# A Study to Assess the Knowledge on Biomedical Waste Management and Recommendations among the Health Care Personnel in Yashwant Hospital, Kodoli

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**Abstract:** _Background and Objectives: Despite the statutory provision of Biomedical Waste Management, practice in Indian Hospitals has not achieved the desired standard even after seven years of enforcement of the law. In view of this, the present study on Knowledge, of health care worker regarding biomedical waste management. on the subject was carried out in Yashwant hospital Kodoli. The hospital under is a 300 bedded super specialty teaching hospital and research centre with latest facilities. The study is based on a questionnaire designed to understand the Knowledge of the staff involved in direct patient care facility regarding the biomedical waste management practices. The study enrolled 50 respondents, representing doctors and nurses from selected patient care areas; The objectives of the study were 1) To understand the standard procedure for bio medical waste management. 2) To assess the current level of knowledge among the health care staff members 3) Identify the gap and to provide recommendation for efficient bio medical waste management. 4) To find the association between knowledge of health care worker with selected demographic variables. Methods: A descriptive approach with descriptive correlation design was used for 50 health care workers drawn through purposive sampling technique in a selected Yashwant hospital at Kodoli. The conceptual framework for the study was developed from the system model consists of 3 phases input, process and output hypotheses formulated were that there will be an association between knowledge & selected demographic variables. The content validity and reliability of the tools were established. The pilot study was conducted using a structured knowledge questionnaire.. An average of 4-5 observation was done. Results: The collected data was analyzed by using descriptive and inferential statistics. The study findings revealed Data presented in the figure shows that the respondents in pulse two have majority poor knowledge compare to post graduation. In all post graduation have good knowledge. Age is associated with the level of knowledge of health care worker ($\chi2 = 14.59$ $P>0.05$.) & Educational Experience is associated with the level of knowledge of health care worker ($\chi2 = 12.68$ $P>0.05$). The 'r' value computed was 0.82. Interpretation and Conclusion: Majority (54%) of health care worker had good knowledge & (26%) of health care worker have average knowledge & only (20 %) health care worker had a poor knowledge. Concluding from the results, the importance of training regarding biomedical waste management cannot be overemphasized; lack of proper and complete knowledge about biomedical waste management impacts practices of appropriate waste disposal. Suggestions: Proper and scheduled training has to be given for the staffs. Special training has to be given for the personnel who are handling the waste directly on regular basis._

**Keywords:** Hospital waste; biomedical waste management; color coding; Sharp disposal; health care worker; knowledge

## 1. introduction

An old saying says "*Cleanliness is next to Godliness*". The essence of this was aptly captured by Dravidians, who in 5000 BC gave due emphasis to immaculate town planning and safe and effective sewerage systems who got rid of all solid and liquid wastes generated by the pollution. They were indeed the pioneers as far as scientific waste management is concerned ; which is borne out from excavation of Mohanje-Dora and Harapa.

Biomedical waste management has recently emerged as an issue of major concern not only to hospitals, nursing home authorities but also to the environment. the bio-medical wastes generated from health care units depend upon a number of factors such as waste management methods, type of health care units, occupancy of healthcare units, specialization of healthcare units, ratio of reusable items in use, availability of infrastructure and resources etc.[1]

Need of biomedical waste management in hospitals the reasons due to which there is great need of management of hospitals waste such as:
1) Injuries from sharps leading to infection to all categories of hospital personnel and waste handler.
2) Nosocomial infections in patients from poor infection control practices and poor waste management.
3) Risk of infection outside hospital for waste handlers and scavengers and at time general public living in the vicinity of hospitals.
4) Risk associated with hazardous chemicals, drugs to persons handling wastes at all levels.
5) "Disposable" being repacked and sold by unscrupulous elements without even being washed.
6) Drugs which have been disposed of, being repacked and sold off to unsuspecting.[16]

## 2. Assumption

It is assumed that health care personal will have some knowledge regarding biomedical waste management in hospitals.

## Hypothesis

**H$_1$:-** Level of knowledge of biomedical waste generation, hazards and legislation among health care personnel will be average.

## Population, Sample and Sampling Techniques.

### Population:

Population includes all possible elements that could be included in research. [52] In this study the population was health care worker in Yashwant hospital.Kodoli.. The total population in the study includes 50 health care workers

### Sample:

Sample is a small portion of population selected for observation and analysis.[52]
The sample for the present study composed 50 health care worker.

