KNOWLEDGE, ATTITUDE AND PRACTICE OF MEDICAL WASTE MANAGEMENT AMONG HEALTH CARE PERSONNEL AT DISTRICT HEADQUARTER HOSPITAL NANKANA SAHIB

Tayyba Jamil[1], Muhammad Saleem Rana[2]

1. Respiratory Therapist: District Head Quarter Hospital, Nankana Sahib
2. Prof. of Public health: University institute of Public health, the university of Lahore

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Corresponding author:
Tayyba Jamil
Email: tayyabajamil962@gmail.com

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ABSTRACT

Background: In order to minimize the incidence of diseases caused by improper waste management, investigating the level of knowledge, attitude, and practice among the health care providers in District Headquarter Hospital Nankana Sahib, Pakistan, was necessary. Improper medical waste management is one of the most injurious challenges causing a number of health problems for staff working and dealing with medical waste in hospitals.

Objective: This paper aims to investigate the knowledge, attitude, and practice among the health care providers working at District Headquarter Hospital Nankana Sahib about medical waste management.

Methodology: The study was conducted at DHQ Hospital Nankana Sahib, and the sample was selected through simple random sampling. A total of 145 HCWs were estimated using % of high Knowledgeable as 89.5% among health care workers; 5% margins of errors were used, and 95% confidence level was taken by using WHO software.

Results: It was found that the mean total knowledge score was 9.67 ± 1.17 (3-11), the mean total attitude score was 6.23 ± 2.12 (0 – 9), and the mean total practice score was 11.25 ± 2.34 (8- 20). There were 37(25.5%) participants who had low and 108(74.5%) participants who had high knowledge. There were 65(44.8%) participants who had negative, and 80(55.2%) participants had positive attitudes. There were 68(46.9%) participants who had poor and 77(53.1%) participants who had good practices. The low knowledge was associated with lower age groups (91.9% of subjects aged 26-40 years old and 8.1% of subjects of 41-60 years old cases had low knowledge). Low knowledge was also associated with qualifications, and negative attitude also associated with members belonging to lower age group.

Conclusion: In the current study, it was concluded that health care personnel working at District Nankana Sahib hospital have good knowledge, attitude, and practice in medical waste management. However, workers belonging to lower age groups and qualifications have less knowledge as compared to the health care personnel having good qualifications (MBBS or BS nursing) with more age. A significant positive correlation between knowledge and attitude scores with years of practice was also found.

INTRODUCTION

Medical waste management is a pressing and hazardous issue confronting humanity today. The World Health Organization (WHO) defines medical waste as the waste produced during the treatment, diagnosis, and immunization of humans and other organisms. Mishandling of medical waste can pose significant health risks to healthcare providers.[1] Improper disposal of medical waste not only poses a potential health risk to healthcare workers but also has the potential to impact the general public if microorganisms from the waste become airborne.[2]

Healthcare workers are particularly vulnerable to work-related injuries and illnesses, largely due to the lack of knowledge, awareness, and adherence to standard medical waste management (MWM) protocols.[3] This lack of proper knowledge, attitudes, and practices (KAP) among healthcare providers is a significant contributing factor to their high-risk status in this sector.[4]

Improper waste disposal makes these healthcare centres a hub of various infectious diseases instead of achieving the aim of providing the best healthcare services all over the country.[5] Medical wastes produced by healthcare institutions create a considerable amount of health and environmental risk. Transportation, collection and disposal of medical waste as per world standards or Regulation on the Control of Medical Wastes are mandatory to prevent the health care professionals and the public from its potential health risks.[6] In this regard, the health care professionals, especially those who directly deal with the segregation, disposal as well as transportation of biomedical waste, must be well-educated, well-trained and well-prepared for standard medical waste management rules, especially in developing countries that often face a financial crisis.[7] To save the healthcare providers, environment, patients, and public from injuries by sharp tools and virus infections like HIV, Hepatitis B and C, the promotion of proper KAP of medical MWM among the waste handlers is necessary. Only highly trained and well-educated staff can save the environment from dioxin and other toxic elements contaminating the air.[8] Developing countries like Pakistan that do not afford expensive waste disposal plants should nullify the hazardous effect of these pollutants by following Pakistan Environmental Protection Act 1997 (PEPA).[9] Thus, the current study aims to explore the KAP of the healthcare professionals in the public sector hospital located in Nankana Sahib to know what kind of modification in the traditional waste management system can further improve the existing environment and health condition of

MATERIAL AND METHODS

Study Design: Descriptive cross-sectional.

