

Accruing Practical Attitude and Knowledge by Biomedical Waste Disposals Regularly by Dental Practitioners

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ABSTRACT

Background: Dental health- care facilities should adopt strict rules and strategies for dental waste management to minimize the risk of transmission of the disease from the dental clinic to the community. Indiscriminate disposal of biomedical waste constitutes a massive risk to the general public health, health care workers, and patients.

Aim: This training purposes to evaluate knowledge, attitude, and practice between dental practitioners of different dental health sectors in Tanta city, Egypt. A cross sectional learning is showed in 200 working dentists in Tanta city. A self structured close-ended survey is utilized to get the essential information.

Results: The level of dental practitioners' awareness of BMW management policies ranged from 82.5% to 96%. Regarding BMW management practices, 90% of dental practitioners are conscious of the removal of various items into dissimilar color-coded bags. Dental practitioners of the private dental sector had the lowest correct responses (20%) regarding the disposal of used plastic items. Finally, 81.5% of dental practitioners settled must be steady instructive programs on biomedical waste management. Also, 80% of them accepted to receive training in any form on BMW

Conclusion: Based on The consequences of this learning is determined that despite high awareness level of dental practitioners in Egypt about BMW management policies, proper disposal of contaminated plastic items, impression material, and soiled dressings was not yet accurately implemented by dental practitioners. Also, dental practitioners lacked knowledge regarding the correct practice of safe disposal of excess mercury and treating infectious waste before disposal.

Keywords: Attitude, Practice, Biomedical, Waste, Knowledge, Dentist

INTRODUCTION

Recently, the remarkable improvement of dental technology and augmented convenience of dental healthcare facilities have is enhanced excellence of life of the community to pose a high risk to population health and sharing of environmental degradation due to the creation of a great amount of biomedical waste¹.

Biomedical waste (BMW) referred to any waste produced throughout treatment or vaccination of human beings or animals. So, dental waste is a risky division of BMW as dental practices produce large amounts of wastes contaminated with blood and body fluids such as cotton, latex, sharps, extracted teeth, and other materials. Moreover, dental office wastewater contains a high concentration of metal such as mercury, silver, tin, and copper produced from amalgam restoration and X-ray fixer solution².

According to Nakajima et al., 1996 dental health care facilities generated many types of wastes, the most dangerous types of dental wastes are hazardous and biohazardous waste. Firstly, Biohazardous wastes which contaminated with infective organisms' producing broadcast of diseases like Hepatitis B, C, and HIV to the individuals handling waste particularly in the attendance of open wounds. Secondly, Dangerous waste which contains metals such as silver, lead, mercury, X-rays films, and washing explanations are toxic and not ever degrades when they spread the atmosphere.

Consequently, every dental health-care facility should adopt strict rules and strategies for dental waste management to minimize the risk of disease transmission from the dental clinic to the community. These rules should be strictly shadowed at each single level of group, gathering, transport, storing,

treatment, and removal. Indiscriminate disposal of biomedical waste constitutes a massive risk to the general public health, health care workers, and patients³.

As stated by that universe wellbeing association (WHO), created nations generate up to 0.5 kg from claiming risky waste for every healing facility bunk for every day. Despite the fact that the measure to creating nations is best 0.2 kg for every healing facility bunk for every day, social insurance waste may be frequently not separated under dangerous alternately non-hazardous wastes, thus the real add up of unsafe waste significantly higher. Resembling numerous low-income countries, Egypt fights to enhance its clinic waste management polishes. In spite of the natural theory no. 4 about 1994 might have been conveyed should organize incorporated healing facility waste administration implementation, powers need aid neglecting on set up effective frameworks viewing segregation, collection, exchange or treatment, due to feeble authoritative enforcement⁴.

In Egypt, the elevated awareness about dental treatment among the public increased the number of dental healthcare facilities and the amount of biomedical waste generated together with cumulative global consciousness around biomedical waste management and related dangers. Therefore, the current study was conducted to access and compare information, attitude, and practice of biomedical waste disposal among dental practitioners of different dental sectors in Tanta city, Egypt⁵.

MATERIAL AND METHODS Study design

This research was carried out as a evocative cross-sectional learning.

