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BIO MEDICAL WASTE MANAGEMENT AWARENESS AMONG HEALTH CARE
PROFESSIONALS: SURVEY OF MEDICAL CENTERS OF CHHATTISGARH
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ABSTRACT

In any civilization many things are essential, some are optional and are some luxury but one thing is common that it has a life and after the useful life it turns to waste. These wastes either deadly, wasteful or has no value either way. The medical wastes and particularly the bio medical wastes are deadly ones. The deadly waste handling needs proper handling and here comes the awareness and level of knowing the threats. . The Bio Medical Waste is one among such. The handler group or set of persons involved in it more prone to come in contact and is at maximum risk. This group needs to be highly alert and aware about the risks of deadly contamination from which they may get affected. The present study of growing state or region study reveals that the best know how group i.e. Doctors level of awareness is high but the minimal group which is ignorant is highly risking factor as ill effect is that the group is somewhat quack and not proper educated or training doctor. The aware set ir also required to be further careful.. The least aware group i.e.Ward boys and Sanitary group persons who are more likely to get contamination are mobile and least educated group more susuptable to the threats and needs awareness of maximum level. Extensive need of making them knowledgeable is need of hour.

Keywords- Health professionals, Awareness, Doctor, Nurse, Paramedical, BMW waste, Hazards

1. INTRODUCTION

All items in use when lose their credibility or usefulness turns to waste. It is generic term which is outcome of materials, things and products. Waste are normally subject of concern, irrespective of its source or domain. Waste can be termed as major environmental and health especially when it comes in tune of essential items such as health or hygiene. Wastes can be seen as product from home, school and any public places which may include industries etc. Concern is not quantum of generation alone but more of how it is handled. Directly or indirectly every person is responsible for waste irrespective of its being pronounced environmentally conscious or less conscious. If thought in terms growth orientation then it may vary as per habitants particularly the mode, mood or concern to manage elongation of lifecycle by recycle, reuse, remove, replace or any other technique. Very often the civilized generation plays the game of passing bug between have ones to have not ones in name of technology transfer and help. Prevention is always seen as best approach to minimize the waste generation and thereafter less need for its handling.

Health is a sector which has remained in light irrespective of age, level of growth and the wastes which are coming out from such sector i.e. Hospitals and Nursing Homes. The wastes have been categorized in different ways. The wastes coming out of this sector are Hazardous and deadly in nature beyond any ones expectations. The persons involved in it vary from much educated to least educated persons with varying degree of chance of being effected by contaminations. A study for awareness about the different aspects across different strata is need of hour for making associated persons aware about their getting affected and getting prey to such situation.

Chhattisgarh being most recent developing state having very diverse population has been chosen as area. The districts having population of more than lakh has been identified and survey has been carried out.

The situation obtained from the survey shows the level alarming level of awareness in the most ill educated section which is most vernable. The group which should be much aware is also less aware. Extensive awareness and education camps for persons across the panorama is required

2. TYPES OF WASTE

Different types of wastes can be classified as:-

Municipal Waste

The wastes from households, schools, offices, market places, restaurants, other public places which are often seen as wasted food, discarded plastic bags, cans, plastic bottles, broken furniture, grass clippings, waste home appliances and torn not fit for use clothing. The composition and existence of Municipal wastes in percentage can be viewed as shown in figure 1.

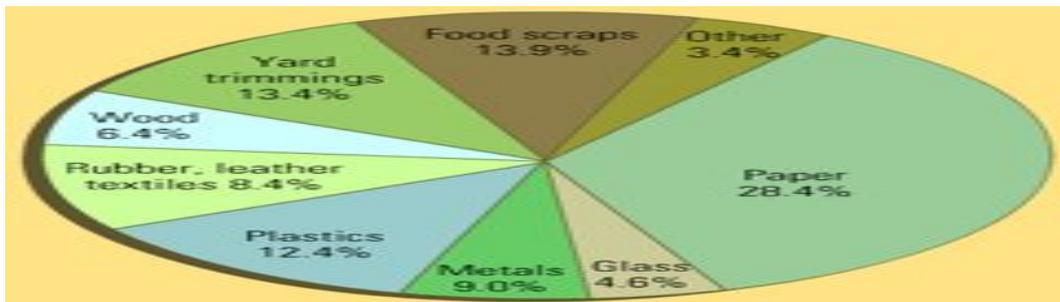


Figure 1

Agricultural Waste

Waste generated by agricultural activities which includes waste from horticulture, fruit growing, seed growing, livestock breeding, market gardens, seedling nurseries, etc. Empty thrown pesticide containers, old silage wrap, expired chemicals & medicines, wormers, used tires, surplus milk, cocoa pods, corn husks etc can be put in this basket.

