

Knowledge, practice and attitude of dental care waste management among private dental practitioners in Latur city

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Abstract

Introduction: Oral health is one of the important aspects of overall general health. The Oral health care is provided by the means of several modalities which leads to the generation of the biomedical waste. The management of the same is considered as an important aspect to avoid hazards of the same to the humans. The aim of the present study was to evaluate the knowledge, attitude and practices of dental care waste management among private dental practitioners in Latur city.

Materials and Method: The present cross sectional study was conducted among 48 private practitioners practicing in Latur city. The prefabricated validity tested questionnaire was used for the present study. The results were formulated using chi-square tests.

Results: Amongst the total respondents 77.08% were males and 22.92% were females while 27.08% were postgraduates and 72.92% were undergraduates. In the present study, only 20% of undergraduate practitioners knew about ten categories of biomedical waste mentioned by ministry of environment and forest. Only half i.e. 50% practitioners knew that contaminated sharps should be disposed in blue/white colored container. The total no. of 33.3% of dentists directly dispose infected needles in common bin.

Conclusion: In the present study it has been observed that the most of the practitioners had acceptable knowledge about biomedical waste management but they fail to apply that in their practice. Hence legislations and implementation of various programs will certainly give better effect along with practitioner's positive attitude.

Keywords: Biomedical Waste, Waste management, Dental practice.

Introduction

Dental diagnostic and treatment modalities require various chemicals, radiological materials, materials like Silver amalgam and needles that are used in treatment of diseases etc. Piling up of these disposable items produce biomedical wastes. These wastages may or may not always be hazardous to health. However, some of these materials, drugs, chemicals as well as human anatomical tissues pose a risk of causing harm or infections to subjects exposed to them. The term biomedical waste is defined as "any waste that is generated during diagnosis, treatment or immunization of human beings or animals, or in the research activities pertaining to or in the production or testing of biological, and includes categories mentioned in Schedule I of the Government of India's BMW (Management and Handling) rules 1998."⁽¹⁾ It is estimated that annually about 0.33 million tones of biomedical waste are generated in India.⁽²⁾ EPA has estimated that about 5.1 tones of mercury can be intercepted if mercury separators were installed in dental offices in America.⁽³⁾ These materials can be hazardous and can lead to certain bacterial as well as viral infections such as HBV, HIV⁽⁴⁾ and toxicities. To avoid such kind of hazardous situations, it is important to have proper storage and disposal of such biomedical waste material according to the rules and act.⁽⁵⁾ With this background, the study was conducted to evaluate knowledge, attitude and practice of dental care waste management among private dental practitioners in Latur city, Maharashtra.

Materials and Method

The present cross-sectional survey was carried out among the private practitioners in Latur city between the months of March and April 2016. List of private dental practitioners was obtained by Indian Dental Association, Latur Branch.

Out of 82 practitioners in the list, 48 practitioners had showed interest in participating in survey. Inclusion criteria were decided as He/she must be registered dentist who must be practicing in Latur city and ready to give consent.

Exclusion criteria were

1. Time limit to get questionnaire back and
2. Those who were unwilling to participate.

The prefabricated validity tested questionnaire was distributed in target population. Initial part of questionnaire contained questions on personal and professional data including name (optional), age, sex, designation and years of experience. While further part contained 16 questions on evaluation of knowledge, practice and attitude regarding dental care waste management.

The questionnaire was in English language and asked to return as they finished after distribution among dentists.

All collected questionnaires were coded and analyzed. The chi-square test is performed on it and level of significance was set on $p < 0.05$.

Results

Assessment of Profiles of Respondents: In the present study, out of total 48 respondents 37 were males and 11 were females. 12 were postgraduate while remaining 36 were graduates.

This demographic data of respondents is explained in Table 1.

Table 1: Profile of respondents

| | | n | % |
|---------------------------|--------------|----|-------|
| Variable gender | Male | 37 | 77.08 |
| | Female | 11 | 22.91 |
| Educational qualification | Postgraduate | 12 | 33.33 |
| | Graduate | 36 | 66.66 |

