

## Full Length Research Paper

# Assessment of Medical Waste Management within Selected Hospitals in Gaza Strip Palestine: A Pilot Study

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**Abstract.** The present study aims to provide information about the management, segregation, storage and disposal of medical wastes in public as well as private hospitals in Gaza Strip-Palestine. A cross sectional study was employed and simple random sampling technique were used to distribute a semi structured questionnaire among 164 health workers at two hospitals in Gaza Strip with 100 respondents from governmental hospital and 64 respondents from private hospital. The results disclosed that, healthcare facilities whether private and governmental hospitals still suffer from inappropriate biomedical wastes management which have not received sufficient concern according to 60% of participants who pointed out that hazardous and medical wastes are still handled and disposed together with domestic wastes and segregation was applied only for sharp waste which is collected in special sharp boxes at the beginning after usage. Furthermore, around 47% of respondents don't know where medical storage place is, and don't know if there is mark to show place of storage. Besides, 42% of respondents don't know if it's there mean for transferring medical waste, and 43% don't know its type or if it's available always. In the surveyed hospitals, there is deficiency in implementing training courses about healthcare waste management as 23% only of all study subjects had been provided with training on how to deal with medical waste. Therefore, the Ministry of Health and healthcare institutions should give more consideration towards policies for the proper management and disposal of health care wastes in order to develop medical waste management practices in Palestine.

**Keywords:** Medical waste, hospitals, assessment, management, Gaza Strip, Palestine

### ABBREVIATIONS:

United States Environmental Protection Agency (USEPA); Health Organisation (WHO); Human Immunodeficiency Virus (HIV); Bloodstained Body Fluids (BBF); Medical Waste Hospitals (MWHs); Hepatitis B Virus (HBV); Acquired Immune Deficiency Syndrome (AIDS); Ministry of Health (MOH); Medical Waste (MW); Medical Waste Management (MWM); Primary Health Care (PHC);

## 1. INTRODUCTION

Medical and health-care wastes have sharply increased in recent decades due to the increased population, number, and size of health care facilities, as well as the use of disposable medical products (Mohee, 2005). According to the United States Environmental Protection Agency (USEPA) medical wastes contain all waste materials generated by health-care facilities, such as hospitals, clinics, physician's offices, dental practices, blood banks, and veterinary hospitals/clinics, as well as at medical research facilities and laboratories (USEPA, 2013),

that can include a wide range of materials, such as used needles and syringes, soiled dressings, body parts, diagnostic samples, blood, chemicals, pharmaceuticals, medical devices and radioactive materials (Ananth et al., 2010).

Where it is now commonly recognized that certain types of medical waste are among the most hazardous and potentially dangerous of emerging wastes across many communities (Bdour et al., 2006) where medical waste can be classified into two major groups: general and hazardous waste (Taghipour and Mosaferi, 2009). According to World Health Organisation (WHO, 2009) 80% of medical waste are benign and

comparable to domestic waste while the remaining approximate of 20% is considered hazardous, as it may be infectious, toxic and/or radioactive. Infectious wastes together represent the majority of the hazardous waste (up to 15%) from health care activities. Sharp objects, genotoxic waste, heavy metals (1% each), chemicals and pharmaceuticals (3%) constitute the rest of the hazardous waste (WHO, 2009).

In addition it have cited that The hospital wastes also contains infectious wastes which if not properly disposed of pose a great health risk to the public (Askarian et al., 2004) furthermore, improper waste management can lead to environmental pollution (water, air, soil and etc), unpleasant smells, can foster the growth and multiplication of insects, rodents, and worms, and may lead to transmission of diseases like typhoid, cholera, human immunodeficiency virus (HIV), and hepatitis (B and C) (Abdulla et al., 2008).