Industrial Wastes

Growth of consumerisation, population and need for faster supply of produces, rapid Industrial growth or intensive revolution has led to typical types of wastes popularly known as industrial wastes.

Civil Constructions & Demolition Wastes

The intensive civil construction and dust and wastes coming out this are main constituents. Waste materials left out from the debris of civil infrastructure demolition also comes under this category.

Electronic Wastes

Waste arising out of electronic and electrical devices which are often called e-waste, e-scrap, or waste electrical and electronic equipment (WEEE). Major WEEE contains mainly hazardous lead, mercury, cadmium, and brominated flame retardants which are toxic and harmful to living beings and deadly to environment.

Biomedical Waste

Waste as outcome of health care facilities, such as hospitals, clinics, surgical theaters, veterinary hospitals and labs. The surgical items, pharmaceuticals, blood, body parts, wound dressing materials, needles and syringes comes under this category. The bio medical wastes as per their nature can be termed as hazardous waste rather than general waste

3. CATEGORIES OF BIO MEDICAL WASTES

“Bio-Medical Waste (Management & Handling) Rules, 1998” defines bio medical waste as any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biological, and including categories mentioned in Schedule I; [1] It has been categorized in 10 categories namely

- Cat 1 **Human Anatomical Waste** includes human tissues, organs, body parts.
- Cat 2 **Animal Waste** : animal tissues, organs, body parts carcasses, bleeding parts, fluid, blood and experimental animals used in research, waste generated by veterinary hospitals colleges, discharge from hospitals, animal.
- Cat 3 **Microbiology & Biotechnology Waste** :wastes from laboratory cultures, stocks or specimens of micro-organisms live or attenuated vaccines, human and animal cell culture used in research and infectious agents from research and industrial laboratories, wastes from production of biologicals, toxins, dishes and devices used for transfer of cultures.
- Cat 4 **Waste sharps** :needles, syringes, scalpels, blades, glass, etc. that may cause puncture and cuts. This includes both used and unused sharps.

- Cat 5 **Discarded Medicines and Cytotoxic drugs** :wastes comprising of outdated, contaminated and discarded medicines.
- Cat 6 **Solid Waste** :Items contaminated with blood, and body fluids including cotton dressings, soiled plaster casts, lines, beddings, other material contaminated with blood.
- Cat 7 **Solid Waste** “wastes generated from disposable items other than the waste shaprs such as tubings, catheters, intravenous sets etc..
- Cat 8 **Liquid Waste** : waste generated from laboratory and washing, cleaning, house-keeping and disinfecting activities.
- Cat 9 **Incineration Ash** : ash from incineration of any bio-medical waste.
- Cat 10 **Chemical Waste** (chemicals used in production of biologicals, chemicals used in disinfection, as insecticides, etc.. [1]

Out of these categories the cat 3, 4 and 5 are deadly ones and needs utmost care and awareness by the handlers. On an average 1.45 kg BMW is generated per patient per day in Indian hospitals compared to 4.5 kg in developed countries. As per western figures, approximately 15- 20% of this total BMW waste is hazardous. The percentage in case of India would be much higher because proper waste segregation and waste disposal methods either does not exist or not practiced. [2]

4. PRESENT STUDY OF AWARENESS & DISCUSSION

A questioners was developed to know the awareness level of Doctors, Para medical staffs and other staff members who are involved in the BMW. A cross sectional study was conducted in ten leading private hospital and nursing homes in major ten district headquarters of Chhattisgarh. About 1000 doctors, 1000 Nurse,1000 Lab Technicians, 1000 Ward Boys / Women and 1000 Sanitary Workers in equal proportions of 10 districts engaged in Hospitals and clinics were given the designed questioners and collected.