Sample selection

The sample of this study is randomly selected from the dental practitioners in Tanta city who were distributed into four sectors; educational, ministry of health, insurance, and private sector. The sample excluded non-practicing dentists and dentists with an administrative job only⁶.

Example size control

The example size is intended by means of the Epi-Info program, version 6, with predictable incidence of satisfactory information, attitude and practice score 74% at α error = 0.05 and power of the test = 80%. This produced a example size of 200 dentists⁷.

According to the proportion of dental practitioners inside each dental health sector, a proportionally biased example is occupied as surveys 80 dentists from the ministry of health, 40 dentists from the faculty of dentistry, 20 dentists from the insurance sector, and 60 dentists from private sectors.

Approval from the Research Ethics Committee, Faculty of Dentistry, Tanta University was secured before the start of the learning. Oral consensus is gained since members after clarifying the learning purposes and promising information concealment. To reserve privacy, the questionnaire is unidentified and information is kept intimate in a file that might be retrieved individual by the authors⁸.

Survey tool

Data collection is completed by the assistance of a organized, self-administered, close-ended survey. It was handed to the participants during evening clinic hours. The questionnaire originally developed by Narang RS et al; 2012 with some modifications. A pilot study was conducted among a sample of 10 dentists to pre-test the questionnaire to insure reliability and comprehensibility. Cronbach's alpha test showed the reliability coefficient of 0.89 and was found satisfactory for conducting the study⁹.

The pretested questionnaires were included in the final study. Those To begin with and only those questionnaires held inquiries regarding those demographic profile of the participants, same time the second a component assessed knowledge, Attitude, What's more act (KAP) at biomedical waste management for sixteen inquiries. Of the sixteen questions, those To begin with three inquiries evaluated dental practitioners' information What's more mentality viewing BMW administration approaches. Those following eight inquiries evaluated those learning of BMW oversaw economy polishes and the A five inquiries assessed those participants' mindfulness Furthermore instruction

viewing BMW management10.

Those questionnaires might have been administered of the members Toward those writer for legitimate educational. Ace graph Furthermore coding rundown were arranged in the recent past entering the information et cetera those gathered information might have been entered under the workstation through Microsoft exceed expectations Sheet11.

Data is exchanged to SPSS for measurable dissection. A Chi-square test might have been connected will look at the middle of right reactions got starting with dental professionals in distinctive dental parts. P-value ≤ 0. 05 might have been recognized statistically critical.

Results

The demographic outline of study participants obtained from different dental health sectors of Tanta city showed that (60%) were males and (40%) were female. The majority of dental practitioners (66%) were general practitioners and (34%) were specialists. Among the respondents (56.5%) were practicing forthe past 5 years, (27.5%) were practicing for 6–10 years and (16%) had experienced more than 10 years. (Table 1)

Table1: Demographic profile of the participating dental practitioners

Characteristics		No	Total
Gender	Male	120 (60%)	200
	Female	80 (40%)	
Level of education	BDS	132 (66%)	200
	MDS	59 (29.5%)	
	PHD	9 (4.5%)	
Practicing Since	0-5ys	113 (56.5%)	200
	6-10ys	55 (27.5%)	
	>10ys	32 (16%)	

Table 2 revealed a statistically significant difference in information concerning administration guidelines on waste management and waste management policy (p < 0.05). The highest correct responses (95% and 96.25% respectively) were found in dental practitioners of the ministry of health. Meanwhile, no difference was found in knowledge concerning the responsibility for the safe organization of biomedical waste between dental practitioners of different dental health sectors with 96% total correct responses¹². In general, the level of dental practitioners' awareness of BMW management policies ranged from 82.5% to 96%.