### Sampling Technique

Sampling technique is the procedure, which the researcher adopts in selecting the samples for the study.[52]

To purposive sampling, subjects were selected from the sampling frame. According to the sampling criteria. Purpose sampling technique was adopted and 50 health care workers were selected.

### Development of the Blue Print

### Tool to Estimate the Knowledge of Health Care Worker Regarding Biomedical Waste Management

A closed –ended questionnaire was prepared based on the review of literature and in consultation with the experts in the field of Medicine, Nursing and related discipline.

The questionnaire has two parts. Part I and Part II.
**Part I:** It consists of three items regarding the demographic variables: age, gender and educational back ground.
**Part II:** It consists of question to estimate knowledge of nursing students regarding biomedical waste management. It has three sections. Section A, Section B, and Section C.

**Section A:** Consists of 15 multiple choice questions related to biomedical waste generation, health hazards and legislation. The maximum score is 15 in Section A

**Section B:**
Consists of 15 statements concerning biomedical waste management. Each statement has three answer options. The maximum score of Section B is 15.

**Sections C:**
Comprise 10 statements, again with three answer options. The maximum score of Section C is 10.
Thus altogether there were 40 items with maximum score of 40 for Part II of the questions.

### Validity

Validity is a measure of truth or accuracy of a claim and is an important concern throughout the research process. It refers to, whether a measurement instrument accurately measures what it is supposed to measure (Best, John W, James V Khan1999)[55]

The content validity of the tool and the structured questioners was established in consultation with five experts in the field of masters in preventive & social medicine and other related discipline. (Annexure-5) Experts were requested to give their opinion and suggestion regarding relevance, appropriateness and degree of agreement in each item of the tool. Suggestions and recommendations given by experts were accepted and necessary correction was done for modifying the tool.

### Reliability

Reliability means that the investigator consistently comes up with same measure when used on repeated occasions to establish reliability; the tool was administered to 12 health care workers other than the study sample. The spit half method was used to test the reliability of the tool. The tool was first divided into two equivalent halves and correlation for the half test was found using Karl Pearson's correlation coefficient formula. It shows that there is a significant correlation between the scores. The reliability coefficient of the whole test was then estimated by Spearman Brown Prophecy formula. The tool was found reliable(r=0.80).

Pilot study was conducted on 15 April 2013 among 10 randomly selected samples of the health care worker other than the study sample to find the feasibility of the study. The subjects for the pilot study possessed the same characteristics as that of the sample for the main study.

Prior to the study permission was obtained from the concerned authority. The selected subjects were informed of the purpose of the study and their consent was obtained. The researcher himself collected the data from the sample. A questionnaire test was conducted on15 March 2013.

### Data collection Process

The data collection process involves the precise, systematic gathering of information relevant to the research purpose, questions, or hypothesis of a study. [57]

The data collection period extended from 4/4/2013 to 5/5/2013. The health care worker was taken by purposive sampling. Questionnaire was administered which was collected on the same day. An average of 4-5 observation was done per day following which the knowledge questionnaire was administered to participant. The data collection process was terminated after thanking participants for their participation and co-operation.

### Plan data analysis

Analysis is the systematic organization and synthesis of research data and testing of the research hypothesis using the data.[58]

It was decided to analyze the data by both descriptive and inferential statistics on basis of objectives and hypothesis of the study. Master data sheet (Annexure X) was be prepared by investigator to analyze the data. The data will be analyzed in terms of descriptive (frequency and percentage) and inferential statistics Chi-square. Mean Standard deviation and mean percentage will be used to describe the knowledge of the health care worker regarding biomedical

waste management. The level of knowledge was then grouped into poor, average and good

## 3. Results

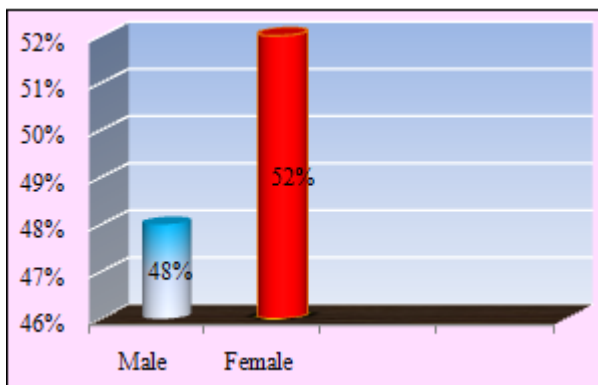### 1) Age distribution of HealthCare worker
Majority (32 %) of health care worker were within the age group of 20-30 years, 30 % health care worker of were within 31 -40 years. 22% health care worker of were within 41-50 years & only 16 % health care worker were in the age group of 51-60.
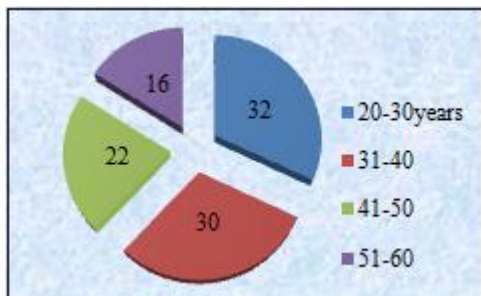


