

AWARENESS AND KNOWLEDGE ABOUT DENTAL BIOMEDICAL WASTE MANAGEMENT AMONG HEALTH CARE WORKERS OF GUJARAT, INDIA

MEGHA L VYAS^{1*}, ASHIT BHARWANI², HARSH BAXI², SHIVANG PATHAK¹

¹Department of Dentistry, GMERS Medical College and Hospital, Gotri, Vadodara Gujarat, India. ²Department of Dentistry, Parul Institute of Medical Sciences and Research, Parul University, Vadodara, Gujarat, India. Email: meghavyas11111@gmail.com

Received: 15 July 2022, Revised and Accepted: 25 August 2022

ABSTRACT

Objective: The aim of this study was to assess the knowledge, attitudes, and practices related to medical waste management (MWM) among healthcare workers in clinics.

Methods: The introduced study was an enlightening cross-sectional study. A self-directed poll was intended to record age, sex, kind of training, long stretches of training, extra preparation, information and practices on risky dental waste and information, and practice of security measures against cross-disease. The review populace included dental specialists and other medical services laborers of our emergency clinic. No data were accessible about the information on dental specialists with respect to the board of dangerous waste. From each state on India, Health-care laborers were chosen haphazardly from the rundown. A self-controlled poll was asked to the 200 medical care laborers. Overall response rate was 63% (n=200). Identity of the respondents was kept confidential.

Results: A total of 200 questionnaires were distributed. Returns were 150 questionnaires with 55% males and 45% females. Only 42% of respondents were aware of the existence of guidelines of waste management. From this study, it was found that majority of study populations were not aware about the management of biomedical waste.

Conclusion: Our study showed that although the attitude toward biomedical waste management was highly positive among students and they understood the importance of managing hazardous waste, the knowledge and practice still have scope for improvement. Regular monitoring and training are required at all levels for the management of hazardous dental wastes. Waste management program should be a part of academic curriculum and continuing dental education.

Keywords: Awareness, Knowledge, Biomedical waste

© 2022 The Authors. Published by Innovare Academic Sciences Pvt Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>) DOI: <http://dx.doi.org/10.22159/ajpcr.2022v15i11.45551>. Journal homepage: <https://innovareacademics.in/journals/index.php/ajpcr>

INTRODUCTION

Clinical waste is created by medical care offices, for example, clinics, facilities, blood donation centers, and laboratories, which might make contamination any individual coming into contact with it. This might comprise completely or incompletely of human or creature tissue, blood or other body liquids, discharges, medications or drug items, swabs or dressings, needles, and needles or other sharp instruments. It is squander which except if delivered safe might demonstrate unsafe to any individual coming into contact with it [1,2]. Therefore, clinical waste can be considered as one of the best ecological worry since it can hold onto possibly hurtful microorganisms and conveys the gamble of transmission of diseases from medical services offices to medical care laborers, patients, and overall population. To forestall hurtful outcomes to the human well-being, the local area, and the climate, appropriate medical waste administration medical waste management (MWM) is required, which involves overseeing waste from their age, through division, assortment, transport, and treatment, to their last removal [3,4]. In many emerging nations, MWM is not as expected completed, and there are no plainly characterized guidelines and an absence of functional principles [5,6]. It has been accounted for that the removal of clinical waste blended in with civil strong waste is probably going to happen in centers because of the little amount of clinical waste produced, the significant expense of assortment and removal, and an absence of implementation from the neighborhood specialists.

The main aspect of study was to identify the level of awareness and knowledge regarding biomedical waste management among healthcare workers of Vadodara city, Gujarat, at the primary level of dental professional training, which actually elucidate the level of teaching about this important aspect.

METHODS

The presented study was a descriptive and cross-sectional study conducted at Dental department of Parul Institute Medical science and Research, Vadodara, Gujarat, from January 2020 to January 2021.

A self-controlled poll was intended to record age, sex, kind of training, long stretches of training, extra preparation, information and practices on dangerous dental waste and information, and practice of well-being measures against cross-contamination.

The review populace included dental specialists and other medical services laborers of our emergency clinic. No data were accessible about the information on dental specialists with respect to the executives of perilous waste. From each state on India, health-care laborers were chosen arbitrarily from the rundown. A self-regulated survey was asked to the 100 medical services laborers.

