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The role of hospital staff in dealing with healthcare weast

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Abstract:
This study was conducted to identify and evaluate the role of workers in some private hospitals in dealing with health care waste in Baghdad province, Iraq, and to know the extent of interest of health, administrative and technical staff in the treatment of health care waste through classification, collection, transportation, storage and treatment by freezing, landfilling or fermentation. Doctors, administrators**,** and employees have been working as a measure to measure and evaluate the role of employees where it included (21) paragraphs according to the laboratories of Lycra Quintile, I strongly agree with 1 I do not strongly agree5) and the factor of stability of alpha chromium for the scale 73% the results showed that there is awareness among the health, administrative and service staff Regarding the risks of this waste, there are statistically significant differences in male interest by sex variable, for doctors according to the educational attainment variable, and for those who have served more than 16 years according to the job service variable.
Keywords: medical waste, health care waste, incinerators, private hospitals.

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Introduction:

Toxic wastes, such as those generated by diagnostics, analysis, and health care for dangerous wastes, pose a serious threat to human health because of their chemicals, toxic substances, or pathogens such as (viruses; bacteria; fungi; parasites) which can spread rapidly and cause disease and epidemics in people and society. Of the environmental damage it causes and the need for special techniques to deal with health-care waste, management of health-care waste continues to face problems in many countries, especially developing countries, which often cause pollution and diseases as a result of the transport, storage, and disposal of such wastes in improper ways.

Healthcare workers (such as waste collectors, sorters, and transporters) and patients (including visitors and escorts) are all at risk of being injured or killed by medical waste, as are the people who work in the facilities that collect, sort, and transport it, as well as those who work in the burial and final treatment services.

Hospital employees, patients, and visitors are all in danger from medical waste harm if proper medical waste management procedures are not followed.

The importance of the study:

This study tries to contribute to:

1- to raise awareness among hospital administrators of the importance of properly disposing of medical waste and the positive impact it has on the health and safety of hospital employees and patients by emphasizing the gravity of the issue of properly disposing of medical waste in such a way as to protect everyone's health and safety.

2- Assess the current situation and identify the challenges encountered by healthcare personnel in dealing with trash.

The following are the study's goals:

1. What is the interest level of employees in the way are treating medical waste?
2. What is the interest level of employees in processing medical waste by gender?
3. What is the interest level of employees in processing medical waste according to the number of years of employment,
4. What is the interest level of employees in processing medical waste by their job description?

Medical waste as a concept:

In recent years, the phrase "health-care waste" rather than "medical trash" has been used to describe all sorts of garbage generated by health institutions, including medical waste and rubbish left behind by medical procedures or other related activities. (1)

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They are defined as all that results from the medical activity and can lead to environmental pollution or damage to the health of the organism, including infectious and pathological wastes, acute waste, and radioactive materials, all of which are hazardous wastes, and non-dangerous wastes which are produced by kitchens and management workers (2).

according to the World Health Organization defined includes all waste from healthcare institutions, research centers, labs, and trash from secondary sources such as the health care of individuals in their own homes (3).

is defined as any waste that has been contaminated or has the potential to be contaminated with pathogenic, chemical, or radioactive substances dangerous waste is to society as a result of its collection, storage, transportation, or disposal (4).

Types of healthcare waste:

1- non-dangerous health care waste can be disposed of in the same manner as other non-dangerous waste (5).

2-dangerous health care waste all dangerous waste in healthcare establishments Human and animal remains bodily fluids including blood and derivatives, human secretions, contaminated clothes, syringes, contaminated sharp items, damaged and expired pharmaceuticals, chemicals, and radioactive materials (6).