Settings: The study was conducted at DHQ Hospital Nankana Sahib. It was established in 1972. It is located on Hospital Road, Nankana Sahib. The total area inside its boundary is around 5 77,685 35 sq. ft.

Duration of Study: As this is a thesis based article, so the study was done in nine months after the approval of synopsis

Sampling: Simple random sampling

Sample Size: A total of 145 HCWs were estimated using % of high Knowledgeable as 89.5%[8] among health care workers; whether the 5% margins of error and 95% confidence level using WHO software was used for this study. While the sampling technique was simply simple random sampling to avoid biasness in results representation.

Inclusion criteria:

- Health care workers belonging to the age group of 25 -60 years,
- Both genders including male and female
- Heath care personnel having at least one year of working experience in DHQ hospital Nankana Sahib

Exclusion criteria:

- Training is essential for increasing the level of KAP among HCWs.
- The staff working in a quality assessment cell, as they have little or no engagement with waste handling practices, were also excluded from this study.
- Staff having a history of memory loss and psychological issues was also not included in study

Data collection procedure: In this study, the population consisted of health care workers working at DHQ Hospital Nankana Sahib, except staff working in the quality assessment cell and who have participated in any type of training regarding hospital waste management, were selected. A Simple random sampling technique was employed and the data was collected by questionnaire. The interviews for data collection were conducted by using the most reliable method, namely, a survey questionnaire. The questionnaire distributed was to the respondent, and they were requested to fill out the given questi-onnaire and it was collected after the time of 48 hours. By using these methods, the required information was collected from health care workers working in DHQ Hospital Nankana Sahib.[11]

Data analysis procedure: Data was entered and analyzed by SPSS (Statistical Package for Social Sciences) version 25. Mean ± SD was calculated for quantitative data. Frequency and Percentage was calculated for categorical data and a Chi-square test was applied to see the association between categorical data(P-value ≤ 0.005 was taken as significant).[12]

RESULTS

The study included a total of 145 participants, with a mean age of 38.42 ± 7.06 years, ranging from 26 to 60 years. The participants had varying levels of experience, with a mean duration of 6.36 ± 3.57 years and a range of 1 to 20 years. In terms of gender distribution, there were 53 (36.55%) male and 92 (63.45%) female participants. Regarding qualifications, the highest proportion of participants had MBBS (38.62%), followed by BS Nursing (38.6%), FCPS and other qualifications (9%), BDS (5.5%), and MDS (3.4%). Occupationally, 63.4% of the participants were doctors/dentists, while 36.6% were nurses. The mean scores for knowledge, attitude, and practice were calculated as follows: knowledge score 9.67 ± 1.17 (ranging from 3 to 11), attitude score 6.23 ± 2.12 (ranging from 0 to 9), and practice score 11.25 ± 2.34 (ranging from 8 to 20). The majority of participants (74.5%) exhibited high knowledge, while 25.5% had low knowledge. In terms of attitude, 55.2% of participants had a positive attitude, while 44.8% had a negative attitude. As for practices, 53.1% of participants had good practices, whereas 46.9% had poor practices. When examining the association between knowledge and demographic factors, it was found that lower age groups were more likely to have low knowledge (91.9% of subjects aged 26-40 years compared to 8.1% aged 41-60 years). However, gender and occupation did not significantly affect knowledge levels. Notably, participants with a BS in nursing had lower knowledge (27%) compared to other qualifications, with a statistically significant difference (p-value ≤ 0.05). In terms of attitude, a negative attitude was associated with lower age groups (86.2% versus 13.8% for negative attitude), participants with an MBBS qualification (63.1%), and those in the doctors/dentists occupation (75.4%). These associations were statistically significant (p-value < 0.05).