Table 2: Response to the knowledge based questions

| Questions | Options | Number | % |
|---------------------------------------------------|------------------------|---------------|----------|
| Aware of different categories of biomedical waste | Yes | 35 | 72.9 |
| | No | 6 | 12.5 |
| | Don't know | 7 | 14.6 |
| | Total | 48 | 100.0 |
| | Options | Number | % |
| Categories of biomedical waste has been mentioned | 9 | 6 | 12.5 |
| | 10 | 13 | 27.1 |
| | 12 | 3 | 6.2 |
| | Don't know | 26 | 54.2 |
| | Total | 48 | 100.0 |
| | Options | Number | % |
| Colour coding to be employed in waste disposal | Yes | 41 | 85.4 |
| | No | 2 | 4.2 |
| | Don't know | 5 | 10.4 |
| | Total | 48 | 100.0 |
| | Options | Number | % |
| Yellow coloured bag/ container is for | Human anatomical waste | 34 | 70.8 |
| | Sharp waste | 2 | 4.2 |
| | Chemical waste | 3 | 6.2 |
| | Don't know | 9 | 18.7 |
| | Total | 48 | 12.5 |
| | Options | Number | % |
| Sharps should be disposed in | Yellow container | 3 | 6.2 |
| | Red container | 6 | 12.5 |
| | Blue/White container | 24 | 50 |
| | Don't know | 15 | 31.3 |
| Total | 48 | 100 | |

Table 2 explains the responses to the knowledge based questions. About 72.9% of subjects were aware of different categories of biomedical waste mentioned by ministry of environment and forest of India. Only about 27.1% of subjects knew about number categories of biomedical waste mentioned and majority of them i.e. 54.2% not opted to answer this question. Significant p value 0.047 had observed with this question in analysis among educational qualification comparison as stated in Table 3.

Table 3: Distribution of population on the basis of educational qualification on their knowledge of categories of biomedical waste mentioned in literature

| Options | MDS | BDS | Chi square value | p value |
|------------|-----|-----|------------------|---------|
| 9 | 3 | 3 | 7.23 | 0.047* |
| 10 | 6 | 7 | | |
| 12 | 1 | 2 | | |
| Don't know | 3 | 23 | | |
| Total | 13 | 35 | | |

About 85.4% of subjects knew about different color coding to be employed in waste disposal. 70.8% subjects knew that yellow colored bag or container is for human anatomical waste while half of subjects

knew that sharps should be disposed in blue or white color container.

Table 4 shows distribution of attitude based questions among target population. The responses showed almost positive attitude towards management of biomedical waste but there was neutral response for the question regarding if safe management of health care waste is an extra burden on work. There were no significant responses observed in accessible variables.

Table 5 gives data regarding practice based questions. It is very commendable thing that about 93.8% of dentists segregate different types of wastes in their clinics while when it comes to disposal of infected needles only few i.e. 27.1% dentists use needle burner for disposal. Most of them i.e. 33.3% use common bin for disposal of infected needles. Significant p value = 0.048 is seen in gender variables when it comes to disposal of infected needles as shown in Table 6. Most of the dentists, about 41.7% collect excess mercury in air tight container with water and same amount of dentists dispose developer or fixer solution by diluting it with water. It is seen that majority of dentists i.e. 87.5% use private biomedical wastage service for collection of biomedical waste from their clinics. About 45.8% of dentists are well aware of fact that how this collected biomedical waste gets disposed.

Discussion

In the present study, 14.6% of dental practitioners were unaware of different categories of waste generated in dental clinics which is surprisingly similar to the study conducted by Mohit Bansal et al. in 2013⁽⁷⁾ in which 14% of dental practitioners did not aware of different categories of waste generated in the dental office while 11.1% of practitioners were not aware of different categories of waste in study conducted by Sudhir et al. in 2006.⁽⁸⁾

In present study, 52.4% of dental practitioners didn't know the number of biomedical waste categories mentioned as per biomedical waste management act 2016. 18.7% of practitioners failed to answer correctly; while only 19% dentists knew ten categories of biomedical waste in study done by Bangennavar BF et

al in 2015.⁽⁹⁾ It shows the desperate need of dentists to keep updated themselves with current knowledge in the field.

33.3% of them disposed the needles directly into common bin after use. This is in accordance with the study done by Mohit Bansal et al. in 2013 in which 14% of surveyed population disposed needles in common bin after use. In another similar study conducted by Kaushal Chaudhari et al. in 2015; 11.5% of post graduates didn't know in which color bag needles should be discarded.⁽¹⁰⁾ This shows high negligence or very low knowledge of practitioners regarding the same as disposing into common bins is not safe method for needles after use.

In the present study, 22.9% of dentists disposed excess silver amalgam into common bins which was found to be lower in contrasts to the study conducted by Sudhakar et al. in 2008 in which 35.2% of dentists disposed excess silver amalgam in common bins⁽¹¹⁾ as well as than that of study conducted by Mohit Bansal et al. in 2013; in which 44% of dentists disposed silver amalgam into common bin which may lead to the substantial threat of the hazardous conditions.

Almost all i.e. about 95.8% of dentists showed interest in attending programs that enhance and upgrade knowledge of biomedical waste management, voluntarily. This showed positive outcome of the study and promising increase in the percentage than the studies done by Kaushal Chaudhari et al. in 2015 and by Sanchit Pradhan et al. in 2015 in which percentage was 88.6% for postgraduate dentists and 63.6% of dentists respectively who wanted to attend program involuntarily.⁽¹²⁾

Conclusion

The present study showed that dentists in the city of Latur had an average knowledge about the biomedical waste management which they failed to project into practice. However, positive attitude towards the dental biomedical waste management shows that implementation of knowledge programs and minor legislations may lead to the better and safe future.

