

## Original Research Article

# Knowledge and practice of Biomedical Waste (BMW) Management among the medical practitioners of Kanchipuram Town, India

Kokila Selvaraj, P.Sivaprakasam, B.T.Sudhir Ben Nelson, G.H.Midhun Kumar\*, Prasan Norman and K.R.Pandiyan

Department of Community Medicine, Meenakshi Medical College & Research Institute, Enathur, Kanchipuram, Tamil Nadu- 631552, India

\*Corresponding author

## ABSTRACT

### Keywords

Biomedical Waste; knowledge; Practice; Medical Practitioners; general waste.

Bio medical waste, in addition to the risk for patients and medical personnel, also poses a threat to public health and environment. To assess the existing Knowledge and Practice of BMW among the general practitioners in Kanchipuram town, a Descriptive Cross sectional study was conducted using pre-tested structured questionnaire. The study showed that 70% of the practitioners have not undergone any orientation / training in BMW management. Though most (98%) felt that BMW should be segregated, 36.2% of them were still dumping it with general waste. Knowledge about the correct method of BMW management was insufficient. In our study 61% don't know what ultimately happens to the BMW. There is need for programs that not only impart knowledge to the Doctors but also motivate them to actively practice, proper bio-medical waste management.

## Introduction

Biomedical waste could be defined as “any solid, fluid or liquid waste, including its container and any intermediate product, which is generated during the diagnosis, treatment or immunisation of human beings or animals, in research pertaining thereto, or in the production or testing of biological and the animal waste from slaughter houses or any other like establishments” (AFMC, 2009). WHO estimated that 80% of the total health care waste is not infectious and only 20% is infectious or poses risk of injury AND

and is hazardous to human beings (WHO 2005). The waste generated in hospitals in addition to the risk for patients, doctors, nursing staff, and personnel who handle these wastes (housekeeping, sanitary workers) poses threat to public health and environment. The hazards of exposure to bio-medical waste can range from gastroenteritis, respiratory and skin infections to more deadly diseases such as HIV /AIDS and hepatitis. It is source of contamination of land and water sources, if not rendered harmless before its burial on land or disposal in water. It emits harmful gases which lead to atmospheric

pollution when treated by open burning or burning in incinerators (Rao, 2008). In India, 2 million new hepatitis B cases, 4 million new hepatitis C cases and 30000 HIV positive cases occur every year due to needle prick injuries (Singh, 2004). Private medical practitioners in rural areas are known to use injections and IV fluids to large extent (Ashtekar *et al.*, 2004). Unsafe practices such as reuse of syringes (with or without sterilization) and multi dose vials increase the risk of blood borne viral diseases.

In developing countries like India the waste is carried to the outskirts of the city and dumped indiscriminately in a most insanitary way. In addition to this, new health care institutions are built without any consideration for waste handling and management.

An evaluation report submitted by Indian Institute of Management, Lucknow commissioned by central Pollution Control Board, showed that only 50 -55% of Bio-Medical waste generated in the country is being properly segregated, transported & disposed. The rest usually ends up with the general waste. It is estimated that annually about 0.33 million tonnes of hospital waste is generated in India and, the waste generation rate ranges from 0.5 to 2.0 kg per bed per day (Patil and Shekdar, 2001). The Ministry of Environment and Forests, Government of India created the Biomedical Waste (Management and Handling) Rules, which came into effect on 20th July 1998 to mitigate the impact of hazardous and infectious hospital waste on the community. The absence of proper waste management, lack of awareness about the health hazards from biomedical wastes, insufficient financial and human resources, and poor control of waste disposal are the most critical problems

connected with healthcare waste.

Adequate knowledge about the health hazards of hospital waste, proper technique and methods of handling the waste, and practice of safety measures can go a long way towards the safe disposal of hazardous hospital waste and protect the community from various adverse effects of the hazardous waste.