Furthermore, poor practices were associated with participants who had a BS in nursing qualification (58.8%) and those in the nursing profession (52.9%), with a statistically significant difference (p-value < 0.05). Correlation analysis revealed a positive correlation between total score and years of practice for both overall score (r = 0.285, p-value < 0.05) and attitude score (r = 0.316, p-value < 0.05). However, no significant correlation was found between total practice score and years of practice (p-value > 0.05). This study highlighted several important

findings regarding the participants' knowledge, attitude, and practice scores. It revealed a higher prevalence of high knowledge, positive attitudes, and good practices among the participants. Age, occupation, and qualifications were found to be associated with knowledge, attitude, and practice outcomes.[13] Furthermore, years of practice demonstrated a positive correlation with overall scores and attitude scores. These findings can inform interventions and educational strategies aimed at improving healthcare professionals' knowledge, attitude, and practices in the field under study.

Table 1: Descriptive statistics of age (years) and years of practice (in years)

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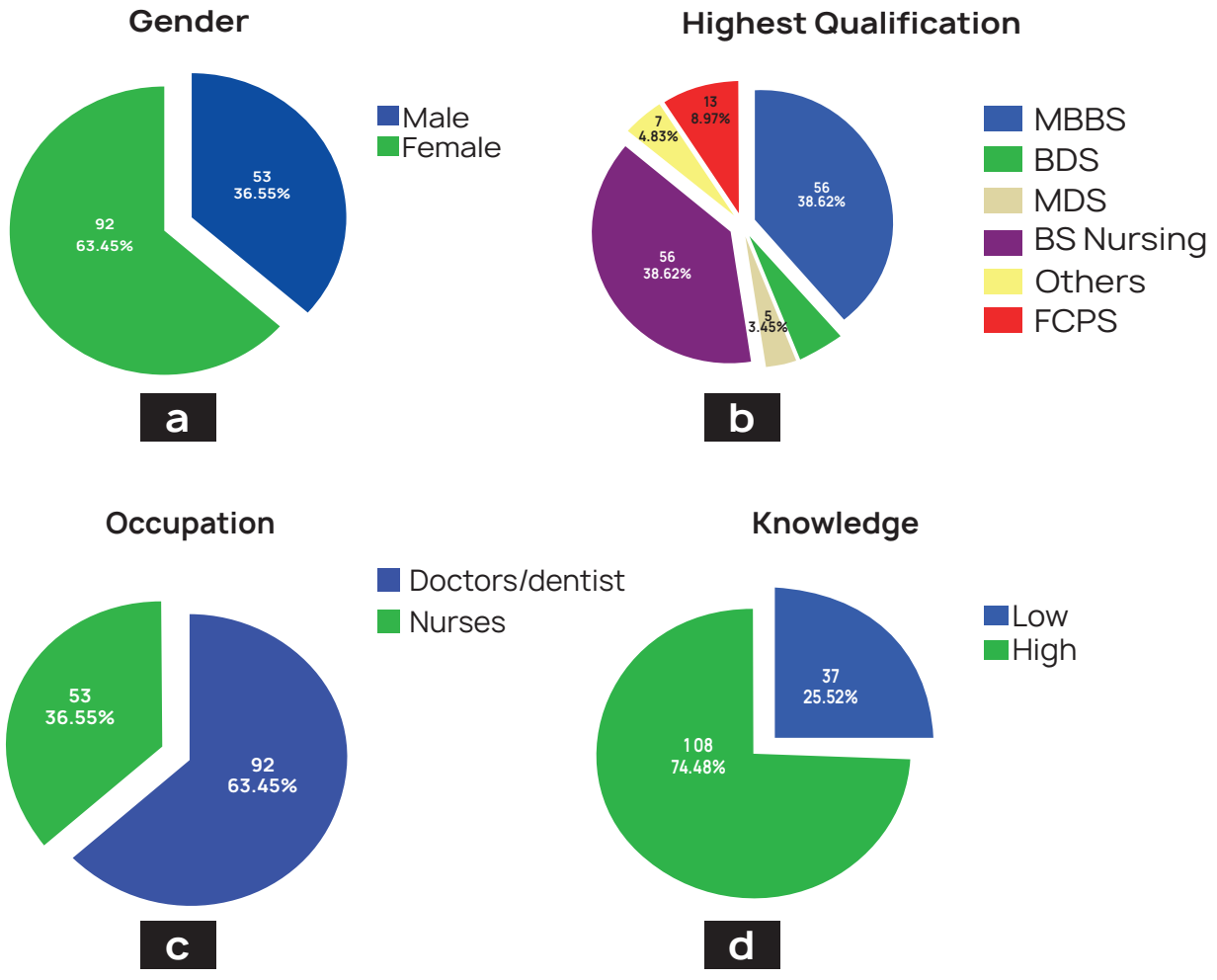
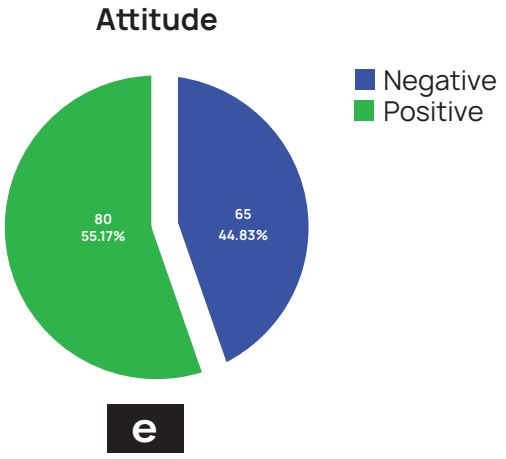
Variables	Age (years)	Years of practise (in year)
Mean	38.42	6.36
S.D	7.06	3.57
Range	34	19
Minimum	26	1
Maximum	60	20