Table 4: Response to the attitude based question

| Questions | Options | Number | % |
|---------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------|----------|
| Do you have license/ certificate from authorized local government organization/ committee for proper biomedical waste disposal? | Yes | 40 | 83.3 |
| | No | 2 | 4.2 |
| | Don't know | 6 | 12.4 |
| | Total | 48 | 100.0 |
| Safe management of health care waste is not an issue at all | Options | Number | % |
| | Strongly Agree | 18 | 37.5 |
| | Agree | 13 | 27.1 |
| | Neutral | 6 | 12.5 |
| | Disagree | 5 | 10.4 |
| | Strongly disagree | 4 | 8.3 |

| | | | |
|---------------------------------------------------------------------------------------------------------------------|-------------------|---------------|----------|
| | Don't know | 2 | 4.2 |
| | Total | 48 | 100 |
| | Options | Number | % |
| Safe management of health care waste is an extra burden on work | Strongly Agree | 5 | 10.4 |
| | Agree | 13 | 27.1 |
| | Neutral | 11 | 22.9 |
| | Disagree | 13 | 27.1 |
| | Strongly disagree | 6 | 12.5 |
| | Total | 48 | 100 |
| | Options | Number | % |
| Do you think, its necessary to collect biomedical waste in separate color coded bags or containers? | Yes | 38 | 79.2 |
| | No | 8 | 16.7 |
| | Don't know | 2 | 4.2 |
| | Total | 48 | 100 |
| | Options | Number | % |
| Will you like to attend voluntarily programs that enhance and upgrade you knowledge of biomedical waste management? | Yes | 46 | 95.8 |
| | No | 0 | 0 |
| | Don't know | 2 | 4.2 |
| | Total | 48 | 100 |

Table 5: Responses to practice based questions

| Questions | Options | Number | % |
|-------------------------------------------------------------|------------------------------------------|---------------|----------|
| Do you segregate different types of wastage in your clinic? | Yes | 45 | 93.8 |
| | No | 2 | 4.2 |
| | Don't know | 1 | 2.1 |
| | Total | 48 | 100.0 |
| | Options | Number | % |
| How do you dispose infected needles? | Dispose in common bin | 16 | 33.3 |
| | Break needle and dispose in common bin | 15 | 31.2 |
| | Dispose needle in needle burn | 13 | 27.1 |
| | None | 4 | 8.3 |
| | Total | 48 | 100 |
| | Options | Number | % |
| How do you store excess silver amalgam? | In common bin | 11 | 22.9 |
| | In air tight container with water | 20 | 41.7 |
| | In fixer | 6 | 12.5 |
| | Do not use | 9 | 18.8 |
| | Don't know | 2 | 4.2 |
| | Total | 48 | 100 |
| | Options | Number | % |
| How do you dispose developer and fixer? | In wash basin | 13 | 27.1 |
| | Dilute it and dispose | 20 | 41.7 |
| | Others | 1 | 2.1 |
| | Do not use | 11 | 22.9 |
| | Don't know | 3 | 6.2 |
| | Total | 48 | 100 |
| | Options | Number | % |
| Where do you collect biomedical waste from your clinic? | Municipal Biomedical wastage service van | 3 | 6.2 |
| | Private Biomedical wastage service van | 42 | 87.5 |
| | Self | 0 | 0 |

| | | | |
|-----------------------------------------------------------------------------------|----------------|---------------|----------|
| | None | 2 | 4.2 |
| | Don't know | 1 | 2.1 |
| | Total | 48 | 100 |
| | Options | Number | % |
| If you don't do it by yourself, do you know how biomedical wastage gets disposed? | Yes | 22 | 45.8 |
| | No | 16 | 33.3 |
| | Don't know | 10 | 20.8 |
| | Total | 48 | 100.0 |

Table 6: Distribution of population on the basis of gender for disposal of infected needles

| Options | Male | Female | Chi square value | p value |
|----------------------------------------|------|--------|------------------|---------|
| Dispose in common bin | 14 | 2 | 8.831 | 0.048* |
| Break needle and dispose in common bin | 13 | 2 | | |
| Dispose needle in needle burn | 9 | 4 | | |
| None | 1 | 3 | | |
| Total | 37 | 11 | | |

Limitation of study

As this study was confined to the only single city but this topic is relevant to large regional area so more extensive studies with larger and broader population cohort are required for better assessment and implementation of biomedical waste guidelines.

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