Exposure to medical waste can result in disease or injury, were the risk of sharps injury and bloodstained body fluids BBF exposure appeared high in medical waste hospitals (MWHs) (Shiferaw et al., 2012) . In UK reported 40 incidents of sharps injuries associated with medical waste handling (Franka et al., 2009), in developed countries have shown that occupational exposure to waste may result in Hepatitis B Virus (HBV) infection (Dounias et al., 2005). Hospital-waste handling is a hazardous waste activity which requires a high standard of training. It calls for specific training that depends on the nature of the work in the hospital, the hazards and possibility of worker exposure, and the responsibilities of individual workers (Manyele and Anicetus, 2006). The training must not only be continuous, but also comprehensive, integrated and structured with the necessary elements. To reach the qualified stage, the training must follow some of the following steps: need analysis; training administration; learning objectives development and lesson plans; site-specific training; task-specific training; and supervision.

In Palestine the management of medical waste was not given the proper attention (Khala, 2009). In Gaza Strip the segregation is done only for sharps and there are no colour-coded bags. Medical waste is stored and disposed of with domestic waste in primary health care clinics and is incinerated in hospitals, but there are no emission control or safety measures in addition there are some gaps in knowledge of health care workers, and current practices are inadequate (Massrouji, 2001) the operation of incinerators in Palestine insufficient and un acceptable because of the emissions of smoke and smells which affect health and the environment of the area (AL-khatib and Sato, 2009). , in the West Bank, many hospitals are using autoclaving to treat positive bacterial cultures, blood

samples, syringes or any waste produced from testing or treatment of patients who are infected by acquired immune deficiency syndrome (AIDS) (Massrouji, 2001) .This study aims to provide some insight into assessment of medical waste management in Gaza Strip – Palestine, as well as to assess if there is any control measures for health care workers safety.

## 2. MATERIALS AND METHODS

### 2.1. Study sample

A pilot study was carried out in two hospitals in Gaza Strip after receiving the formal approval from the Director – General of the Ministry of Health (MOH). Al Shifa hospital in Gaza city represents governmental hospital and Al Awdah hospital in the north area represents nongovernmental hospital.

### 2.2. Study methods and tools

A self reported questionnaire for medical waste management obtained from a study which was applied in Malaysia, after receiving approval from the study researchers in the University Sains Malaysia, and then the present study researchers added minor modifications according to Gaza Strip context and translated to Arabic subsequently used in gathering the required data. The data collected were based on a 7 page survey aimed at assessing background of the health care workers, the process of segregation, handling, transportation, and storage of medical waste, in addition to training programs for health workers and medical waste handlers, as well as to assess if there is any control measures for their safety.

Sampling was random according to a sampling plan that allocated representative categories in the two facilities. As health workers should have minimum level of knowledge about medical waste management practices, therefore the same study tool which contains the same questions was conducted on different health care levels (Massrouji, 2001). Self response questionnaire were distributed among 164 health workers at two hospitals in Gaza Strip with 100 respondents from Al Shifa hospital in Gaza as governmental hospital and 64 respondents from Al Awdah hospital in North Gaza as private hospital, and response rate were 100%, as the questionnaire was completed in each hospital during frequent visits by the survey team which was helpful in obtaining the information and the study subjects were cooperative with the survey team.

### 2.3. Data analysis

The data gathered from the survey was checked for consistency and completeness, then compiled with a computer and statistical analysis was carried out using SPSS (v. 16.0) Software. Frequencies, cross tabulation and percentage were used and presented.

## 3. RESULTS AND DISCUSSION

### 3.1. Background information about the study respondents:

Table 1 summarize the distribution of respondents based on socio demographic factors. The study

involved different categories of health workers at hospitals who supposed to deal with medical waste directly, as 25 % of respondents were doctors, 34% nurses, 22 % cleaners, while the other 19% of respondents were distributed among laboratory technician, X-Ray technician, pharmacist, cleaner, in addition to quality management personnel who are responsible about quality assurance at health care centres.