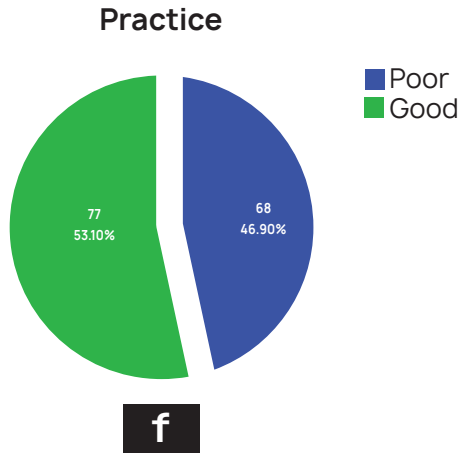


Figure 1: a) Descriptive statistics of gender, b) Descriptive statistics for the highest qualification, c) Descriptive statistics of occupation, d) Descriptive statistics of knowledge,e) Descriptive statistics of attitude, f) Descriptive statistics of practice.

Table-2: Comparison of age groups (years), gender, highest qualification and occupation in knowledge, attitude and practice

Table-3: Correlation between Years of practice (in years) vs total score knowledge, attitude and practice

		Knowledge		Chi-square (p-value)	Attitude		Chi-square (p-value)	Practice		Chi-square (p-value)
		Low	High		Negative	positive		Poor	good	
Age groups	26-40	34 (91.9%)	69 (63.9%)	10.503 .(0.001*)	56 (86.2%)	47 (58.8%)	13.089 (<0.001**)	47(69.1%)	56(72.7%)	13.089 (<0.001**)
	41-60	3(8.1%)	39(36.1%)		9(13.8%)	33(41.2%)		21(30.9%)	21(27.3%)	
Gender	Male	11(29.7%)	42 (38.9%)	0.997(0.318)	26(40%)	27(33.8%)	0.604 (0.437)	21(30.9%)	32(41.6%)	0.604 (0.437)
	Female	26 (70.3%)	66 (61.1%)		39(60%)	53 (66.2%)		47(69.1%)	45(58.4%)	
Highest Qualification	MBBS	20 (54.1%)	36 (33.3%)	15.247 (0.009*)	41(63.1%)	15(18.8%)	37.442 (<0.001**)	21(30.9%)	35(45.5%)	37.442 (<0.001**)
	BDS	3 (8.1%)	5 (4.6%)		4(6.2%)	4(5%)		0(0%)	8(10.4%)	
	MDS	0(0%)	5(4.6%)		0(0%)	5(6.2%)		3(4.4%)	2(2.6%)	
	BS Nursing	10(27%)	46 (42.6%)		15(23.1%)	41(51.2%)		40 (58.8%)	16(20.8%)	
	Others	4(10.8%)	3(2.8%)		4(6.2%)	3(3.8%)		1(1.5%)	6(7.8%)	
	FCPS	0(0%)	13(12%)		1(1.5%)	12(15%)		3(4.4%)	10(13%)	
Occupation	Doctors/ dentist	26 (70.3%)	66 (61.1%)	0.997 (0.318)	49 (75.4%)	43 (53.8%)	7.238 (0.007*)	32(47.1%)	60(77.9%)	7.238 (0.007*)
	Nurses	11 (29.7%)	42 (38.9%)		16 (24.6%)	37 (46.2%)		36 (52.9%)	17(22.1%)	

Years of practise (in years) vstol score knowledge. attitude and practise			
	Total Score Knowledge	Total Score Attitude	Total Score Practise
Pearson Correlation	0.285**	0.316**	0.007
P-value	0.001*	<0.001**	0.936
No. of subjects	145	145	145

DISCUSSION

Research conducted in Pakistan indicates that each day approximately 2 kg of waste is generated per bed. Among this waste, about 0.1–0.5 kg falls under the category of risk waste. Unfortunately, mismanagement of this waste occurs at various stages, starting from segregation during collection up to its final disposal.