Overall response rate was 63% (n=200). Character of the respondents was kept secret.

Survey information was placed into a PC and broke down by factual programming (SPSS 12.0). The precision of information was checked by entering it 2 times with resulting correlation of two informational indexes. No errors were tracked down in the information.

RESULTS

A total of 200 questionnaires were distributed. Returns were 150 questionnaires with 55% males and 45% females. Only 42% respondents were aware of the existence of guidelines of waste management.

Table 1: Knowledge on recommend method and actual practices of amalgam disposal among respondents

Method Name	Recommended management %	Method Name	Actual practiced management %
Under water	35	Under water	50
Special waste disposal site	25	Special waste disposal site	0
Sewage	0	Sewage	7
General waste	0	General waste	18
Did not know	22	Did not respond	12
Under sodium thiosulfate	13	Under sodium thiosulfate	8
Under developer	2	Under water	2
Burn/incinerate	5	Burn/incinerate	3

Table 2: Knowledge on recommend method and actual practices of developer and fixer disposal among respondents

Method Name	Recommended management %	Method Name	Actual practice management %
Silver collected from fixer and stored in separate container but developer flushed in drain	52	Silver collected from fixer and stored in separate container but developer flushed in drain	3
Fixer can be flushed in drain	6	Fixer is flushed in drain	13
Developer can be flushed in drain	17	Developer is flushed in drain	32
Fixer and developer mixed and flushed in drain	25	Fixer and developer mixed and flushed in drain	42

Table 3: Practice of waste disposal methods

Method Name	Recommended management %	Method Name	Actual practice management %
Incineration	75	Incineration	55
Sterilization	4	Sterilization	2
Burn	8	Burn	30
Sewage	5	Sewage	8
Did not know	8	Did not know	5

Table 4: Disposal of pathological waste

Method Name	Recommended management %	Method Name	Actual practice management %
Disinfect	5	Disinfect	8
Bury	3	Bury	3
Incineration	55	Incineration	55
Burn	15	Burn	5
General waste container	22	General waste container	29

Developer, fixer, and lead foils

In this study, it was observed that 55% of dental specialists were utilizing customary radiography, and 32% were utilizing both ordinary and computerized. About 52% of dental specialists in our review suggested that silver is gathered from fixer and put away in discrete compartment to arrange to guaranteed organization albeit by and by, just 3% followed. 13% were depleting the fixer into the channel, 32% were depleting the waste designer into the channel, and 42% were by and by that spent engineer and fixer arrangements are blended and flushed into the channel (Table 1).

Mercury and amalgam

In our review, 30% of the respondents utilized amalgamator to blend mixture, 60% mixed physically, though 12% were not utilizing combination by any means. About 36% utilized pre-typified mixture and 60% put mass mercury in the amalgamator. In this overview, 5% were arranging mercury into the channel, 30% into the dustbin, and 49% were putting away the overabundance mercury in glycerin and water.

About 60% of respondents were controlling mixture with ungloved hands. 69% did not utilize elastic dam while putting or eliminating blend reclamations and 26% did not utilize high-vacuum pull while dealing with combination in mouth. About 36% of dental specialists were utilizing cotton to hold abundance Hg spilled on the floor, and 42% utilized solid paper to pick it. About 47% of dental specialists knew about mixture separators and just 10% members had separator introduced at their work environment.

On the dangerous impacts of blend, 82% of respondents demonstrated that mixture is harmful whenever arranged inappropriately anyway just 10.7% showed contamination as an outcome of ill-advised removal of combination. About 77% did not have the foggiest idea about the risky impact of ill-advised removal of mixture. About 25% said that they did not have the foggiest idea how to arrange off combination. Overall, there was a disparity among information and practice for removal of amalgam. About 30% of the respondents demonstrated that mixture ought to be overseen by submerged capacity. Half really put away overabundance blend submerged. Different strategies included general waste (18%), sodium thiosulfate (8%), and sewage (5%). About 12% did not demonstrate how they discarded squander blend (Table 2).