In corporate hospitals, Medical college hospitals or large Government hospitals there is dedicated set of staff starting from the managerial cadre who are responsible for Bio-waste Management. But in case of small private nursing homes & clinics, the responsibility of proper waste management falls on the doctor in-charge of the facility. Unless these doctors possess the proper knowledge, and apply them in practice, the Bio-medical waste in small towns like Kanchipuram will remain a threat to public health. Hence a study aimed to assess the Knowledge & Practice regarding Bio Medical Waste Management among Medical Practitioners in Kanchipuram town, Tamilnadu, India was undertaken.

## **Materials and Methods**

A Descriptive Cross sectional study was undertaken among the medical practitioners in Kanchipuram town, Tamilnadu, India. After the pilot study, a Questionnaire consisting of 21 items was framed. One day training program was conducted for post graduates regarding data collection. A list of members of the Indian Medical Association (IMA) Kanchipuram, augmented by the Kanchipuram BSNL telephone directory was used as the sample frame. Under the supervision of one Professor, data collection was done by 4 postgraduates.

Two teams of two post graduates each collected data for 2 weeks during October 2012 from 113 medical practitioners. Kanchipuram town area was divided into 4 regions and each team covered 2 regions. After explaining the objective of the study, the Questionnaire was administered to each medical practitioner.

## **Results and Discussion**

Among the 113 medical practitioners approached, there were 8 non respondents. The main reason given was that, they do not generate much of medical waste (Eg. Ophthalmologists). Data were collected from 105 medical practitioners in Kanchipuram town. In our study 72 practitioners (68.5%) had postgraduate qualification. 55 % (58) of them were general practitioners while the rest of them were practicing their specialty.

Many of the doctors (40%) were treating on an average 25-50 patients/day. Only 30.5% of the practitioners in Kanchipuram had undergone some training on Bio-Medical Waste Management and 69.5% had no training which is similar to study done at Delhi where 88% had no training (Sumi, 2010)

Cotton, needles and empty vials were the most common bio-medical waste generated. Others include intra venous sets and body fluids like vomitus, urine & motion specimens, placenta & organs (Fig 1).

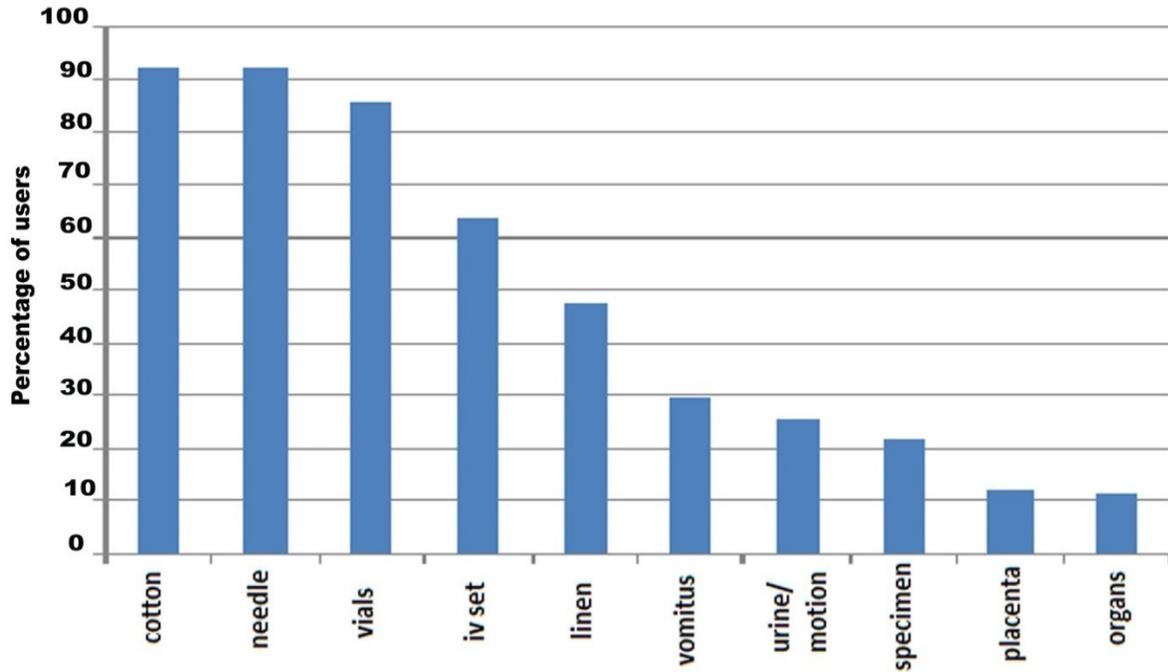
Knowledge on bio-medical waste was assessed by questions focused on identification of colour coding and the symbol of Bio-waste and knowledge about legislation on bio-medical waste management. A set of 6 questions asking the respondent to match the waste with the