**Table 1:** Distribution of respondents based on socio demographic factors

		Distribution of respondent based on socio demographic factors		
		Al Shifa Hospital: Gaza Area, Governmental Service	Al Awdah Hospital : North area, Private Service	Total
<b>Gender</b>	Male	64	30	94
	Female	36	34	70
<b>Field of work</b>	Doctor	26	15	41
	Nurse	30	26	56
	Laboratory Technician	6	1	7
	Quality Management	4	1	5
	X-Ray Technician	5	0	19
	Pharmacist	5	3	8
	Cleaner	22	14	36
	X-Ray Doctor	1	0	1
	Anaesthesia Technician	1	0	1
Administrative	0	4	4	
<b>Type of Service</b>	Governmental	100	0	100
	Private	0	64	64
<b>Area of hospital</b>	Gaza City	100	0	100
	North Area	0	64	64
<b>Working Experience</b>	less 1 years	8	13	21
	1-3 years	23	7	30
	4-7 years	20	14	34
	8 years & above	49	30	79

### 3.2. Training about Health Care Waste Management

Results of the study (Table 2) show that training courses and awareness programs about medical waste management for health care providers and workers at hospitals were limited, as 23% only of all study subjects received training while 77% of them at 2 hospitals didn't receive any training about medical waste management (MWM) with no differences between governmental or private hospitals. In study of Abdulla et al. (2008) in Jordan about 29% of the hospitals had not provided training to doctors and

other personnel about medical waste management and their potential hazards. Some hospitals (57%) provided limited training for support staff (maintenance engineers/ technicians, cleaning workers). For instance, 14% of respondents at Al Shifa (Governmental hospital) received their training about medical waste (MW) at Ministry of health, while no one of Al Awdah (Private hospital) received training course at MOH, but around 17 % of them received their training inside Al Awdah hospital. The others received their training at different places such as Coopii (Italian organization at Gaza), Japan, private cleaning company for health care workers at Al Shifa

hospital, while respondents of Al Awdah hospitals mentioned that they received their training at Union of Health Work Committees, and Solid waste Council in the North area. About training period there was variation between 1-7 days for about 17% of Al Shifa respondents and 20% for Al Awdah subjects, while about 5% of Al Awada received training for about 1 month and 4% of Al Shifa respondents received it for about 3-4 months.

Only 39% of respondents with 19% from Al Shifa hospital and 20% from Al Awdah hospitals indicated

that training programs for new employees about hospital waste management was provided, whereas 60% of them with 37% of Al Shifa hospital and 23% of Al Awdah stated that new workers are not trained, while about 65% with 44% of Al Shifa and 21% of Al Awdah hospital do not know if new workers being trained or not. In Jordan hospitals indicated that a simple orientation programs for new employees about hospital waste management was provided (Abdulla et al., 2008).