The study was conducted during March – July of 2016. Leading 10 Hospitals and Nursing Homes having bed capacity of minimum 100 were considered for survey. Questioner were distributed, interviews were conducted. The participation of various groups was voluntary. A pretested knowledge based questionnaire on biomedical wastes handling, was first provide in terms of handouts. Details were collected by data collection and interview method. The questionnaire was such framed that it had questions regarding general awareness, biomedical wastes(BMWs), knowledge regarding biomedical hazard, its representation by symbol, the storage time after collection, its disposal techniques, collection details regarding container for needle syringe, typical internationally accepted colour coding of bags used for storage and disposal, details about hazards due to exposure of BMWs. Statistical methods were applied to get graphical representations of correct responses was assessed and analyzed. The study group was after the collection of data provided with proper information about the correct handling of these BMWs. Techniques of proper handling for health education on safe biomedical waste handling was provided.

The data obtained from the samples were as follows:

Table 1 Knowledge about General Awareness of BMW

Knowledge parameter	Doctors	Nurses	Lab Tech	Ward boy / Women	Sanitary Workers
Known	789	664	662	435	244
Unknown	116	136	238	515	656
Unwilling	105	210	100	50	210

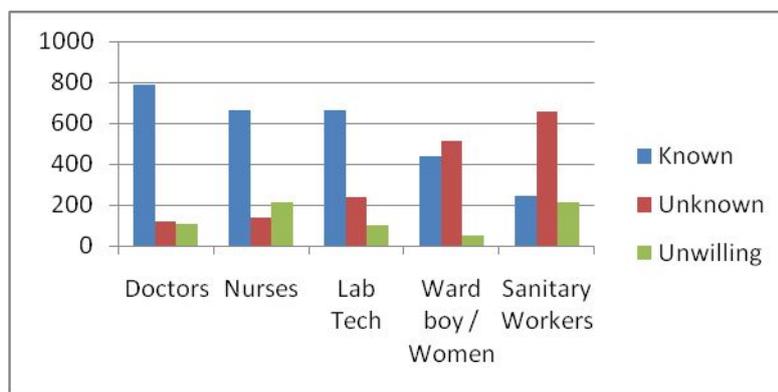


Figure 2 General Awareness about BMW

Analysis shows that the known group of Doctors is very high. Level of Sanitary workers is below average and needs more alertness.

Table 2 Knowledge about Bio Medical Symbols

Knowledge parameter	Doctors	Nurses	Lab Tech	Ward boy / Women	Sanitary Workers
Yes	892	683	688	272	338
No	12	117	112	325	283
Unwilling	106	200	197	403	373

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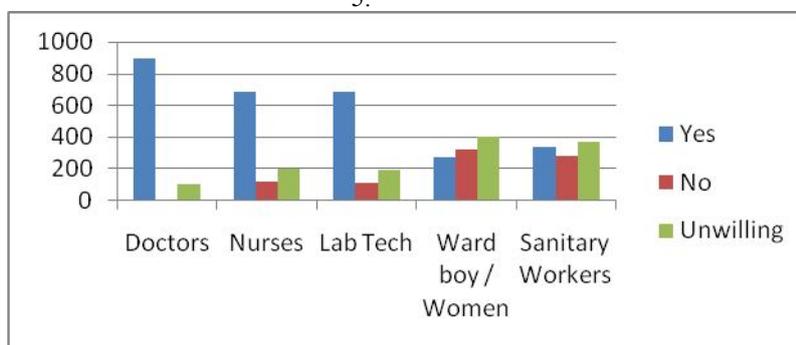


Figure 3 Knowledge about BMW Symbols

As usual the elite group of Doctors is high. The worst effected group of Sanitary workers is least knowledgeable in this case also.