appropriate colour code, was used to assess the Knowledge regarding colour coding. Only 59% of the practitioners were able to answer more than 3 questions correctly. 62% of the doctors were able to identify the symbol for Bio Medical Waste correctly whereas in a study done at Bangalore 86% of them correctly identified the symbol (Madhukumar and Ramesh, 2012). In our study 75% were aware that some Acts and Rules are in existence for Bio- Medical Waste management but in study done in Delhi only 46% were aware of legislation (Sumi, 2010). Similarly study done by Hanumantha Rao reported that only 55% of private practitioners aware about Bio Medical Waste (Management and Handling) rules of (Rao, 2008).

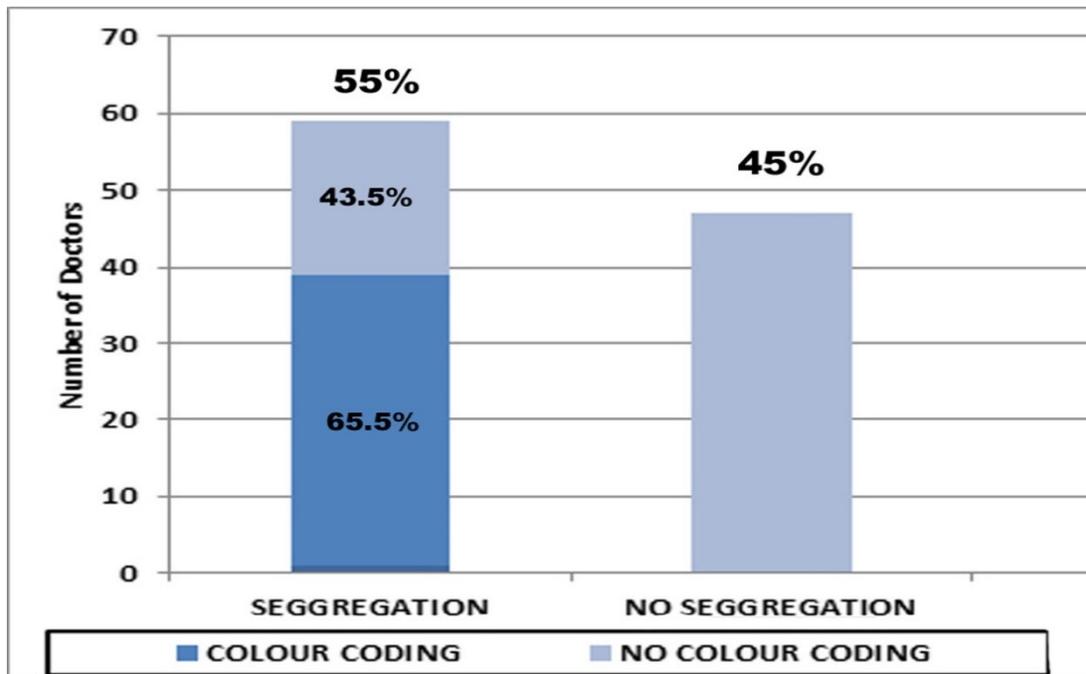
Our study revealed that only 55% (n=58) of the practitioners segregated waste at the point of generation, of whom 65.5% used colour coding while the rest have their own system of segregation (Fig: 2). Practice of segregation Bio Medical Waste was less in our study when compare to the study done by . Hanumante Rao (70%) (Rao, 2008). Most of them (44%) used 3 different types of containers for the segregation of bio medical waste in their hospital or clinic. Interestingly study done in Lahore in one private and one public hospital showed that the segregation and colour coding of BMW were 100%. (Mahmood *et al.*, 2011).