[14] It is crucial to highlight that health-care-related waste poses a greater risk of infection and injury compared to other types of waste. Improper handling and lack of knowledge regarding healthcare waste management can lead to severe health consequences and have a significant environmental impact as well.[15] This analysis of the waste composition revealed that 73.85% was general waste, 25.8% was hazardous infectious waste, and 0.87% was sharps waste. The general waste mainly consisted of paper (15.76%), plastic (13.41%), textiles (21.77%), glass (6.47%), rubber (1.99%), metal (0.44%), and others (40.17%).[16]

A number of studies have addressed a list of reasons for lack of knowledge, awareness, and understanding about the implementation of the waste management rules in hospitals, basic knowledge about medical waste composition, and unsafe practices about waste disposal along with the risk associated with the improper waste management and its environmental impact.[17, 18] However, in already published scholarly work, only a few studies address the management status of biomedical waste in hospitals was discussed. Furthermore, current practices and issues in waste management impose another gap that needs to be bridged in the District hospitals of Pakistan. The present study is based on assessing and linking the ongoing practices of HWM in the District hospital Nankana. In the current study, the mean age of participants was 38.42 ± 7.06 years, with minimum and maximum ages of 26 and 60 years. In a study conducted by Ekanem et al., the mean age of the respondents was 36.7±12.7 years, and the mean age of respondents was almost similar to the current study.[19] Another study reported that by Malik Net al.46.2% of respondents were in age groups 20 to 25years. While 42.0% of respondents consisted of age group 26 to30years and only 11.8% of respondents consisted of age category 31years above.[20] In the current study, we found a higher male-to-female ratio as there were 53(36.55%) male and 92(63.45%) female cases. In comparison with the study of Adu RO et al. reported that more male respondents106 (61.27%) than females 67(38.73%).[21] The findings are in contrast to another study where a higher male ratio was reported, i.e. Akkajitetal. study included most females, i.e. out of 344, 300 were females (87.2%) and males 44(12.8) [8]. A study conducted by Malik, N et al.[20] on Pakistani population reported that females respondent 55.0% were higher than male 45.0% respon-

