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Evaluation of medical waste management in Al-Diwaniyah governorate hospitals under the corona pandemic

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***Abstract*---**Background: Medical waste attracts the world's attention because of its negative effects on the safety of society and the environment. Medical waste management is of great importance due to its infectious and dangerous nature that can cause undesirable effects on humans and the environment. Objective: To assess the sociodemographic, knowledge and attitudes of health workers, cleaning workers, and medical waste administrators among three different hospitals in the Al diwaniya governorate. Methodology: The study was conducted using a cross-sectional survey. A self-administered Arabic language questionnaire was employed to identify cases at random. SPSS Version 21 was used for the analysis. Result: knowledge of all healthcare staff about medical waste management (MW) was insufficient, and attitude levels were weak in all three hospitals. Al-Furat hospital cleaners had average knowledge. The percentage of knowledge in the management of Al-Diwaniyah Hospital was zero, while the other two hospitals had an average rate. Health workers with 1 to 5 years of experience in all establishments have the most knowledge about medical waste. Nurses were the most prevalent job title for dealing with waste Conclusion: The level of knowledge of the administrative staff،health worker, and cleaning workers about medical waste was not up to the required level. The study

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recommends defining integrated medical waste management, defining responsibilities, supporting legislative and regulatory departments, and expanding training programs.

***Keywords*---**medical waste management, training, monitoring, waste disposal, coronavirus.

Introduction

Healthcare workers engage in a wide range of tasks, most of which are related to patient care. While, performing their jobs, they may be exposed to a number of occupational risks, including physical, chemical, biological, ergonomic, and psychological dangers (Abarca 2021). the majority of patients who attend the hospital have infectious illnesses, meaning their waste could pose a risk to staff and other healthcare workers (Singh et al., 2014). Waste management has been a major problem for environmental and public health in Iraq for decades (Mensoor 2020). Waste management is a big challenge in many cities in developing countries (Aziz et al., 2011). Medical waste provides considerable infrastructure, strategic management, and trash disposal issues, particularly in countries where medical waste is not sufficiently controlled (Shalini and Harsh 2012). The current Coronavirus Disease 2019 (COVID-19) pandemic is the most serious global threat since World War II. Globally (Praveena and Aris 2021). After being reported initially to the Chinese WHO office on December 31st, 2019, as an exceptional pneumonia case from Wuhan, the novel coronavirus SARS-CoV-2 was identified as COVID-19 on February 11th, 2020.

People were instructed to wear face masks as a precaution due to the easy spread of coronavirus. They also use hand sanitiser and gloves daily. As a result, there is a lot of medical waste in the environment. Covid-19 gets increasingly active and spreads as time goes on. Concerns about managing trash generated by sick patients, caregivers, and medical labs are growing and had spread to 188 countries by May 2020 (Alrawi, Amin, and Al-Ani 2021). If medical waste isn't properly managed, it'll be classified as hazardous waste. The process may become more cumbersome and complicated as a result of a lack of knowledge about the dangers of medical waste and poor waste management techniques. Large volumes of liquid, solid, and gaseous waste are generated during medical treatment and healthcare services (Falih et al., 2021).

Effective medical waste disposal is critical. It can potentially infect hospital patients, healthcare staff, and members of the general public (Janagi, Shah, and Maheshwari, 2015). Medical waste management varies in every facility, but the challenges are the same across the board, including segregation, collection, storage, transportation, treatment, and disposal (Dawood et al., 2020). Medical waste management (MWM) may not be able to eliminate the risk, but it can help to reduce the negative environmental and public health implications. As a result, MWM is seen as a big problem worldwide (Barua and Hossain, 2021). Clinical waste destruction and disposal are critical steps in reducing the risk of disease or damage during contact with potentially hazardous subjects (Blenkharn, 2006).

Poor hospital waste management puts healthcare personnel, trash handlers, patients, the general public, and the environment in danger(Singh et al., 2014).

Materials and Methods

Study Location

This pilot study was conducted in the Al-Qadisiyah Governorate, one of the eighteen governorates in Iraq. It included four regions (Al-Diwaniyah, Al-Hamza, Al-Shamiya, and Afaq). The governorate population reached 911 thousand people in 2013(Kadhim Ibadi and Hamedon 2015). Participants in this study were surveyed from Al-Diwaniyah General Hospital, Afaq Hospital and Al-Furat Hospital.

Study design and sample

A cross-sectional study design was used. The case is determined by conducting interviews through a multi-questioned questionnaire with those who handle medical waste, including management staff, health workers and cleaners, and from three hospitals that are representative of hospital types selected at random.

Inclusion and Exclusion criteria

Inclusion criteria

All hospital staff who worked in chosen hospitals who deal with medical waste were within samples

Exclusion criteria

Staff who refused to interview them and all workers who are not deal with medical waste.