Table 3 Knowledge about Disposal Techniques of sharp items among BMW

Knowledge parameter	Doctors	Nurses	Lab Tech	Ward boy / Women	Sanitary Workers
Yes	792	671	679	436	416
No	96	218	111	228	267
Do not care	112	68	210	336	317

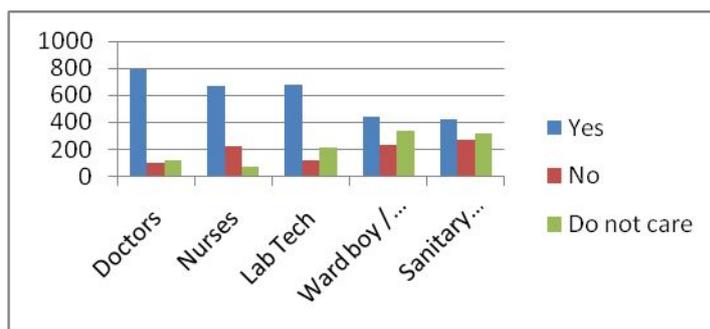


Figure 4 Knowledge about Disposal Techniques of sharp items among BMW

The disposable technique among sanitary group is high. The group of ward boys and nurses and Lab Technicians who are responsible for segregation and disposal are fairly knowledgeable.. Doctors are the masters in this case also.

Table 4 Knowledge about Disposal of Hazardous and contaminated items of BMW

Knowledge parameter	Doctors	Nurses	Lab Tech	Ward boy / Women	Sanitary Workers
Sensitive	787	676	560	434	421
Careless	110	118	229	356	353
Don't know	103	206	211	210	226

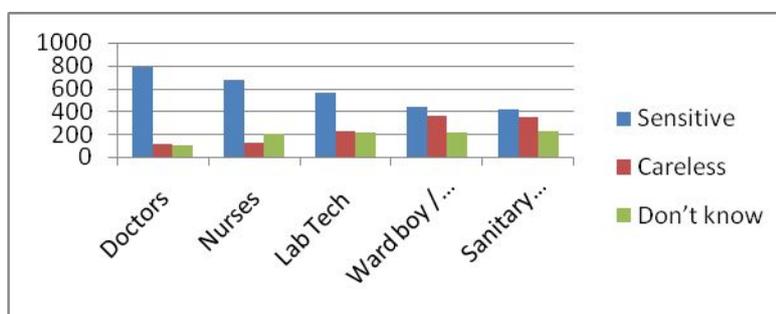


Figure 5 Knowledge about Disposal of Hazardous and contaminated items of BMW

The pattern is similar to the above discussion.

Table 5 Knowledge about Maximum Storage Time of collected BMW

Knowledge parameter	Doctors	Nurses	Lab Tech	Ward boy / Women	Sanitary Workers
More than 48 hrs	667	543	431	311	225
Less than 48 hrs	234	346	343	316	218
No idea	99	111	226	373	557

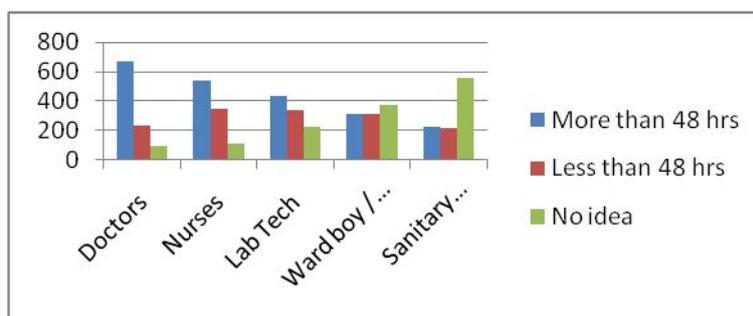


Figure 6 Knowledge about Maximum Storage Time of collected BMW

The analysis shows the very high ignorance in the Lab ward and Sanitary group. The condition of Lab Technician is also not good.

Table 6 Knowledge about Disposal Methods of collected BMW

Knowledge parameter	Doctors	Nurses	Lab Tech	Ward boy / Women	Sanitary Workers
Correctly known	438	522	418	128	122
No Idea	89	116	312	422	611
Follow others	406	362	170	280	187

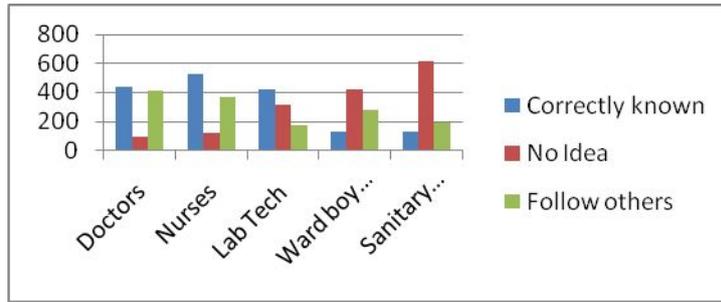


Figure 7 Knowledge about Disposal Methods of collected BMW

The situation is alarming in this case. The disposal methods scenario of knowledgeable to less ones is in increasing order only. The aspect requires a high training need.