63% of the Medical practitioners were using closed containers for collection of Bio-waste, while the rest were using open containers (plastic baskets or bags). 58% of hospital and clinics were not using needle destroyer regularly to dispose of the needles (Fig: 3)

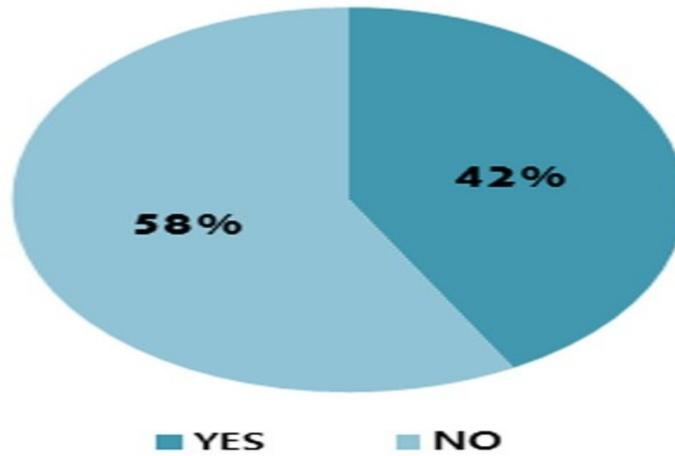
**Figure 1:: Type of Bio medical waste**



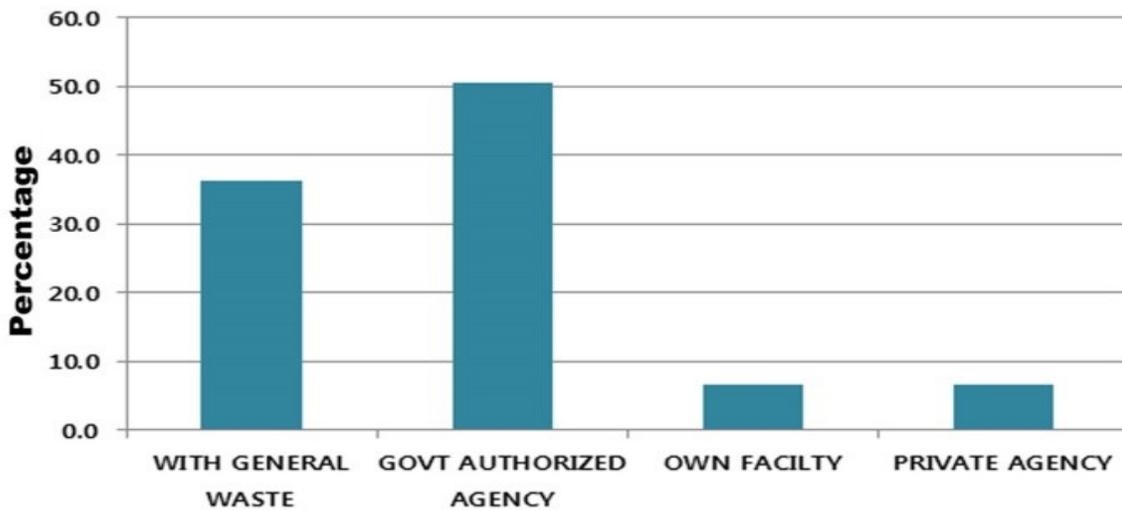
**Figure: 2:: Segregation at source & colour coding**