Data collection

Data were collected using a self-questionnaire in the Arabic version. The entire questionnaire consists of three sections; however, sociodemographic characteristics and a set of questions were mentioned in this article, age, education level, and occupation were included. The data was collected after obtaining verbal informed consent from each participant. The sample size for health workers was (611), the sample size was for administrators supervising waste management (7), and the number of cleaners was (54) distributed among three hospitals, one of which is governmental and one private. A hospital in a remote area. The sample was chosen for the type of hospital randomly from among nine hospitals, with one of them being representative of every kind of hospital. This sample was identical in terms of population and hospital

Data Analysis

(SPSS) Statistical Package for Social Sciences version 21 was used to analyze data. Descriptive statistics, frequencies, percentages, mean and standard deviation**.**

Ethical

The researcher attached an explanation of each questionnaire in Arabic and gave each participant a form of study, including the consent form, the participants were also provided with an information sheet that specifies the purpose of the research and the voluntary nature of participation, and it was assured that their data would be treated with complete confidentiality. All data were treated as confidential and stored securely, with only access restricted to the immediate search team.

Results

Table 1 Pearson correlation among dependent and independent variables for cleaning workers

		Gender	Age	Education Level	Time Of Working	Overall knowledge
Gender	Sig.					
Age	Sig.	.045*				
Education Level	Sig.	.175	.779			
Time Of Working	Sig.	.921	.813	.606		
Overall knowledge	Sig.	.789	.745	.055	.482	
*. Correlation is significant at the 0.05 level (2-tailed).						

Table 2 Pearson correlation among dependent and independent variables for health workers

	Items		1	2	3	4	5	6	7	8	9	10
1	Profession	Sig.										
2	Department	Sig.	.772									
3	Gender	Sig.	.213	.887								
4	Age	Sig.	.381	.388	.184							
5	Educational Levels	Sig.	.399	.220	.338	.528						
6	Experience years	Sig.	.150	.481	.637	.000**	.880					
7	Daily working Time	Sig.	.343	.036*	.913	.680	.103	.732				
8	Type Of Medical Wastes	Sig.	.570	.085	.423	.162	.139	.177	.000**			
9	Overall Knowledge	Sig.	.595	.025*	.527	.425	.297	.534	.002**	.026*		
10	Overall Attitudes	Sig.	.419	.183	.470	.496	.670	.915	.001**	.001**	.017*	
	*. Correlation is significant at the 0.05 level (2-tailed).											
	**. Correlation is significant at the 0.01 level (2-tailed).											

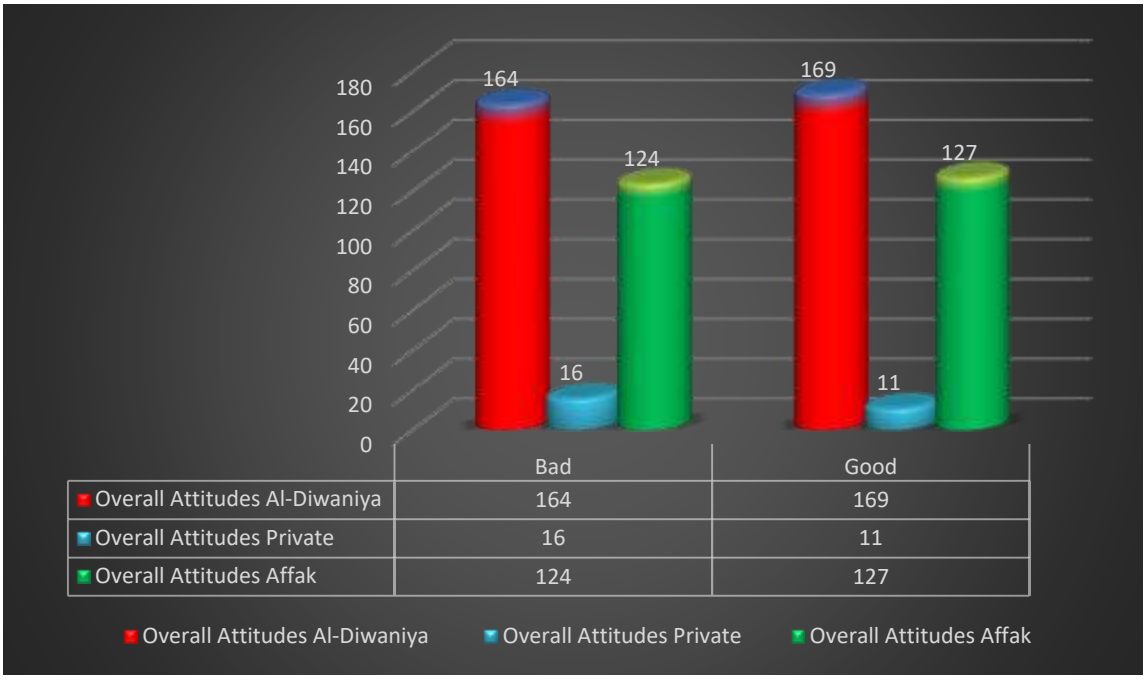

Figure1 Differences in levels of attitudes toward management of medical wastes among three groups of samples for three hospitals (Al-Diwaniya, Affak and Private)

The incinerator and the biological station at Al-Diwaniyah General Hospital

Discussion

On some demographic criteria, there is agreement. Based on the probability value of a previous study, an association was discovered, and there was an intrinsic relationship between knowledge and participants' job (0.02) (Hasan, Abdul-wahid, and Al-musawi 2021). Significant correlations were between students' sex, age,

and class and their waste management attitudes, knowledge, and practices(Hakim, Mohsen, and Bakr 2014).