Table 7 Knowledge about Types of Hazards that can affect exposers of BMW

Knowledge parameter	Doctors	Nurses	Lab Tech	Ward boy / Women	Sanitary Workers
Correctly known	612	446	431	216	116
No Idea	214	332	323	514	572
Follow others	114	222	246	241	226

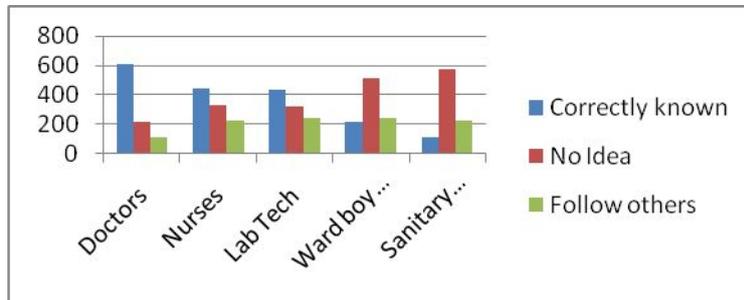


Figure 8 Knowledge about Types of Hazards that can affect exposers of BMW

In this case the Doctors are the only group who have adequate know how. The group of Nurses is less known whereas the group of Ward Boy and Sanitary workers is almost non knowledgeable. The Lab Technicians are also shaky group.

Table 8 Knowledge about Types of Colour Codes for bags of BMW

Knowledge parameter	Doctors	Nurses	Lab Tech	Ward boy / Women	Sanitary Workers
Correctly known	767	781	679	467	441
No Idea	123	113	111	223	336
Follow others	110	116	110	310	223

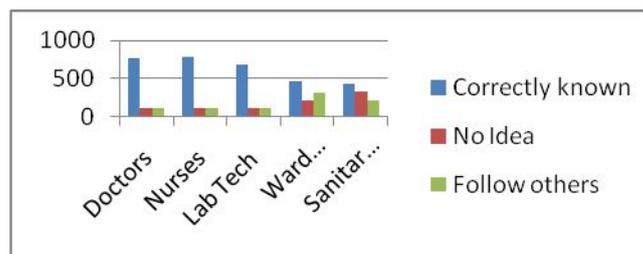


Figure 09 Knowledge about Types of Colour Codes for bags of BMW

The pattern shows the group responsible for handling is knowledgeable. The need for training requirement is high in the lesser qualified vernable group of sanitary workers.

Table 8 Knowledge about Acts , Rules & Provisions regarding BMW

Knowledge attainment	Doctors	Nurses	Lab Tech	Ward boy / Women	Sanitary Workers
Complete	454	323	328	211	123
Partial	346	456	461	526	616
No Idea	110	221	211	263	241

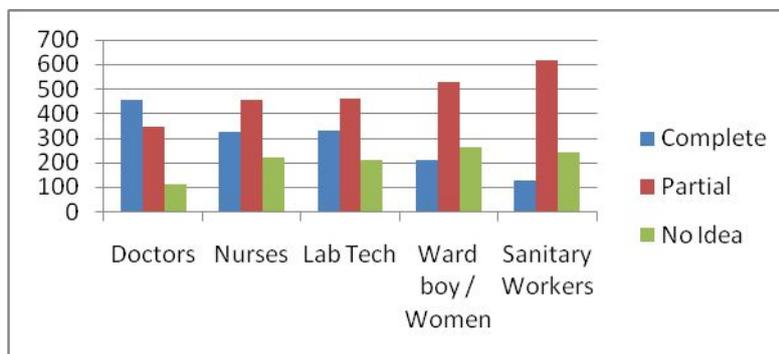


Figure 10 Knowledge about Acts , Rules & Provisions regarding BMW

The situation of ignorance about the Knowledgeable of Acts, Rules in the elite group is also low. There is need for inclusion in training and extensive inclusion in course curricula of the course. The distribution of leaflets and dos and don'ts among the concerned can help to increase the level of knowledge.