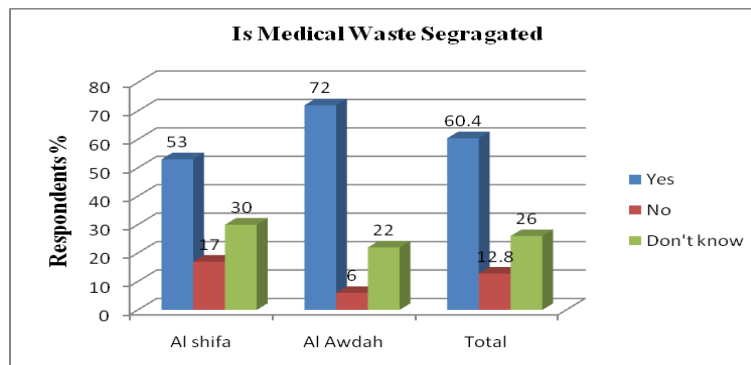


Fig. 1: Percentage of medical waste segregation at hospitals

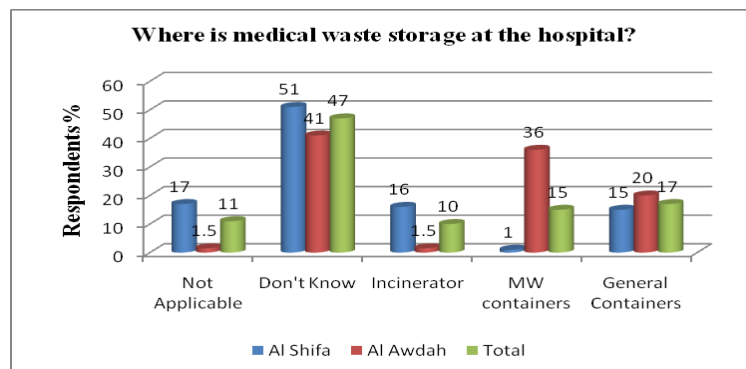


Fig. 2 : Medical Waste Storage at Hospitals

The majority of respondents indicated their needs and willingness to participate in future specialized training programs in medical waste management. On the other hand, medical waste management material and signs were highly requested by the study subjects with their different categories from doctors, nurse, and workers. All hospitals in Jordanian study (100%) indicated their needs and willingness to participate in future specialized training programs in medical waste management. The majority of hospitals (90%) preferred attending annual training. In 71% of the surveyed hospitals, training for top managers was highly required. On the other hand, training programs for medical staff (nurses and doctors), waste handlers, operators and maintenance engineers were requested by 81% of the hospitals (Abdulla et al., 2008). In Egypt, the staffs in healthcare settings are unaware of biomedical waste legislation which was regulated and classified as a hazardous waste, due to the absence of

written policies and clear guidelines, in addition to the inefficient training programs (Soliman and Ahmed, 2007). In Iran there was lack of knowledge and awareness among the personnel in hospitals about the consequences of the potential risk of infectious, hazardous waste and environmental impact, as well as insufficient of proper guidelines, legislation, regulations and instructions on health care waste management (Dehghani et al., 2008). A study among health workers in Gaza Governorates, shown positive attitudes towards instructions need for training and the development of medical waste management system in Gaza governorates (Massrouji, 2001). Whereas in Nablus city in Palestine, the present study at Nablus hospitals revealed that Palestinian national legislation, policy, or regulations about handling and management of medical waste were lacking. No well-defined policies related to medical waste management were available in the hospitals surveyed (AL-khatib and

Sato, 2009). While in India hospitals personnel were trained to take adequate precautionary measures in

handling these bio-hazardous waste materials (Patil and Pokhrel, 2005).

**Table 2:** General Investigation in training issues

		Respondents no. and percentage in each hospital		
		Al Shifa	Al Awdah	Total
<b>Have you been trained</b>	Yes	23 (23 %)	15 (23.4 %)	38 (23%)
	No	77 (77%)	49 (76.6%)	126 (77%)
<b>Place of Training</b>	Received training in different places	23 (23 %)	15 (23.4 %)	38 (23%)
	Didn't receive any training in MWM	77 (77%)	49 (76.6%)	126 (77%)
<b>Training Period</b>	1-7 days	16	13	29
	1 month	0	3	3
	3-4 months	4	0	4
<b>Are new workers trained</b>	Yes	19 (19%)	20 (31%)	39
	No	37 (37%)	23 (36%)	60
	Don't know	44 (44%)	21 (33%)	65
<b>Total</b>		<b>100</b>	<b>64</b>	<b>164</b>