dents, this study results also similar with the current study. In this study, according to occupation, 92(63.4%) were doctors/ dentists, and 53(36.6%) were nurses. A study done by Singh et al. found the occupation of respondents were doctors, paramedics and medical students studying at –King George's Medical and Dental University, Lucknow, India, with percentages of 83.3%, 80%, and 66.7%, respectively. A study by Malik N et al.[20] reported similar results to the current study; according to occupation, 56.0 percent of respondents were doctors, and 44.0 percent of respondents were Staff Nurses. In our study, there was no significant difference between low knowledge with occupation (p-value < 0.05.) A study by Adu RO et al. reported that 6 groups of respondents having statistically significant (p < 0.0001) differences in waste-sorting behaviour.[21] In our study, the mean duration of the experience was 6.36 ± 3.57 with 1-20 years of experience. A study of Malik N et al. shows that 46.0% of the respondents had working experience of 1 year to 3 years, 48.2% of respondents had working experience of 4 years to 6 years, and 5.8% was above 6 years. However, this study reported a lack of knowledge and awareness about biomedical waste management in India, even though the experience of all health care professionals was fairly distributed.[8] A study conducted by Nagaraju et al. (2013) at a primary health care centre is also good evidence to support this study.[22] In this study, low knowledge was associated with lower age groups (91.9% of subjects 26-40 years old and 8.1% of subjects of 41-60 years old cases had low knowledge).[23] There was no significant difference in low knowledge with gender and occupation. The low knowledge was also associated with qualifications as subjects with BS nursing had lower knowledge (27%), p-value ≤0.05. In the current, there was no significant difference in low knowledge with gender and occupation. The low knowledge was also associated with qualifications as subjects with BS nursing had lower knowledge (27%), p-value ≤0.05. A study by Sughandi Sharma et al. reported that the Majority (72%) of the residents had average knowledge of BMW management, and around one-fourth of them (20%) had good knowledge of the subject, while 8 percent of the residents were found to 57 have poor knowledge.[19] Rao et al. also reported a high level of knowledge about biomedical waste management at Andhra medical college (India). The reason behind this high level of education is most healthcare personnel have received education about medical waste management from some special agencies. Another study byAkkajit P et al. described correlations among Knowledge, Attitudes, and Practice in respect of MWM, Correlation analysis among KAP in respect of MWM was conducted based on Pearson correlation coefficients, and positive and significant correlations (P < 0.01) were found between knowledge and attitude (r = 0.464), knowledge and practice (r = 0.396), and practice and attitude (r = 0.519). Consequently, high knowledge of health care workers was highly associated with good practice and good practice regarding medical waste management, which can be attained consistently with a classification of KAP rating scoring were 91.9 % of participants showed a positive attitude and good practice along with high knowledge. In favor of this claim, Kumar et al.[10] already reported an almost linear association between practice and knowledge of samples (P =< 0.001) and r= 0.541) that specifies a positive relationship between the healthcare professional practices about the standard rules of medical waste management along good knowledge about HCWM. On the contrary to this, this correlation was not observed between attitude and practice.

CONCLUSION

It is concluded that 74.5% of participants had high knowledge, 55.2% of participants had a positive attitude, and 53.1% of participants had a good practices. The low knowledge was associated with lower age and with qualifi-cations in BS nursing. The negative attitude was also associated with the lower age group, participants having MBBS qualifi-cation, while poor practice was associated with qualifi-cation as BS nursing. There was a significant positive correlation between total score with years of practice, i.e. r- 0.285 (p-value < 0.05), and a positive correlation was also significantly positive between total attit-ude score and years of practice, i.e. r = 0.316, p-value < 0.05. There was no significant corre-lation between total practice score and years of practice, p-value > 0.05.

Recommendations: In light of the results of this study, it can be concluded that for health care workers, refresher training courses must be organized regarding waste management and safety measures.

AUTHORS CONTRIBUTION

TJ: Idea generation, data collection, review done, write up,
MSR: Analysis, final writeup

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