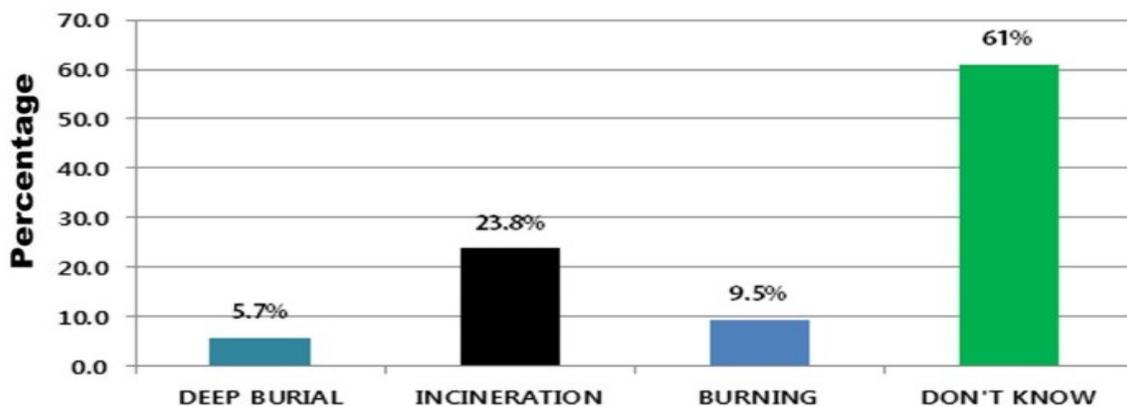
**Figure: 3:: Use of Needle Destroyers**



**Figure: 4 :: Disposal of BMW**



**Figure: 5 :: Ultimate fate of the Bio-waste**



When it comes to frequency of waste disposal, 75% of the practitioners were disposing waste daily while the rest did it once or twice a week. It was informed that this irregularity of disposal is due the small amount of medical waste generated in some clinics.

Regarding the transportation of BMW among 58 medical practitioners who segregate the bio-medical waste 44 respondents (75.8%) said that the waste was collected from the facility for transport in plastic bags. Of the rest, 9(15%) selected closed containers, one by open container. Surprisingly 4 of them did not know anything about the collection and transportation process.

Though 50.5% of the hospitals and clinics were availing the services of the Government authorized private agency (Tamilnadu Waste Management Limited), it is unfortunate that 36.2% of them were still disposing the Bio medical waste along with general waste( Fig: 4). Rest of them either had their own facility or used the services of some unauthorized private agencies. Unfortunately 61% of the doctors had no idea about what ultimately happens to the waste generated in their facility (Fig 5).

98% of the respondents felt that it is important to segregate the Bio Medical Waste at point of origin. Fortunately 67.6% of them said that they discuss about the need for proper Bio-Medical Waste Management with their colleagues, which may lead on to better bio-medical waste management among them.

### **Recommendations**

Biomedical waste management rules should be followed in all hospitals and clinics.

The acts and rules should be accompanied by social science approach of motivation and change of attitude among medical practitioners. All medical practitioners should be trained on bio medical waste management at accredited training centres.

### **References**

- AFMC. 2009. Text Book of Public Health and Community Medicine, 1<sup>st</sup>Edn (Chief Ed: Rajvir Bhalwar)., Pub: Department of Community Medicine, AFMC, Pune.pp.688
- Ashtekar, S., D. Mankad and Raimane, K. 2004. Child mortality determinants in three backward districts of Maharashtra 2003–2004, Nandurbar, Jalna and Yavatmal. Mumbai: Indira Gandhi Institute of Development Research.
- Madhukumar, Suwarna and Ramesh, G. 2012. Study about awareness and practices about health care waste management among hospital staff in a medical college hospital, Bangalore. *Inter. J.Basic. Med.Sci.*3(1):7 – 11.
- Mahmood, Shahid, Najam-ud-Din, Jibran Mohsin and Hassan Javed. 2011. Practices Regarding Hospital Waste Management at Public and Private Sector Hospitals of Lahore, *Ann. Kemu.* 17(2): 113 -115.
- WHO, 2005. Management of Solid Healthcare Waste at PrimaryHealthcare Centres - A Decision-Making Guide. GenevaV.
- Patil, A.D., and Shekdar, A.V. 2001. Health-care waste management in India. *J. Environ.Manag.* 63: 211–220.
- Rao., and Hanumantha. P. 2008. Report: Hospitals waste management – awareness and practices: a study of three states in India. *Waste Manag. Res.* 26(3) : 297 (2008)
- Singh, R., 2004. Biomedical Waste, Toxics Link Fact Sheet, Number 20, Srishti/Toxics Link, New Delhi.
- Sumi, and Nandwani, 2010. Study of Biomedical waste management practices in a private hospital and evaluation of the benefits after implementing remedial measures for the same. *J. Commun. Dis.* 42 (1): 39-44.