**Table 3:** Medical Waste segregation Practice at Hospital

		Name of Hospital		
		Al Shifa	Al Awdah	Total
<b>Is medical waste segregated?</b>	Yes	53 (53%)	46 (72%)	99 (60.4%)
	No	17 (17%)	4 (6%)	21 (12.8%)
	Don't know	30 (30%)	14 (22%)	44 (26.8%)
<b>Who segregate medical waste</b>	Medical Staff	16 (16%)	9 (14%)	25 (15.3%)
	Cleaning worker	22 (22%)	17 (26.6%)	39 (23.8%)
	Cleaning worker & Medical staff	26 (26%)	26 (40.6%)	52 (31.7%)
	Do not know	32 (32%)	12 (18.8%)	44 (26.8%)
	Not applicable	4 (4%)	0	4 (2.4%)
<b>Place of Segregation</b>	At the beginning near the source	33 (33%)	32 (50%)	65 (39.6%)
	After waste is collected	17 (17%)	12 (18.7)	29 (17.7)
	At the waste storage place in the hospital	13 (13%)	13 (20.3%)	26 (15.9)
	Not applicable	11 (11%)	0	11 (6.7%)
	Don't know	26 (26%)	7 (11%)	31 (18.9%)
<b>Are containers identified &amp; distinguished?</b>	Yes	34 (34%)	39 (61%)	73 (44.5%)
	No	31 (31%)	10(15.6%)	41 (25%)
	Don't Know	35 (35%)	15	50 (30.5)
<b>Are waste sacks subjected to tear?</b>	Yes, always	38(38%)	3 (5%)	41 (25%)
	Sometimes	34 (34%)	28 (43.75%)	62(38%)
	Rarely	11 (11%)	20 (31.25%)	31 (19%)
	No	9 (9%)	11 (17%)	20 (12%)
	Don't know	8 (8%)	2(3 %)	10(6%)
<b>Are waste sacks fastened properly?</b>	Yes, always	39 (39%)	48 (75%)	87 (53%)
	Sometimes	24(24%)	5 (8%)	29 (18%)
	Rarely	5(5%)	2(3%)	7 (4%)
	No	11(11%)	4 (6%)	15 (9%)
	Don't know	21 (21%)	5 (8%)	26 (16%)
<b>Are their provisional measures to prohibit liquids running out from waste?</b>	Yes, always	18 (18%)	24 (38%)	42 (25.5%)
	Sometimes	18 (18%)	11(17%)	29 (17.5%)
	Rarely	11 (11%)	5(8%)	16 (10%)
	No	30 (30%)	6(9%)	36 (22%)
	Don't know	23 (23%)	18 (28%)	41 (25%)
<b>Total</b>		<b>100</b>	<b>64</b>	<b>164</b>

**Table 4:** General investigations in MW Storage Issues

		Name of Hospitals		
		Al Shifa	Al Awdah	Total
<b>Where is medical waste storage at the hospital?</b>	Not Applicable	17 (17%)	1 (1.5%)	18 (11%)
	Don't Know	51 (51%)	26 (41%)	77 (47%)
	Incinerator	16 (16%)	1 (1.5%)	17 (10%)
	MW containers	1(1%)	23 (36%)	24 (15%)
	General Containers	15(15%)	13 (20%)	28 (17%)
<b>Is there special mark to show place of storage?</b>	Yes	10 (10%)	25 (39%)	35 (21%)
	No	36 (36%)	11 (17%)	47 (29%)
	Don't Know	54 (54%)	28 (44%)	82 (50%)
<b>Is storage area sufficient inside hospital?</b>	Yes	9 (9%)	23 (36%)	32 (20%)
	No	25 (25%)	16 (25%)	41 (25%)
	Don't Know	66 (66%)	25 (39%)	91 (55%)
<b>For how long, the medical waste used to be storage?</b>	1-2 days	20 (20%)	17 (26.6%)	37 (22.5%)
	3-5 days	4 (4%)	10 (16%)	14 (8.5%)
	7 days (one week)	5 (5%)	3 (5%)	8 (5%)
	not available	54 (54%)	12 (19%)	67 (41%)
	Don't Know	16 (16%)	22 (34%)	38 (23%)
<b>Is the storage area closed properly?</b>	Yes, always	14 (14%)	29 (45%)	43 (26%)
	Sometimes	13 (13%)	10 (16%)	23 (14%)
	Rarely	6 (6%)	1 (1.5%)	7 (4%)
	No	15 (15%)	4 (6%)	19 (12%)
	Don't know	52 (52%)	20 (31%)	72 (44%)
<b>Is storage area protected well?</b>	Yes	18 (18%)	37 (58%)	55 (34%)
	No	23 (23%)	12 (19%)	35 (21%)
	Don't Know	59 (59%)	15 (23%)	74 (45%)
<b>Total</b>		<b>100</b>	<b>64</b>	<b>164</b>