Table 1: Explain the types of health care waste and examples that describe their description.

to	wastes	Examples
1	Non-infectious waste (daily)	The result of health care for the sick, Older people and the two seats are waste similar to household waste.
2	Infectious waste	They are wastes containing bacteria, such as equipment that touched patients or their secretions.
A	Sharp objects	**Such as needles, stripes, saws, and blades**.
B	Pharmaceutical waste Medicines	Such as expired pharmaceuticals, vaccines, and vaccines.
C	Toxic waste and chemotherapy	Substances are involved in the manufacture, transport, preparation, preparation, or administration of chemotherapy and include the secretions of a patient receiving chemotherapy such as urine, feces, and vomiting.
D	Heavy and radioactive metal waste	Such as batteries, damaged thermometers, blood pressure gauges, anesthesia gas cylinders, and radioactive waste contains all the resulting radioactive materials used in human tissue and fluid examinations and in the procedures for diagnosing, identifying, and treating tumors.

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Damage caused by health care waste:

The nursing staff is the most vulnerable group because of their direct contact with the patient and the use of injections and tingling with sharp machines of needles, injections, combs, and broken glass. According to a U.S. EPA report on wounds caused by acute instruments, there are a lot more cases of wounds caused by acute instruments than there are cases of wounds caused by other instruments, and there are about 17-22 thousand nurses exposed each year to wound accidents (tingling) of severe substances, and more for nurses Out-of-hospital workers in homes, care homes, etc., where the incidence of this segment is 28,000-48,000(3).

According to an EPA study, doctors and dentists are exposed to about 100 to 400 cases of hepatitis C and one to three cases of HIV infection each year in the United States alone, while nurses working in the hospital have a risk of contracting hepatitis C of 56 to 96 per year, while those working outside of the hospital have a risk of 26 to 45 per year. hepatitis C (7).

Cleaners are also exposed to a variety of patient waste, gauze remnants, contaminated cotton, needles, and other potentially dangerous materials regularly, Health concerns associated with the processing, transportation, and cleaning of these wastes are regarded to be present in their workplace. It is estimated that around 3,300 cases of stinging occur in hospitals each year for cases of priapism, in addition to the dangers of waste of the different chemical, radioactive, and biological types They are more vulnerable than nursing personnel to needles and sharp objects (8).

More than 90 percent of the cases in hospitals in developing countries, according to a United Nations report on waste handling problems, are caused by the transmission of microbes through insects, parasites, mice, cockroaches, and other mobile organisms that travel through health-care waste without being treated directly (9).

Landfills and incinerators pose additional risks to human and animal health as a result of the burning and incineration of garbage and its dangerous chemicals and harmful organic compounds, as well as the emissions of gases and heavy metal deposits, which pose a threat to human and animal health if they are not properly handled.

When some plastic medical products, such as needles and medical gloves, are burned improperly, dioxins are released into the environment. Dioxins are considered to be very toxic and have been linked to cancer (10).

chemical and pharmaceutical waste and unwanted or expired substances that may cause poisoning where exposure to drugs used in chemotherapy causes cancers when prepared, administered to patients, or discharged and disposed of is harmful to health workers because of the ability of these substances to kill or deform cells, To expose the ecosystem of water air and soil to pollution with such waste, which environmentalists call environmental pollution and environmental pollution has been defined as a change in environmental properties(11).

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In our poor countries, this might have a direct or indirect impact on biological creatures and infrastructure, as well as human life and environmental harm from toxic healthcare waste, to begin with, they are unable to pay the costs of hiring specialized firms because of the bad economy.

In addition, several developing nations have become dumps because of the export of dangerous waste by the major powers, Union Carbide created a poisonous cyanide facility in Bhopal, India, in 1984, which burst and killed tens of thousands of Indians, among other things. Native Americans were annihilated by the French using smallpox-contaminated blankets, while Germans transmitted carbon fever in Argentina's cattle herds during World War I to transform them into anthrax sources for their opponents.

In 1954, an international convention on the prevention of pollution of the seas was issued in London and in 1972 the United Nations held an environment and human conference in Stockholm, Sweden, and then the Basel Convention on the control of the transport and disposal of hazardous waste across borders in 1972 (1989), then the Earth Summit in Rio de Janeiro, the Brazilian capital, in 1992 and 1997, the Kyoto Conference was held about the Japanese city where it was held, where it was held, where it internationally recognized the threat of humanitarian activities to the environment, particularly the atmosphere.