Body waste

Every one of the respondents knows the gamble of cross-contamination with ill-advised removal of horrendous waste. Anyway there was an inconsistency among information and practice. However, 75% showed that cremation was the suggested strategy for removal. Just 55% burned these materials. About 8% did not have the foggiest idea about the suggested technique for removal. About 30% of respondents working on consuming to arrange these waste (Table 3).

Pathological wastes

About 82% of respondents said that cross-disease can be a result of inappropriate administration of obsessive waste. About 29% of respondent arranged off neurotic waste as broad waste (Table 4).

Sharp

Just 35.5% of the respondents demonstrated that sharps could be perilous if inappropriately made due. About 64.3% demonstrated that cross-contamination was a potential gamble of ill-advised administration of sharps. About 71% of respondents demonstrated that cremation was the suggested method of managing sharps. Be that as it

may, just 61% of respondents burned sharps. 19.5% discarded sharps in a sharp compartment while 4.9% arranged them with general waste.

Disinfectants

In this survey, 66% of the participants were using disinfectants for cold sterilization, out of which 72% were flushing them into drain.

DISCUSSION

Amazing proportion of biomedical waste is made in dental practices, which can be hazardous to the environment, too in regards to individuals who associate with these materials, if not oversaw Suitably [7]. According to the WHO truth sheet, generally 20% of waste created by various clinical consideration units is represented to be hazardous [8]. Rapid urbanization and people improvement have provoked progressively more number of clinical centers and classified offices. With the development in clinical consideration workplaces, it comes the time of abundance proportion of biomedical waste.

The more troublesome situation in the future could arise in view of the destructiveness and unavailability of dumping justification for such wastes.

In thickly populated non-modern countries, the leading group of biomedical waste is a perplexed issue and should be organized early. Stress over the appearance of ozone exhausting substances during incineration of biomedical waste has moreover evolved, which finally causes environmental harm and overall warming [9]. Many assessments from arising countries have been kept in the composing showing lack of data and devastated attitude among clinical benefits workers with respect to biomedical waste. These assessments have been represented from India [10,11], Brazil [12], Dhaka [13], and Turkey [14]. These examinations were for the most part revolved around biomedical waste organization, at this point did not look at reusing of waste. There are no assessments definite in India regarding the cognizance of biomedical waste organization among dental students going through planning.

As American Dental Association rules for genuine evacuation of combination waste, mix should be taken care of freely in different compartments named with a "biohazard" picture. Seat side catches and vacuum siphon channels should be used to wipe out the mix particles from the wastewater stream. Anyway, some combination particles really go into the sewer structure. Mix separators should be used to dispense with blend waste particles absolutely in dental office discharge [15,16]. Mercury and silver present in combination wastes should be recovered through a refining cycle and sent for reusing.

Despite dental blend, the most notable wellspring of coordinated significant metals in dental office is lead from lead foil and lead shields. Lead cannot be set in the standard solid waste compartments nor could it anytime be disposed of down the channel; it ought to be regulated as either recyclable metal or hazardous waste. Lead foils should be accumulated in discrete compartment and compensated the producer or waste dealer for reusing. X-bar photo manufactured substances (fashioner, fixer, and cleaning plans) in like manner contain significant metals. The used fixer should be assembled freely in a named plastic holder. Silver from used fixer is a significant source and should be reused. Waste specialist can be flushed into the divert considering the way that the hydroquinone is consumed during taking care of and becomes nonhazardous.

From this survey, it was seen that majority of study masses had close to zero insight into the organization of biomedical waste. This is in understanding to studies done by Sreegiri *et al.*, Mathur *et al.*, and Sood and Sood where the care was very less about biomedical waste organization [17,18]. According to a survey done by Narang *et al.*, a more significant level of focusing on individuals, basically 89%, had barely any familiarity with biomedical waste organization [19]. This shows the general thoughtlessness among clinical benefits workers with respect to this issue.

Dangers of not recommended organization of biomedical waste have extended the stressed all through the world, considering its pernicious ramifications for human prosperity and climate. Improper trash expulsion by centers, nursing homes, and clinical consideration foundations has extended the stress over this. In the ongoing survey, it was seen that as a huge part of the clinical consideration workers were clueless about the six fruitful steps for genuine trash evacuation or the sort of incinerator used and the harmful gases made from these incinerators that adds to extra an extensive temperature help. Same results have been represented by Babu in his review on organization of biomedical waste. Makers have underlined the sincere prerequisite for preparing about the risks of biomedical waste to the clinical consideration workers [20].