### 3.3. Segregation and Containers Issues

As regards medical waste segregation, 60% of respondents stated that medical waste is segregated, while 12.8% denied the existence of segregation for medical waste at hospitals, whereas 26.8% do not know if there is segregation or not (Fig. 1). After deep question with health care staff, answers revealed that segregation applied only for sharp waste which is collected in special sharp boxes at the beginning after usage. Collection done first by medical staff then transported with other types of waste by cleaners. This explain the differences between answers among respondents about presence of medical waste segregation, and if it's identified or not as shown in Table 3, that most of them pointed to sharp box only, while the other types of health care waste collected with normal waste and disposed in the same containers. Transport of medical waste was made in plastic sacks as well as domestic waste disposed in the same kind of bags which is generally subject to tear in spite of being fastened properly, according to respondents answers which was between yeas its subjected to tears always (25%), sometimes (38 %), and rarely (19 %), despite its fastened always properly as maintained by (53%) of respondents, while (12%) said no, and (6%) do not know if sacks is subjected to tear. There are partially provisional measures to

prohibit liquids running out from waste, with 25% always, 17.5% sometimes and 10% stated that provisional measures to prohibit liquids running out from waste are rarely, while 22% of respondent were disapproved with and presence of any provisional measures to prohibit liquid running from waste, whereas and 25% of them don't have any idea about this issue. Health care waste segregation practice in this study was similar to some other developing countries, such as in Iran (Askarian et al., 2004), Jordan (Abdulla et al., 2008), Egypt (Soliman and Ahmed, 2007), Nigeria (Longo and Williams , 2006), in Karachi (Rasheed et al., 2005) , as well as to the local research results as two studies were applied in Palestinian governorates of Nablus (AL-khatib and Sato, 2009) and Gaza (Massrouji, 2001) perceptively, which revealed that segregation of all waste materials was not conducted according to definite rules and standards. From the other hand the local study of Shomar and Abed, (2013) emphasized that there was no bio-safety manual available at any of laboratories and that only 18.8% separate their hazardous wastes from the domestic one which raise the need for monitoring the medical waste separation and disposal. In contrast to the study results, the process of segregation of infectious waste in India was done in compliance with the Standard Procedures (Patil and Pokhrel, 2005).

### 3.4. Medical Waste Storage Issues

Results represented in Table 4, show that around 47% of respondents don't know where medical storage place is (Fig. 2), and don't know if there is mark to show place of storage, whereas 10% said there was no storage place; and 29% of them stated there is no special mark to show place of storage. In consistence 55% of respondents don't know if storage place inside hospitals is sufficient and 44% of them don't know if it's closed properly or protected well according to 45% of them. However, thirty four percent of (Al Awdah) the private hospital respondents do not know for how long, the medical waste used to be storage, while 54% of the governmental hospital (Al Shifa) confirmed that storage process is not applicable at the hospital. According to the other 36% of survey subjects, the maximum time period for medical waste storage is 1-2 days, while the maximum storage time has been 7 days. In 2001 medical waste of Primary Health Care PHC in Gaza Governorates was stored with domestic waste, while in the hospitals it was stored in the outdoors near incinerators (Massrouji, 2001). In Nablus – Palestine there is no special storage room for medical waste in the hospitals that, hazardous waste was sometimes stored in the same containers as the domestic waste, and there is no control measures existed for the management of these waste materials (AL-khatib and Sato, 2009). In Egypt (Soliman and Ahmed, 2007) some department store their biomedical waste inside the utility rooms such as surgical, medical, laboratory and intensive care units, while Labor, operating rooms and dialysis units do not store biomedical waste in the department, but the waste is immediately transported to the general storage area of the hospital which is located on the basement floor near to the exit door or near the incinerator. The mean period of storage for biomedical wastes in the storage areas of the healthcare setting was  $4.6 \pm 8.1$  days (Soliman and Ahmed, 2007). In Jordan, the study recommended the need for upgrading the internal and the external storage facilities to meet the MoH requirements, and the maximum time period for temporary storage is 12 hours, while the maximum storage time in central storage has been 2 days (Abdulla et al., 2008), as well as in India the medical waste bins were strictly placed away of patients and from nursing stations, also biomedical solid wastes were not stored for more than 18 hours offsite ( Patil and Pokhrel, 2005) . Also most of studied hospitals in Karachi have unsanitary waste storage areas (Rasheed et al., 2005).