Table2: Information and arrogance concerning BMW organization policies between dental practitioners of different dental health sectors

Survey question		Different Dental Health Sectors					χ ²	P-value
		Educational (n= 40)	Ministry of health (n= 80)	Insurance (n= 20)	Private (n= 60)	Total (n=200)		
guidelines laid down by Government for BMW management	Correct	35 (87.5%)	76 (95%)	14 (70%)	45 (75%)	170 (85%)	20.380	<0.05*
	Incorrect	5 (12.5%)	4 (5%)	6 (30%)	15 (25%)	30 (15%)		
Waste management policy in hospital/clinic	Correct	38 (95%)	77 (96.25%)	18 (90%)	32 (53.33%)	165 (82.5%)	36.52	<0.05*
	Incorrect	2 (5%)	3 (3.75%)	2 (10%)	28 (46.67%)	35 (17.5%)		
Responsibility for the safe management of BMW	Correct	39 (97.5%)	78 (97.5%)	17 (85%)	58 (96.67%)	192 (96%)	2.63	>0.05
	Incorrect	1 (2.5%)	2 (2.5%)	3 (15%)	2 (3.33%)	8 (4%)		

Regarding BMW management practices, 90% of dental practitioners are conscious of the removal of various items into dissimilar color-coded bags. Though, the alteration is not important between dissimilar dental sectors ($p>0.05$). The highest incorrect responses among dental practitioners were found in the disposal of used plastic items, impression material, and soiled dressings (68.5%& 65.5%) respectively¹³.

Table 3: Information and arrogance on BMW performs between dental practitioners of different dental health sectors

Survey question		Different Dental Health Sectors					χ^2	P-value
		Educational (n= 40)	Ministry of health (n=80)	Insurance (n= 20)	Private (n= 60)	Total (n=200)		
Are different colored bags used?	Correct	36 (90%)	75 (93.75%)	18 (90%)	51 (85%)	180 (90%)	3.54	>0.05
	Incorrect	4 (10%)	5 (6.25%)	2 (10%)	9 (15%)	20 (10%)		
Disposal of plastic item	Correct	15 (37.5%)	27 (33.75%)	9 (45%)	12 (20%)	63 (31.5%)	18.45	<0.05
	Incorrect	25 (62.5%)	53 (66.25%)	11 (55%)	48 (80%)	137 (68.5%)		
Disposal of impression material, soiled dressings	Correct	16 (40%)	24 (30%)	8 (40%)	21 (35%)	69 (34.5%)	4.75	>0.05
	Incorrect	24 (60%)	56 (70%)	12 (60%)	39 (65%)	131 (65.5%)		
Disposal of sharps, needles	Correct	37 (92.5%)	75 (93.75%)	17 (85%)	49 (81.67%)	178 (89%)	7.98	>0.05
	Incorrect	3 (7.5%)	5 (6.25%)	3 (15%)	11 (18.33%)	22 (11%)		
Disposal of extracted teeth, human tissue	Correct	39 (97.5%)	76 (95%)	18 (90%)	52 (86.67%)	185 (92.5%)	6.87	>0.05
	Incorrect	1 (2.5%)	4 (5%)	2 (10%)	8 (13.33%)	15 (7.5%)		
Disposal of excess mercury	Correct	11 (27.5%)	24 (30%)	6 (30%)	11 (18.33%)	52 (26%)	16.42	<0.05
	Incorrect	29 (72.5%)	56 (70%)	14 (70%)	49 (81.67%)	148 (74%)		
Wearing protective barriers during handling of BMW	Correct	37 (92.5%)	76 (95%)	18 (90%)	55 (91.67%)	187 (93.5%)	2.32	>0.05
	Incorrect	3 (7.5%)	4 (5%)	2 (10%)	5 (8.33%)	13 (6.5%)		
treating infectious waste before disposing of them	Correct	15 (37.5%)	34 (38.75%)	13 (65%)	12 (20%)	74 (37%)	20.85	<0.05
	Incorrect	25 (62.5%)	46 (61.25%)	7 (35%)	48 (80%)	126 (63%)		

Of all dental sectors, the dental practitioners of the private dental sector had the lowest correct responses (20%) regarding the removal of used plastic substances and the difference is statistically important ($p<0.05$). On the other side, the majority of dental practitioners (93.5%) agreed to wear gloves and mask while handling BMW¹⁴. (Table3) Furthermore, the correct practice responses of dental practitioners regarding the disposal of contaminated needles and extracted teeth were (89%&92.5%) respectively and the difference was not statistically significant. On the other hand, the correct responses concerning the disposal of excess mercury and treating infectious waste before disposal¹⁵ were (26%&37%) respectively and there is a statistically important alteration ($p<0.05$) among the different dental sectors. The dental practitioners of the private sector exhibited the highest incorrect responses (81.76%&80%) among all study participants. (Table3).