Health workers' knowledge was weak in the three hospitals, which applies to the administration officials. As for the cleaners, they were more aware than the rest, but not at the required level; the governorates included in the previous study in Iraq varied greatly(Al-nakkash et al., 2019). In 2019, it included several governorates, as Al-Diwaniyah governorate showed very weak efforts in waste management among the rest of the governorates, respectively, which means the presence of quantities of waste. Which was not dealt with properly, and this fact is similar to the researcher's study according to the results that appeared.

Table 2 reveals a significant correlation at a level (0.001) between age and experience years, daily working time, types of medical waste, overall knowledge and attitudes, and overall knowledge and overall attitudes. In addition, there is a significant correlation at level (0.05) among the departments, daily working time, and overall knowledge. Also, between the types of medical waste and the overall knowledge, the scientific level is related to waste management, as it is similar to a previous study (Babaei et al. 2015), which shows that education enables the development of employees' general knowledge, which enhances responsibility towards the environment and health; there is agreement and difference in some demographic factors. According to a previous study, it was found that there is no correlation between knowledge and (gender, age, place of work, and years of work) and that there is a significant relationship between knowledge and the participants' job, based on the probability value of (0.02)(Hasan, Abdul-wahid, and Al-musawi 2021).

Figure 1 showed differences in the levels of attitudes towards medical waste management between three groups of samples for three hospitals (Al-Diwaniyah, Afaq and private hospitals), where skills were generally good (50.8%) in the Al-Diwaniyah governorate. General Hospital, while Afaq General Hospital was good (50.6) and finally Al-Furat Hospital in terms of skill, in general, was good (40.7), and the results of a previous study applied in Botswana(Mugabi, Hattingh, and Chima 2018) were the same low level. Show that there are differences in waste management knowledge, attitudes, and behaviors across different categories of hospital healthcare professionals. Across the board, there were shortcomings in waste management knowledge and skills. The participants in this study were health care workers. Through the questionnaires, there were many employees injured during the handling and handling of waste, and a number of them did not wear personal protective equipment; there was a study of its content (disposal of medical waste is a dangerous task that requires the use of adequate personal protective equipment; how and were not followed up periodically to follow up on the vaccination status er, the personal protective equipment used in this investigation was not sufficient (Deress et al. 2019).

During the samples collected by the researcher, which were distributed among three hospitals for three months, it was found during the questionnaire of the department's employees responsible for following up the waste that there is no separation and division of workers for transporting the medical waste. There is no scale for the weight of waste in each corridor, There are no special refrigerators for

storing corpses to store the remains of human waste, and there is no place designated for storage inside the hospital that is protected by that. Only the concerned employees can access it, and it was found through a questionnaire that the cadre of cleaners is a group of workers within a cleaning company according to a specific time, as they were more familiar with Afaq Hospital and Al-Furat Hospital than Al-Diwaniyah General Hospital. However, Although most of them fill the containers with more than their capacity due to not knowing many of them, this case was found in a similar previous study (Dawood et al. 2020).

The three hospitals do not have a biological station for storing waste temporarily; this is consistent with a previous study (Wassie et al., 2022). According to figure (1), most of those who participated in the questionnaire answered that there is no temporary storage station, and they are 62%) and there is no regular incinerator, and most of them answered that the waste storage place inside the hospital is not safe, and most of them transport regular and infectious waste at the same time and some collect them with municipal waste for disposal, this study is consistent with a previous evaluation study, where the trainees had poor knowledge of biomedical waste management policy (16%). One interesting conclusion was that the trainees had only 50% awareness of the biomedical waste management policy, the answers were different about how hospitals deal with waste according to a guideline, and many answered the lack of motivation of the quads here are no guiding campaigns for workers to deal safely with waste, this study was supported by a previous study (Deress et al. 2019). That found that lack of adequate knowledge, skills, and management can be compromised because good training is critical for MWM success.

However, only 30.9% of the participants in this study were trained perhaps in a simple way and did not give the topic the utmost importance, which is a violation of national and international standards, and the failure to adhere to these guidelines may be due to a lack of inspection by the authorities and the absence of strict rules. This study is similar to a previous study (Letho et al., 2021). However, Our findings appear similar to an earlier study (Manyele and Anicetus 2006), which demonstrated that most health workers have limited knowledge of medical waste management and that additional training for new staff is needed to fill this gap. All new employees in the medical/health industry must take a training course on Medical/Hazardous Waste Management to be prepared to deal with MWM issues in their workplace; also, in terms of the stage of spoilage, a previous study (Hakim, Mohsen, and Bakr 2014), was similar to its findings which showed that health care workers did not effectively implement waste disposal, In addition, our study was in agreement with a previous study, the result of which was that the practice of biomedical waste management was not satisfactory (Sachan, Patel, and Nischal 2012).

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