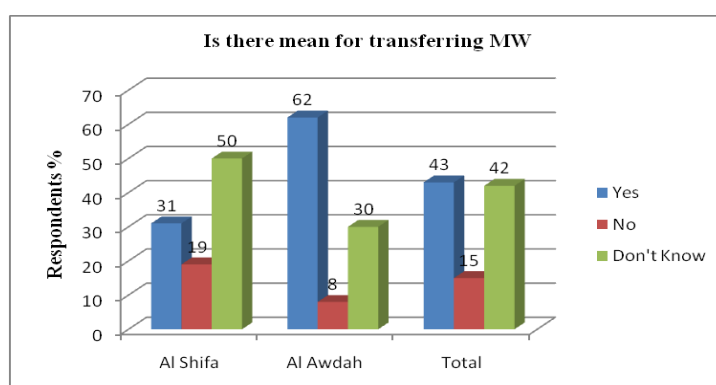
### 3.5. Medical Waste Transportation Issues

While 43% of respondents said there is mean for transferring medical waste, 42% of them said they don't know if it's there, and 43% don't know its type or if it's available always (Fig. 3). In comparison between Al Awdah as private hospital and Al Shifa as governmental hospital, 62% of the private hospital stated that there is mean for transferring medical waste and 44% confirmed that special medical waste is used at the hospital, 22% said it's common mean and around 30% don't know if it's there, whilst 50% of governmental hospital don't know if there is any mean for transferring medical waste, what its type, or if it's available. Also, 13% only mentioned that special medical waste is used at the hospital, and 18% said common mean is used, while 19% of them said it's not available. Regarding the person who is in charge of the matter of transferring mean, about 41% of workers with 44% and 38% from al Shifa and Al Awdah hospitals respectively don't know who is in charge of the matter of transferring mean, and 54% of them with 63% of Al Shifa and 41% of Al Awdah hospitals don't know if there is anyone cleans the transferring mean. About 70% of all respondents with minor differences between the two hospitals don't know if the waste transferring mean surface is smooth and 64% of theme with 68% and 58% of Al Shifa and Al Awdah subjects don't know if the waste transferring means permeable and liquids, Table 5. Medical waste was disposed of with domestic waste in PHC clinics of Gaza Governorates where municipality trucks collect medical and non medical waste together (Massrouji, 2001). In northern part of Palestine mainly in Nablus Governorate, hospital waste was collected by cleaning personnel who picked up the medical waste from different departments and transported it manually to a temporary storage area where the hospital waste was kept before being taken to the final disposal site as most of time general waste mixed with medical waste, and this area was poorly sanitized and not secure (AL-khatib and Sato, 2009).

In Egypt pilot study (Soliman and Ahmed, 2007), the department aid workers are usually responsible for biomedical waste collection and transportation; but those workers are not specially assigned for handling of waste, as they move wastes to the storage area of the hospital on a trolley or cart, which is not especially designed for this purpose. In Jordan collection and internal transportation in were carried out primarily by private contractors with little experience and who have a significant number of overturned containers, and most carts (95%) were yellow in colour with wheels and a lid (Abdulla et al., 2008).