Table 4: information and boldness on BMW consciousness between dental practitioners of different dental health sectors

Survey question		Different Dental Health Sectors					χ^2	P-value
		Educational (n= 40)	Ministry ofhealth (n=80)	Insurance (n= 20)	Private (n= 60)	Total (n=200)		
health hazards with improper waste management	Correct	38 (95%)	78 (97.5%)	19 (95%)	57 (95%)	192 (96%)	5.86	>0.05
	Incorrect	2 (5%)	2 (2.5%)	1 (5%)	3 (5%)	8 (4%)		
Maintained BMW records in your hospital/clinic	Correct	35 (87.5%)	74 (92.5%)	17 (85%)	33 (55%)	159 (79.5%)	32.54	<0.05
	Incorrect	5 (12.5%)	6 (7.5%)	3 (15%)	27 (45%)	41 (20.5%)		
Generation of biomedical waste in hospital/clinic	Correct	34 (85%)	58 (72.5%)	15 (75%)	48 (80%)	155 (77.5%)	2.54	>0.05
	Incorrect	6 (15%)	22 (27.5%)	5 (25%)	12 (20 %)	45 (22.5%)		
regular educational programs on biomedical management needed	Correct	38 (95%)	77 (96.25%)	16 (80%)	32 (53.33%)	163 (81.5%)	30.85	<0.05
	Incorrect	2 (5%)	3 (3.75%)	4 (20%)	28 (46.67%)	37 (19.5%)		
received training on BMW management	Correct	37 (92.5%)	73 (91.25%)	15 (75%)	36 (60%)	161 (80.5%)	36.74	<0.05
	Incorrect	3 (7.5%)	7 (8.75%)	5 (15%)	24 (40%)	39 (19.5%)		

Concerning the education and awareness of BMW, nearly all dental practitioners (96%) agreed that biomedical waste causes health hazards and 77.5% of them believed that dental clinics generate biomedical waste. However, there was no statistical difference was found between different dental sectors ($p>0.05$).

Moreover, 79.5 of dental practitioners approved that maintaining BMW records in their clinics was mandatory. Finally, 81.5% of dental practitioners Settled that there ought to a chance to be general instructive projects on biomedical waste management16. Also, 80% about them acknowledged on accept preparation for whatever type for BMW, which might have been statistically critical for p -value < 0. 05 (Table4)

Discussion

Nowadays, one of the serious threats to the environment and human health is the haphazard disposal of biomedical waste. so, Correct management for biomedical wastes incorporates dynamic support and harmonization the middle of governmental Also non-governmental organizations, those dental institutions, and the social insurance personnel17.

Egypt as An Creating particular nation needed an lack for solid decides and regulations to those isolation What's more proper oversaw economy from claiming BMW. Henceforth this Scrutinize pointed will assess the knowledge, attitude, What's more act about biomedical waste administration around an assembly for dental professionals On Tanta city with recognize those holes between the current KAP Around the health-care specialists included in waste administration and the future wanted state that ought be reached18.

This cross-sectional investigation might have been directed for a predesigned Also pretested self-administered questionnaire which analyzes those learning What's more mentality in regards BMW management policies, practices, and mindfulness around dental professionals. Just about every last one of inquiries were of a closed end sort with dodge whatever review bias, not difficult on analyze, Also accomplish a snappier reaction from members.

In this study (60%) of dental practitioners were males and (40%) were female which in the same line

with studies done by Farmer GM et al., 1997 and Radha Ket al.,2009.Also, (66%) were general practitioners and (34%) were specialists in contrast to the study done by Sood AG &Sood A,2011 where 47% were graduates and 53% were postgraduates¹⁹.

Among the respondents of this study (56.5%) were practicing dentistry for the past 5 years, (27.5%) were practicing for 6–10 years, and (16%) had experienced more than 10 years. This is nearly like to the learning done by Bansal et al.; 2013 where 60% of the topics required those learning for <5 years; 28% needed knowledge <5–10 a considerable length of time What's more 12% needed experience for more than 10 a considerable length of time.

