

A Protocol Of Systematic Review To Evaluate Knowledge, Attitude And Practice Regarding Biomedical Waste Management Among Dental Teaching Institutions And Private Practitioners In Asian Countries

Priyanka Tompe¹, Neelam Pande¹, Bhushan Kambhale², Usha Radke¹

ABSTRACT

1- Department of Prosthodontics, VSPM Dental College and Research centre, Nagpur 440019

2- Senior Resident, Department Of Community Medicine, AIIMS, New Delhi.

Address for Correspondence:
Dr. Priyanka

Department of Prosthodontics, VSPM Dental College and Research Centre, Nagpur 440019.

Background: Proper segregation and disposal of biomedical waste is global concern in today's era. Knowledge of updated biomedical waste management guideline is utmost importance among dentists of teaching institutions and private practitioners for prevention of cross-infection and transmission of infectious diseases among health care professions.

Objective: The objective of present study is to assess knowledge, attitude and practices among dental teaching institutions and private practitioners in Asian countries
Materials and Methods: Systematic review of observational studies on Biomedical waste management will be conducted. We will search the following electronic bibliographic databases: PubMed/MEDLINE, Cochrane Library, Science Direct, Willey Online Library, Google Scholar. Manual search will be carried out for similar topics in National Medical library, New Delhi. Only studies written in English will be included. Studies published till February 2019 will be included. The searches will be re-run just before the final analyses and further studies retrieved for inclusion. The primary outcome is to assess the Knowledge of biomedical waste management (BMWM) among various government and private dental practitioners. Study selection will follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Guidelines (PRISMA).

Ethical issues: As it will be a systematic review, without human beings involvement, there will be no requirement for ethical approval. Findings will be disseminated widely through peer-reviewed publication and in various media.

Prospero Trial Registration Number[CRD42019124900](#).

Keywords: Biomedical waste management, Knowledge, attitude, dentists, Asia

INTRODUCTION:

Dental Medical colleges and clinics are those institutions which have existed since long time in various forms and are increasing more rapidly since last decade. This increase in dental institutions resulting tremendous increase in biomedical waste generated by these settings. Biomedical waste is defined as any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals or research activities pertaining thereto or in the production or testing of biological or in health

camp, including the categories mentioned in Schedule I appended to these rules.¹

Dental waste is a subset of hazardous biomedical waste (BMW) which includes various materials like soaked cotton, sharp needles, extracted teeth, human tissue parts, and so forth, which are usually contaminated with body fluids like blood and saliva.² Dental institutions also generate other types of waste, like mercury, silver amalgam, and various chemical solvents.³ Amalgam and its waste products need to be strictly regulated otherwise it may lead to environmental pollution as well occupational hazard.⁴ Waste generated in a dental teaching hospital is similar to that generated by other hospitals which include a large

component of general waste and a smaller proportion of hazardous waste.

According to study conducted in Bangalore, total quantity of waste generated was 0.161 kg/dental clinic/day with 0.130 kg and 0.026 kg of infectious and recyclables waste, respectively.⁵ Dental professionals are also at a greater risk for acquiring cross-infection while treating patients. This is evident from the fact that most of the human pathogens have been isolated from oral secretions. Dental hospitals use instruments and materials that are directly exposed to blood and saliva and are therefore potential sources of infection.

As per Biomedical waste management rules put forth by government colour coding should be followed while disposing waste generated in dental institutions. Health care establishments are responsible for segregation, disinfection and disposal in eco-friendly manner.¹ Dentists are therefore expected to be aware with these waste management regulations, also they are expected to follow these regulations to ensure their safe disposal for maintenance of safe and healthy working environment.

Most of the surveys carried out on the biomedical waste management in India have been on general and private dental practices but very limited studies have been done on dental teaching institutions which generate a considerable amount of biomedical waste. The present systematic review is aiming to assess status of biomedical waste management among dentists of Indian as well other Asian countries working in private clinics or dental teaching institutions. This will help us to understand broad picture of waste management awareness and practices among dentists and recommend necessary steps to improve it.

Therefore the present systematic review is being carried out on the available literature to report-

- Knowledge, awareness and practice regarding biomedical waste management among dental teaching institutions and dental practitioners in Asian countries.
- To suggest possible remedial measures if required.

MATERIAL AND METHODS:

Eligibility Criteria for the studies:

This systematic review will be carried out on knowledge, attitude and practice regarding biomedical waste management among dental teaching institutions and private practitioners in Asian countries.

Following will be inclusion criteria: [1] Studies conducted in Asia; [2] Subjects limited to dental health care practitioners working in dental teaching institutions and private clinic in Asian countries; [3] Published in English language; [4] Studies evaluating the knowledge, awareness and practice regarding biomedical waste management as outcome measures; [5] Observational studies. No limitation in terms of publication date will be considered in the search strategy.

The studies that will be excluded from the present review: [1] Studies not conducted in Asia; [2] Reviews; [3] Studies which are not in English language, [4] Protocols of published studies.

Initial electronic and manual search for KAP of BMW management among dentist will be carried out. Search strategy consisting MeSH terms and key words will be used for extracting data by electronic and manual search in National Medical Library, New Delhi and Dental Institute library, will be carried out. The current systematic review protocol is registered in Cochrane's International Prospective Register of Systematic Reviews (PROSPERO registration number is CRD42019124900.) (<https://www.crd.york.ac.uk/PROSPERO/#recordID=124900>).