Main sources of waste:

- Public and private hospitals.
- Laboratories and medical research centers.
- anatomy centers.
- Blood banks.
- Nursing homes for the elderly.

Secondary sources of waste:

- Small hospital institutions, such as dental clinics, acupuncture, and manual massage therapy.
- Specialized hospital institutions, such as psychiatric hospitals and disability care institutions.
- Unhealthy activities include ear-piercing cosmetic homes, tattooing, funeral services, ambulance services, and home therapy.

Steps to deal with healthcare waste:

1- Collecting healthcare waste:

A- Classification and sorting: Health care waste is classified and sorted into patient sections to help reduce the risk of contamination and these tasks are carried out by a team headed by a doctor and nursing nurses classifying and sorting these wastes in various medical departments clinics (12).

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B- aggregation: Health care waste is collected in sections and placed into containers marked according to type and sealed away from patients by the provisions and responsibility of the medical staff of the department and then filled in and pasted to the waste information card of the department, and then cleaners are in charge of collecting and transporting bags and containers of waste from a facility. (13).

C- Transport: It is carried out with a vehicle dedicated to this purpose or containers with moving wheels, which must be taken into account when designing them easily cleaned and tight so that no waste leaks from them.

Wheeled vehicles or containers with wheels are used for on-site transportation, and vehicles must be cleaned daily with the proper disinfectant and closed waste bags set in place.

Waste bags can be put straight into approved vehicles for off-site transfer, but they must be placed in extra safety containers and fulfill the following criteria:

- The vehicle's size should be proportional to the waste's size.
- The load must be stabilized during the transfer operation using an appropriate cover.
- The danger code, as well as the emergency phone number, should be displayed on the vehicle or container (14)

D- Storage: Health care waste is stored by identifying a central location for each health facility to be a center for the collection of hazardous medical waste collected in bags of a different color than non-dangerous waste, and the assembly center is required to be a room or building that is sealed with a fence and equipped with fire safety and protection tools, and the management of this center is based on individuals specialized in the field of **medical** waste (4)

Treatment of medical waste: There are several key considerations to make when establishing a security system for the treatment of medical waste, including isolating this waste to prevent people from being exposed to it and ridding it of the factors that cause infection through natural degradation, how health-care waste reaches the environment without treatment, contributing to the spread of contaminated elements within it by wind, insects, and rodents in the environment, and how health-care waste reaches the environment without treatment, where it contributes to the environmentally harmful elements during the burning or incineration of waste badly, especially in populated places, including:

A- incineration

This is a dry oxidation process that transforms organic and combustible trash into non-organic combustible elements and decreases the size and weight of garbage. It is typically used to treat waste that cannot be recycled, reused, or disposed of at a landfill site (15).

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B- Landfill:
Safe landfilling is a possible alternative for healthcare facilities that follow the minimum health-care waste management program, particularly in isolated or troubled areas, and access to the landfill site should be restricted to licensed staff only, In low-income communities or tiny healthcare facilities in distant places, especially during emergency or crisis circumstances, on-site secure burials for dangerous healthcare waste are the most convenient option(16), In densely populated places with significant volumes of healthcare waste environmental awareness is at an all-time high, and the ultimate treatment system must be carefully selected based on local conditions.

C-Fermentation:
This method is especially appropriate for pharmaceuticals and ash from high-metal incineration processes, and it involves adding a mixture of water, lime, and cement to waste before disposal to reduce the risk of toxic substances in waste traveling into groundwater and surface water (17).