**Table 5:** General investigation in MW Transportation

		Name of Hospitals		
		Al Shifa	Al Awdah	Total
<b>Is there mean for transferring medical waste?</b>	Yes	31 (31%)	40 (62%)	71 (43%)
	No	19 (19%)	5 (8%)	24 (15%)
	Don't Know	50 (50%)	19 (30%)	69 (42%)
<b>Type of transferring mean?</b>	Special Mean	13 (13%)	28 (44%)	41 (25%)
	Common mean	18 (18%)	14 (22%)	35(22%)
	Not Available	19 (19%)	4 (6%)	17 (10%)
	Don't know	50 (50%)	18 (28%)	68 (41%)
<b>Does Medical Waste transferring mean available always?</b>	Yes	18 (18%)	28 (44%)	46 (28%)
	No	18 (18%)	8(13%)	26(16%)
	Not Always	14 (14%)	6 (9%)	20(12%)
	Don't Know	50 (50%)	22 (34%)	72 (44%)
<b>Is it easy to control the transfer mean?</b>	Yes	27 (27%)	27 (42%)	54 (33%)
	No	11 (11%)	8 (13%)	19 (12%)
	Not Always	12 (12%)	10 (15%)	22 (13%)
	Don't Know	50 (50%)	19 (30)	69 (42%)
<b>Does anyone clean the transferring mean?</b>	Yes	18 (18%)	28 (44%)	46 (28%)
	No	19 (19%)	10 (16%)	29(18%)
	Don't Know	63 (63%)	26 (41%)	89 (54%)
<b>Who is in charge of the matter of transferring mean?</b>	Special worker	15 (15%)	22 (34%)	37 (22%)
	Workers	41 (41%)	18 (28%)	59(36%)
	Don't Know	44 (44%)	24 (38%)	68 (41%)
<b>Is the waste transferring mean surface smooth</b>	Yes	15 (15%)	13 (20%)	28 (17%)
	No	7 (7%)	0	7 (4%)
	Some how	7 (7%)	7 (11%)	14 (9%)
	Don't Know	71 (71%)	44 (69%)	115 (70%)
<b>Is the waste transferring mean permeable and liquids?</b>	Yes	16(16%)	3 (5%)	19 (11%)
	No	16 (16%)	24 (37%)	40 (24%)
	Don't Know	68 (68%)	37 (58%)	105 (64%)
<b>Total</b>		<b>100</b>	<b>64</b>	<b>164</b>

**Fig. 3:** Availability of Medical Waste Transferring Mean

#### 4. CONCLUSION

This study revealed that medical waste management have not received adequate consideration in both private and governmental hospitals, since there is inadequate and inefficient segregation, collection, transportation and storage of biomedical waste. In addition, lack of incinerators and low quality of operation and improper treatment of hazardous hospital waste. After deep question with health care staff, answers revealed that segregation applied only

for sharp waste which is collected in special sharp boxes at the beginning after usage. Collection done first by medical staff then transported with other types of waste by cleaners. This explain the differences between answers among respondents about presence of medical waste segregation, and if it's identified or not. A transport of medical waste was made in plastic sacks as well as domestic waste disposed in the same kind of bags which is generally subject to tear in spite of being fastened properly. Most of respondents don't know where medical storage place is, and don't know



if there is mark to show place of storage. Besides, training courses and awareness programs about medical waste management for health care providers and workers at hospitals were limited. Accordingly, the Ministry of Health (MoH) and healthcare institutions should pay more attention towards policies for the proper management and disposal of wastes to ensure enhancement and adequacy in the medical waste management practices. Additionally, there is need to be incorporated into regular worker training, continuing education, and management evaluation processes for systems and personnel.

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