In the exhibit study, the level for dental professional's consciousness something like BMW oversaw economy approaches went from 82. 5%to 96%which will be in understanding with the investigation carried out Toward Singh t et al. ;2018[21]who evaluated the familiarity with biomedical waste management over dental understudies from claiming various dental universities of nepal What's more they found that the greater part of the dental scholars needed An certain state of mind towards administration strategies of biomedicalwaste²⁰.

Also, in the same line of our results, the study was done by Sushma MK et al.;2010who evaluated the awareness level of policy related to waste management in private dental clinics in India and they found that a high percentage of dental practitioners were aware of the legislative policy.

In contrast to the present results, Kishore J et al.; 2000 assessed the awareness level about BMW management between dentists of a teaching hospital, and they revealed that the mainstream of the participant was not aware of the correct clinical waste management regulations. This disparity of results may be attributed to the different survey sampling methodology and size.

Concerning BMW management practices, the current results showed that 90% of dental practitioners were aware of the disposal of various items into different color- coded bags which agreed with the study done by Narang RS et al; 2012. While only 27.4% of dental practitioners in a study investigated the disposal of dental waste in Bangkok were aware of this practice²¹.

In respect to the disposal of used plastic items, impression material, and soiled dressings 65.5%- 68.5% of the participants were unable to respond correctly that the disposal of used plastic items should be in a red-colored bag which agreed with the study done by Bangennavar BF et al., 2015. However, in a study conducted by in Indian hospitals revealed 100% correct responses by all participants. It was returned to the training that the team received in their hospital.

Furthermore, the correct practice responses of dental practitioners regarding the disposal of contaminated needles and extracted teeth were (89%&92.5%) respectively which is similar to the result obtained by Arora et al., 2014 and unlike the results of the study done by Singh et al., 2012[30]&Asgad A et al.,2014who found that a small percentage of dental practitioners (25.5%) use safety boxes for sharps andneedles²².

Only 26% of dental practitioners in this study dispose of the excess mercury; simply by storing it in a closed container with a photographic fixer to reduce its hazard and facilitate its recycling. This was consistent with the results of done by Os among et al., 2005and Arora et al., 2014.

On contrary, a study by Singh T et al.,2018 revealed a maximum awareness of dental students regarding disposal of mercury (79.8%-97.9%) which may be owed to the detailed explanation of dental amalgam in the subject of dental materials, which is educated during the first year of a dental program. The present results which is corresponding to the results of Singh T et al., 2018 discovered that (93.5%) of dental practitioners were aware of using protective barriers while handling BMW. This illustrated that dentists were aware of dental waste generated in day-to-day dental practices which need special consideration, as they are health hazard items. However, only 37% of dentists be familiar with treating BMW before disposing of them²³.

Concerning the education and awareness of biomedical waste management, nearly all dental practitioners (96%) agreed that biomedical waste causes health hazards and 77.5% of them believed that dental clinics generate biomedical waste. However, there was no statistical difference was found between different dental sectors ($p>0.05$). Moreover, 79.5% of dental practitioners approved that maintaining BMW records in their clinics was mandatory. In the same line, 81.5% of dental practitioners settled That there ought to be standard instructive projects for biomedical waste administration Also 80% of them acknowledged with accept preparing clinched alongside any manifestation looking into BMW, which might have been statistically critical with p -value $< 0. 05$. Lastly, to the instruction and familiarity with biomedical waste management, it might have been found that the larger part from claiming dental professionals in distinctive dental parts about Tanta city required a certain attitude²⁴.

These outcomes were near investigations carried out Eventually Tom's perusing Radha r et al. , 2012; Chaudhari et al. , 2015and Malini et al.,2015.

CONCLUSIONS

Based on the consequences of this learning, it can be determined that despite the high awareness level of dental practitioners in Egypt about BMW management policies, proper disposal of contaminated plastic items, impression material, and soiled dressings was not yet accurately implemented by dental practitioners. Also, dental practitioners lacked knowledge regarding the correct practice of safe disposal of excess mercury and treating infectious waste before disposal.

It is recommended that dental practitioners should receive intensive educational programs and training in biomedical waste management to improve their practices. The authoritative bodies in Egypt should effectively implement the rules and guidelines with regular audits to improve dental waste management practice.

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