CONCLUSION

Our study showed that although the attitude toward biomedical waste management was highly positive among students and they understood the importance of managing hazardous waste, the knowledge and practice still has scope for improvement. Regular monitoring and training are required at all levels for the management of hazardous dental wastes. Waste management program should be a part of academic curriculum and continuing dental education.

AUTHORS CONTRIBUTION

All authors have intellectual contribution to the work

CONFLICTS OF INTEREST

No conflicts of interest.

AUTHORS FUNDING

None.

REFERENCES

1. Government of India. "Bio-Clinical Waste (The Executives and Taking Care of) Rules". The Periodical of India. Service of Environment and Forest; 1998.
2. National Rules on Hospital Squander the Executives. Biomedical Waste Guidelines; 1998.
3. Public AIDS Control Association. Manual for Control of Clinic Related Diseases. Standard Employable Systems. Public AIDS Control Association; 1999. p. 50-66
4. Environmental Guidelines and Best Administration Rehearses; 2012. Available from: <https://www.crd.bc.ca>
5. Panchanuwat DK, Treasures BK. An examination of the removal of dental clinical waste in Bangkok. *Int Dent J* 1998;48:369-73.
6. Treasure BK. Examination of the removal of risky waste from New Zealand dental practices. *Community Dent Oral Epidemiol* 1997;25:328-31.
7. Aeronautical Development Agency. Best Management Practices for Amalgam Waste; 2007. Available from: <https://www.ada.org> [Last accessed on 2009 Dec 03].
8. Dental mercury hygiene recommendations. ADA council on scientific affairs. *J Am Dent Assoc* 1999;130:1121-3.
9. ADA Council on Scientific Affairs. Dental mercury hygiene recommendations. *J Am Dent Assoc* 2003;134:1498-99.
10. Baghele ON, Phadke S, Deshpande AA, Deshpande JP, Baghele MO. A worked on model for biomedical waste administration in dental practices-a pilot project at Thane, India. *Eur J Gen Dent* 2013;2:235-40.
11. Ghasemi MK, Yusuff RB. Benefits and disadvantages of healthcare waste treatment and disposal alternatives: Malaysian scenario. *Pol J Environ Stud* 2016;25:17-25.
12. Mathur P, Patan S, Shobhawat AS. Need of biomedical waste management system in hospitals-an emerging issue. *Curr World Environ* 2012;7:117-24.
13. Mattoo K, Singh V, Garg R. Are dental training programs heading towards ecological disaster-results from a survey. *J Atmos Pol* 2014;2:17-21.
14. Sharma A, Sharma V, Sharma S, Singh P. Familiarity with biomedical waste management among health care personnel in Jaipur, India. *Oral*

- Health Dent Manag 2013;12:32-40.
15. Thota MM, Bathala LR, Theruru K, Shaik S, Jupidi B, Rayapati S. There's a lot of room at the base: The biomedical waste administration in dentistry. J Dr. NTR Univ Health Sci 2014;3:149-55.
 16. Mathur V, Dwivedi S, Hassan MA, Misra RP. Information, disposition and practices about Bio-medical squander the executives among medical services work force: A cross-sectional study. Indian J Community Med 2011;36:143-5.
 17. Sood AG, Sood A. Dental viewpoint on biomedical waste and mercury the board: An information, demeanor and practice study. Indian J Dent Res 2011;22:371-5.
 18. Sreegiri S, Babu GK. Bio-medical squander the executives in a tertiary level medical clinic in Visakhapatnam. Indian J Community Med 2009;5:1-6.
 19. Narang RS, Manchanda A, Singh S, Verma N, Padma S. Attention to biomedical waste administration among dental experts and assistant staff in Amritsar, India. Oral Health Dent Manag 2012;11:162-8.
 20. Babu BR, Parande AK, Rajalakshmi R, Suriyakala P, Volga M. The executives of Biomedical waste in India and other countries: A review. J Int Environ Appl Sci 2009;4:65-78.