed checklist were used. Data was organized, cleaned, coded and evaluated for accurateness in preparation for analysis using the R 3.6.0 statistical program. Descriptive statistics were done by calculating proportions, percentages, measures of central tendency, dispersion and performing cross-tabulations, to compute demographic. Inferential statistics using chi-square was done to assess significant associations between dependent and independent variables. Results are published and presented in various scientific forums. The results are presented in terms of tables, graphs, and pie-charts.

3.0 RESULTS

3.1 Social Demographics Characteristics

The analysis results showed that 52 %(n =140) were female while 48 %(n= 132) were male. The cadre of the respondents was also assessed, 53% (n= 144) were nurses, 21 %(n = 57) were support staff, 18 %(n= 50) were laboratory technicians while 8% (n = 21) were doctors. Departmental affiliation showed that 18% (n = 49) were from laboratory, 17% (n = 47) from reproductive health, 17% (n = 47) were from accident and emergency department, 13 %(n = 36) from peadiatrics.11 %(n= 30) from general surgery, 10% (n = 26) while 3% (n = 8) from incinerator. Period worked in the hospital showed that 38%(n =102) of the respondents had worked for a period between 5 and 10 years while 32% (n = 88) had worked in the hospital for a period between 10 and 15 years, 26% (n =70) worked between 1 and 5 years while 4% (n = 12) have worked in the hospital for a period of more than 15 years as shown in table 1.

Table 1: Respondents socio-demographic

	Frequency (n =272)	%
Sex		
Female	140	52
Male	132	48
Job cadre		
Nurse	144	53
Support staff	57	21
Laboratory technician	50	18
Doctor	21	8
Department		
Accident and Emergency	46	17
Laboratory	49	18
Reproductive health	47	17
Pediatrics	36	13
Orthopedics	30	11
General surgery	30	11
Medicine	26	10
Incinerator	8	3
Period worked at the hospital		
1 to 5 Years	70	26
5 to 10 Years	102	38
10 to 15 Years	88	32
Above 15 Years	12	4

3.2 Risks associated with compliance in medical waste practices among respondents

3.2.1 Association between socio-demographic and segregation compliance among respondents

The association between segregation compliance of medical waste and socio-demographic was performed where the findings showed that there was statistically significant association between years of working and segregation of medical waste generated, $X^2(3) = 43.25$, $p = 0.000$, $p<0.05$. Job cadre and department was not associated with segregation compliance, $p>0.05$ as shown in table 2.

Table 2: Chi-square test for association between socio-demographic and segregation compliance among respondents

		Use of the color-coding scheme to drop medical waste		X^2	P-value
		Correct code	Wrong code		
Job cadre	Doctor	33(67.3%)	16(32.7%)	2.78	0.426
	Nurse	277(63.4%)	81(22.6%)		
	Lab tech	100(76.3%)	31(23.7%)		
	Support staff	25(71.4%)	10(28.6%)		
Department	Accident and Emergency	75(72.8%)	28(27.2%)	5.828	0.56
	Lab tech	93(74.4%)	32(25.6%)		
	Reproductive health	74(74.7%)	25(25.3%)		
	Paediatrics	52(81.3%)	12(18.7%)		
	Orthopaedic	50(80.6%)	12(19.4%)		
	General Surgery	40(74.1%)	13(19.7%)		
	Medicine	53(80.3%)	13(19.7%)		
	Incinerator	8(100%)	0		
Years of working in hospital	1 - 5 years	62(88.6%)	8(11.4%)	43.25	0.000
	5 -10 years	72(70.6%)	30(29.4%)		
	10 -15 years	36(40.9%)	52(59.1%)		
	Above 15 years	10(83.3%)	2(16.7%)		

3.2.2 Association between medical waste collection schedule and department

Analysis of association between schedule for collecting medical waste and department was conducted where results showed that there was statistically significant association between department and schedule for collecting medical waste $X^2(7) = 31.043$, $p = 0.005$, $p<0.05$ as shown in table 3.