Sample:
The current research included workers in private hospitals, doctors, administrators, and technicians in five private Iraqi hospitals in Baghdad province, Albinouk private Hospital, Marina Private Hospital, Al Masara Private Hospital, alqimma surgical hospital, and Dijla private hospital, and distributed the scale of the study and responded (221) employees of them. Male (51.13%) and (108) females (48.86%) and the distribution of sample members by years of service was as follows from (1-6) years of number (56) of the sample members The number of males (36) and females (35.71%) and females (35.71%) and those with years of service (7-15) years were 137 male (63%) and now 45.98% and 10% male. 74 percent (54.01 percent) of those who had more than 16 years of service were male (14) and 50 percent were female, while the distribution of sample members by career level was as follows. Of the 80 members of the sample, 32 were males (40 percent), 48 percent were females (60 percent) and 72 were male (58.33 percent) and 58.33 percent were female. (30) 41.66 percent of the respondents were technicians, 69 of the sample members were male (39), 56.52 percent, and 30 females (43.47 percent), and table 1 shows this.

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TABLE (2): Demographic features of the Sample

Characteristics	Male	Female	N	%
Gender			221	
Male	113			51.13
Female		108		48.86
The Work			221	
Doctors			80	
	32			40
		48		60
Administrative			72	
	42			58.33
		30		41.66
Technician			69	
	39			56.52
		30		43.47
Years of service			221	
1 – 6			56	
	36			64.28
		20		35.71
7 – 15			137	
	63			45.98
		74		54.01
< 16			28	
	14			50
		14		50

Search tool:

The researcher carried out a measure that measures the opinions of hospital workers doctors, administrators, and technicians about the waste of health care and the role of the administration in addressing it study in Iraqi health institutions study in private hospitals in Baghdad province and the scale consisted of (21) paragraphs and were five-year alternatives according to the concept of leckert quintet (I strongly agree ..... I don't agree strongly, and

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reliability was calculated in alpha Krumbach, with a reliability factor and scale reliability (73%).

Results:

To identify the role of workers in the treatment of health care waste study in Iraqi private health institutions, the researcher analyzed the data obtained statistically and found that the average sample members by gender variable where the average arithmetic of males (75.48) and standard deviation (7.20) and the calculated T value (0.48) was 21) The table value (2.58) was at the indication level (0.01), the female arithmetic average (75.28) and standard deviation (6.65) and the calculated T value (0.21) was the scheduling value (0.21) 2.58) at the indication level (0.01) and the hypothetical average of the research sample (20).

The average sample personnel by years of service of (1-6) were found to be (67.54), with a standard deviation (of 5.80), the average years of service (7-15) were (74.54) and a standard deviation (of 7.40), and the average number of those Their service is more than (15) is (77.18) and standard deviation (28.59), and the calculated value (2.77) was greater than the scheduled p.m. value of (4.60) at the indication level (0.01).

The average sample by work was the average of doctors (76.01), standard deviation (7.03), the average arithmetic of administrators (75.89), and standard deviation (7.10) while the arithmetic average for technicians (74.12) and standard deviation (6.53) and the calculated PF (1.68) was smaller than the table value (4.60) at the indication level (0.01), and table 2 shows this.

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Table (3): shows the results research

Variables	
N= (221)	
Gender	
Male	Mean = 75.48 Std.=7.20
Female	Mean = 75.28 Std.=6.65
	T= 0.21
	Sig= .01
The work	
Doctors	Mean = 76.01 Std.=7.03
Administrative	Mean = 75.89 Std.=7.10
Technical	Mean = 74.12 Std.=6.53
	F = 1.68
	Sig= .01
Years of service	
1 – 6	Mean = 74.54 Std= 5.80
7 – 15	Mean = 76.54 Std=7.40
> 16	Mean = 77.18 Std=28.59
	F= 2.77
	Sig= .01

Discussion:

After statistical processing of the data of the sample members of (221) staff in private hospitals and after testing the difference between the average sample of (75.38) and the hypothetical average (63) using the T-test equation of a single sample, it was statistically indicative of an indicative level (63) 0.01) Where the calculated T value (26.91) is greater than the t-

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table value (2.33), indicating that there is an interest among workers in treating health-care waste in the hospitals in question through the method used in collecting, transporting and sorting Waste being at the level of awareness and proper training in the process of collecting, transporting and storing waste.