Table 9 Information about Diseases spread by BMW

Diseases	Doctors	Nurses	Lab Tech	Ward boy / Women	Sanitary Workers
HIV	789	676	565	345	311
Hep B	787	668	559	323	313
Hep C	789	669	561	332	214
TB	791	791	573	321	365
Tetanus	799	792	581	534	454
Syphilis	778	765	575	441	232
Leprosy	778	466	578	242	121
DM	781	643	683	221	121
RHD	769	568	545	323	112
Others	781	566	471	231	114

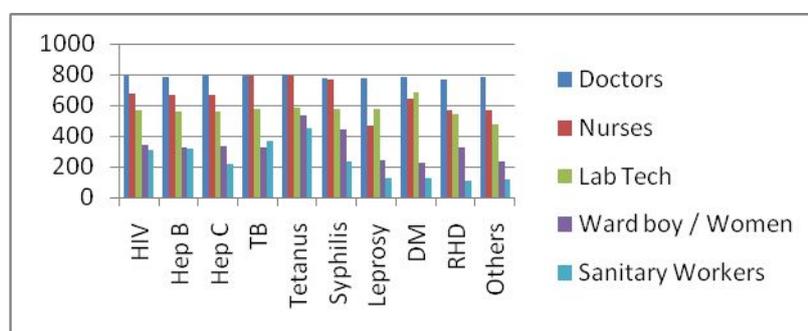
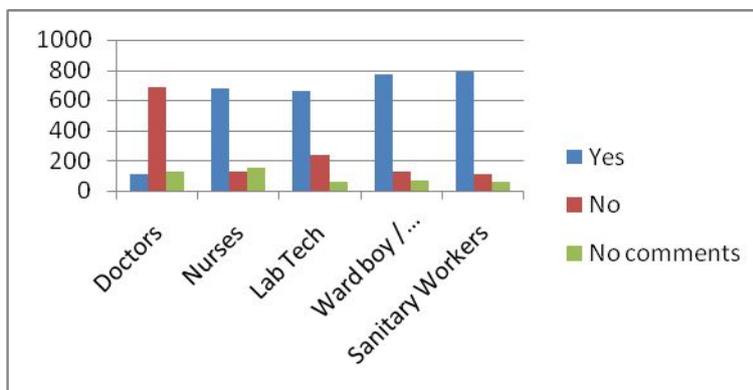


Figure 10 Information about Diseases spread by BMW

The result is as per knowledge and need only. The training need for lower group will make them enable to go for work in protective manner. The affect of handling will not see the group but will affect the persons who mostly come in contact. The group of Lab Ward boys and Sanitary persons need effective training in this aspect.

Table 10 Need of Training for awareness of BMW

Training Need	Doctors	Nurses	Lab Tech	Ward boy / Women	Sanitary Workers
Yes	112	676	665	775	791
No	688	124	235	125	108
No comments	127	156	57	68	59

**Figure 11 Need of Training for awareness of BMW**

The need for training is in line of the analysis of the previous sections. The level of need for training among Doctors perhaps is as refresher courses. In case of Nurses and Lab Technicians is need and to keep them aware. The sanitary workers group is a volatile group and its training will be difficult task. The select group is engaged as per need and strata are varied one

6. CONCLUSION

The study and discussion of the various group finding show that the group as per their level of education and training. The best group is of Doctors who are highly educated but are less prone to getting affected with this type of deadly waste. The group of Nurses and Lab Technicians who are handling the patients of having affection of contaminable disease are prone to get affected during the acts of vaccination and or actions when the wastes are getting generated. Here the multiple injection case for getting other patients affecting can also be the case. In case of Lab Ward boys / women and Sanitary workers they are the least educated persons and have very less affordability for bearing the medical expenses if they get affected are the most vulnerable persons. These groups have very less knowhow and are groups who for want of employment keep changing their place of working also.

The situation of awareness is poor to worse and need extensive training among classes of most vulnerable to least vulnerable ones. Extensive awareness and training camps are required.

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