Table 3: Chi-Square test for association between medical waste collection schedule and department among respondents

		Schedule for collecting medical waste		X^2	P-value
		Available	Not available		
Department	Accident and Emergency	45 (90%)	5(10%)	5.828	0.005
	Orthopaedic	27(90%)	3(10%)		
	General surgery	29(96.7%)	1(3.3%)		
	Reproductive health	35(74.5%)	12(25.5%)		
	Paediatrics	32(91.4%)	3 (8.6%)		
	Incinerator	4(100%)	0		
	Laboratory	46(95.8%)	2 (4.2%)		
	Other	23 (92%)	2(8%)		

3.2.3 Association between compliance in level of emptying medical waste and the departments

The level of compliance between department and the level of emptying was assessed as shown in table 4. The results showed that there was no significant association between emptying level compliance and department, p-value >0.05.

Table 4: Chi-square test for association between compliance the level of emptying medical waste and departments

		Level of emptying of medical waste		X^2	P-value
		Below ¾ full	Above ¾ full		
Department/unit/ward	Accident and Emergency	9(81.8%)	2(18.2%)	4.214	0.648
	Laboratory	3(75%)	1(25%)		
	Reproductive health	8(88.9%)	1(11.1%)		
	Paediatrics	8(88.9%)	1(11.1%)		
	Orthopaedic	8(100%)	3 (8.6%)		
	Medicine	7(100%)	0		
	Incinerator	6(75%)	2(25%)		
	General Surgery	5(55.6%)	4(44.4%)		

3.2.4 Association between cadre and vaccination/treatment compliance while handling medical waste

Vaccination as a safety mechanism was analyzed based on respondent's department. The findings showed that there was statistically significant association between the respondent's department and compliance with vaccination $X^2(3) = 25.57$, $p = 0.000$, $p<0.05$ as represented in table 5.

Table 5: Chi-square test for association between cadre and vaccination/treatment compliance while handling medical waste

		Vaccination/Treatment		X^2	P-value
		Yes	No		
Cadre	Doctors	5(23.8%)	16(76.2%)	25.57	0.000
	Lab Technician	25(50%)	25(50%)		
	Support Staff	8(14%)	49(86%)		
	Nurses	71(49.3%)	73(50.7%)		

3.2.6 Association between cadre and PPEs compliance while handling medical waste

The results showed that there was statistically significant association between use of personnel protective equipment and cadre, $X^2(3) = 11.36$, $p = 0.001$, $p<0.05$. as represented in table 6.

Table 6: Chi-square test for association between cadre and PPEs compliance while handling medical waste

		Use of PPEs		X^2	P-value
		Yes	No		
Cadre	Doctors	14(77.8%)	4(22.3%)	11.36	0.001
	Lab Technician	37(77.1%)	11(22.9%)		
	Support Staff	29(76.3%)	9(23.7%)		
	Nurses	122(89.1%)	15(10.9%)		

3.2.7 Association between cadre and Reporting of the injury experienced during handling medical waste

Reporting injury compliance was also assessed where it was revealed that, there was statistically significant association between respondent's cadres and reporting injury compliance, $X^2(3) = 30.54$, $p = 0.001$, $p<0.05$ as represented in table 7.

Table 7: Chi- square test for association between respondents' cadre and Reporting of the injury experienced during handling medical waste

		Reporting injury		X^2	P-value
		Yes	No		
Cadre	Doctors	2(28.6%)	5(71.4%)	30.54	0.001
	Lab Technician	29(65.9%)	15(34.1%)		
	Support Staff	9(28.1%)	23((71.9%)		
	Nurses	90(76.9%)	27(23.1%)		

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The findings indicated that the association between segregation compliance of medical waste and socio-demographic showed that there was statistically significant association between years of working and segregation of medical waste generated. Analysis of association between schedule for collecting medical waste and department was conducted where results showed that there was statistically significant association between department and schedule for collecting medical waste . The level of compliance between department and the level of emptying was assessed. The results showed that there was no significant association between emptying level compliance and department. The results showed that there was statistically significant association between use of personnel protective equipment and cadre and that the Reporting injury compliance was also assessed where it was revealed that, there was statistically significant association between respondent's cadres and reporting injury compliance

5.2 Conclusions

The study concluded that there was association between years of working and correct waste segregation where individuals who have been working in the hospital for less than five years had accurate waste segregation compared to older staff within the hospital. There was no association between department compliance with level of waste emptying across all the departments. Vaccination was still a major challenge considering that majority of the respondents were not vaccinated which leaves them highly exposed.

5.3 Recommendations

From the findings, the study recommeded that there was a need to Train staff on medical waste management practices which will provide a strong system that can help improve compliance in segregation, safety measures and risks mitigation.

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