In line with Ibrahim's study (2015) entitled The effectiveness and impact of the application of occupational safety and health procedures in the performance of staff at Khartoum Teaching Hospital, the study confirmed the commitment of management and staff to a high degree in the presence of occupational safety and health procedures in the hospital(18) and varies with a Dhaif study (2016) entitled: Management of healthcare waste at Amederman On Hospital Waste Management System in the hospital is very low(19) It disagrees with Hassan & Vaccari's study (2018) Waste Management Healthcare Study In Sudan and concluded that the Health Care Department in Sudan is ineffective, as medical and household waste is collected together and improperly disposed of(20).

As for the level of interest of workers in treating health-care waste by gender variable, it is noted that the calculated T value (0.21) is smaller than the table T value (2.58), indicating statistically significant differences in male interest by average calculation The average arithmetic for males (75.48) and the average calculation for females (75.28) was that most of the managers of the waste treatment process were male because the process required a muscular effort to transport, load and unload, in addition to bad smells and risks.

As for the level of interest of workers in the treatment of health care waste according to the variable of educational attainment, it is noted that the calculated p.m. value (1.68) is smaller than the scheduled value of the p.m. (4.60), indicating statistically significant differences in favor of doctors by calculation average. The 76.01 doctors were more aware and aware of the danger of health care waste to individuals and the environment, while in third place their average arithmetic (74.12) of technicians was less educational or without education, which weakens health awareness they have of the seriousness of health waste and its impact on the individual and society

As for the level of interest of workers in the treatment of health care waste according to the variable duration of functional service, it is noted that the calculated value of 2.77, which is smaller than the scheduled value of the p.m. (4.60), indicating that there are statistically significant differences in favor of those who have had a service for more than 16 years of interest in the treatment of health-care waste as there is a significant role for the experience gained during their years of service, which has developed on the seriousness of this waste and has accelerated its treatment, which has an impact on the environment. And the health of the community, but the group that got the lower average arithmetic was less than their service (1-6) years

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because this group does not have enough experience and a clear perception of the seriousness of this waste and its impact on the environment and society compared to those who have experience in work.

Results:

Through the study, some important results were produced:

1- Health, administrative, and service personnel are aware of the hazards of this waste and the means for dealing with it.

2. By gender variable, there are statistically significant differences in favor of males, with males accepting greater responsibility for dealing with health-care waste than females.

3- Because doctors are aware of the consequences of healthcare waste, there are statistically significant differences in favor of doctors based on educational attainment.

4. According to the job service variable, there are statistically significant differences in favor of those who have served for more than 16 years because years of work provide workers with detailed information on healthcare waste and its seriousness over a long period of dealing with it and awareness of the damage.

Recommendations:

The following suggestions were made as a result of this research:

1. Healthcare waste disposal is difficult and requires collaboration between ministries (Ministry of Health, Ministry of Environment, and Baghdad Secretariat) as well as companies contracted by the Hospital Administration and individuals working in services and incinerators, where hazardous materials, humans, and animals are properly disposed of.

2. Prevent service employees from burning garbage within containers to safeguard the environment and public health, and set up a central treatment plant to process liquid waste from hospitals by environmental regulations.

3. Do not entrust the isolation and destruction of waste to service workers hired by the hospital administration who lack the utmost health awareness and are unaware of the dangers of mixing hazardous medical waste with regular waste, which is transported directly to landfill sites via municipal cars.

4. Holding training courses and induction seminars to introduce the seriousness of waste, the importance of wearing personal protective equipment, and working to raise awareness and environmental education through local and regional seminars and conferences to allow sharing of experiences in solving environmental issues and learning about the latest programs and technologies in the field of environmental protection and pollution control.

5. Enclosing the treatment facility to prevent tampering and the capture of stray animals.

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