Identification of relevant studies:

The present review of literature will be carried out both electronically as well as manually. The present review will be carried out based on PRISMA guidelines. Relevant literature search will be carried out through computerized literature searches of PubMed/Medline, Cochrane Library, Science Direct, Willey Online Library, Google Scholar and manual search irrespective of the date of publication using MeSH terms. We will use following search strategy: (medical waste disposal) OR biomedical waste) OR dental waste) AND knowledge attitude practice) OR knowledge) OR attitude) OR practice) OR KAP) AND "Dentists"[Mesh]) OR dental students) OR dental teaching institution) OR dental practitioner.

Studies conducted among Asian countries will be filtered and abstract will be explored by two independent authors (PT and NP). Various key words that will be utilized in search strategy include- biomedical waste, dental waste, knowledge, attitude, practice, dental teaching institutions, dental students, dental practitioners. Various combinations of key words were made using 'and', 'or' as Boolean operators. Experts in the concerned field and authors of selected studies will also be contacted for obtaining missing or unclear data whenever deemed essential.

Selection of studies:

Two authors [PT and NP] will independently identify studies that will be included in the present review. Initially, titles and abstracts of the records retrieved by the search will be assessed in order to exclude those studies that are inappropriate. Reviews will not be not included though their reference lists will be searched in turn for any studies not retrieved by the electronic search. For the remaining studies, full text articles will be recovered that met the inclusion criteria. Selected studies will be screened using STROBE checklist for observational studies.

Collection and extraction of data:

This review will be done according to the guidelines set forth by Preferred Reporting Items for Systematic Reviews and Meta-Analyses [PRISMA].⁶ Two of the authors [PT & NP] will be given the responsibility of extracting data from the studies. Pre-specified data will be extracted from each of the studies including the study design, sample size, biomedical waste management practices among the study subjects, awareness and knowledge regarding disposal of biomedical waste in their institution and other study characteristics. Any kind of disagreement regarding article screening and extraction will sorted out by discussion with other authors (BK and UR)

Control of Bias Assessment:

Following issues will be included in the risk of bias or quality assessment in the present systematic review: (1) Completeness of reporting information regarding biomedical waste management, (2) Selective outcome reporting, (3) Choice of outcome measures [knowledge or awareness levels, practices adopted during management of biomedical waste], (4) Study design, and (5) Conflict of interest in the conduct

of the study. When all criteria will meet, the overall plausible risk of bias will be low.

DISCUSSION:

One of the strengths of the proposed study is to apply a reproducible and transparent procedure for systematic review of the literature. In this protocol, we clearly describe the types of studies, participants, interventions and outcomes that will be included, as well as the data sources, search strategy, data extraction methods (including quality assessment) and methods of combining data. By publishing the research protocol, we reinforce the clarity of the strategy and minimize the risk of bias, namely selective outcome reporting.

The results shall provide high-level information regarding awareness and practice of segregation and disposal the biomedical waste generated in dental settings. Potential limitations of this study include the heterogeneity of measures and outcomes evaluated which may negatively influence the statistical power in data synthesis. This review will focus on awareness of dentists regarding recent biomedical waste guidelines and its implication for prevention of infections and safety of medical as well paramedic staff. This review will demonstrate the value of the involvement of the dentists in management of biomedical waste and keep working environment free from any occupational hazards.

AMENDMENTS:

Any amendments to this protocol will be documented with reference to saved searches and analysis methods, which will be recorded in bibliographic databases and End Note.

DISSEMINATION:

The results of the review will be disseminated in an open access journal to ensure access for undergraduate and graduate students, researchers, academics and research groups and also will be disseminated in various media, such as: conferences, seminars, congresses or symposia.

FUNDING: Nil

COMPETING INTERESTS: None declared.

PATIENT CONSENT FOR PUBLICATION:

Not required.

REFERENCES:

1. Government of India. Biomedical waste (Management and Handling) Rules, 2016. Extraordinary, Part II, Section 3, Sub-section (i). The Gazette of India. 2016 March; No.343.
2. Sharma A, Sharma V, Sharma S, Singh P. Awareness of biomedical waste management among health care personnel in Jaipur, India. *Oral Health and Dental Management*. 2013;12(1):32–40.
3. Khandelwal V, Khandelwal S, Thakur JS. Health care waste disposal among private dentist in an Indian city: It's time to act. *International Journal of Infection Control*. 2013;9(2):20-23.
4. Charania ZK, Ingle NA. Awareness and practices of dental care waste management among dental practitioners in Chennai city. *International Journal of Contemporary Dentistry*. 2011;1(1):15–21.
5. Krishnappa P, Sreekantaiah P, Hiremath SS, Thapsey H, Shivraj NS, Murthy NS. Quantification of Dental Health Care Waste Generated among Private Dental Practices in Bengaluru City. *J Int Oral Health*. 2015 Jun;7(6):84-7.
6. Liberati A, Altman DG, Tetzlaff J, Mulrow C, Gotzsche PC, Ioannidis JP et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions. Explanation and elaboration. *J Clin Epidemiol*. 2009;62:e1-34.