**Figure 4:** Pie diagram showing the age distribution of HealthCare worker

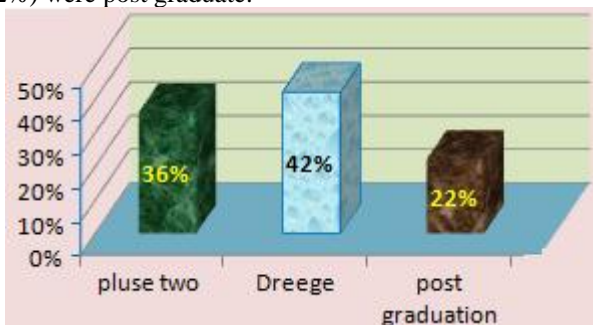### 2) Distribution of HealthCare worker according to their gender
Majority (52 %) of Health care workers were Female & (48 %) of Health care workers were Male



**Figure 5:** Cylindrical diagram showing the gender of HealthCare worker

### 3) Distributions of HealthCare worker according to educational qualification
Majority (42%) of HealthCare worker educational qualification were degree. & (36%) of pulse two & only (22%) were post graduate.
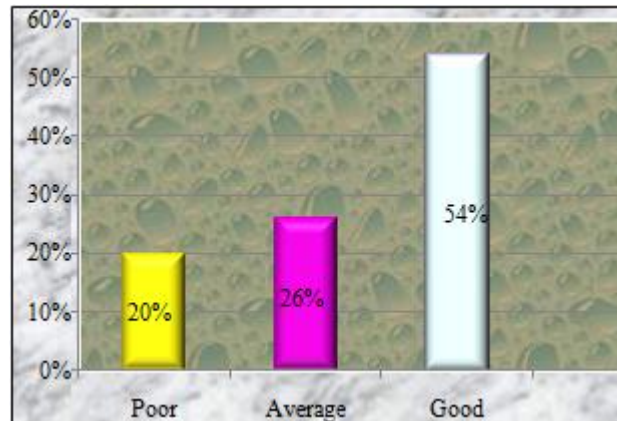


**Figure 6:** Bar diagram showing distribution of educational qualification of HealthCare worker

**Part II:** Analysis of knowledge of the health care worker on biomedical Waste Management

**Section A:** Assessment of level of knowledge
**Level of knowledge on biomedical waste management**
Majority (54%) of health care worker had good knowledge & (26%) of health care worker have average knowledge & only (20 %) health care worker had a poor knowledge.



**Figure 7:** Bar diagram indicating the level of knowledge health care worker regarding biomedical waste management.

Majority of 8 female respondents have poor knowledge of biomedical waste management. Whereas 7 Male has poor knowledge. Of biomedical waste management. Equal Number of Male & Female i.e. 8 both has good knowledge.

**Level of knowledge compared with age group:**
All four age groups have majority knowledge regarding biomedical waste management. Only four respondents from age 20-30 yrs & 41-50 have good knowledge. Whereas 3 respondents from 31-40, & 51-60 five respondents have good knowledge.

**Part II**

**Analysis of Knowledge of the Health Care Worker on Biomedical Waste Management**

**Section A: Assessment of Level of Knowledge**
In order to determine the level of knowledge of the health care worker the total Obtainable score of the questionnaire (40) was divided into 3 levels and 3 descriptive labels - poor, average and good. The data are presented in tables as follows:

**Table 7:** Distribution of level of knowledge of the health care worker, n=50

| Range of scores | Percentage of Scores | Level of knowledge | Number of Health care workers | Percentage % |
|---|---|---|---|---|
| 0-13 | 0- 33 % | Poor | 10 | 20% |
| 14-26 | 33 - 65 % | Average | 13 | 26% |
| 27-40 | 65-100 % | Good | 27 | 54% |
| Total | | | 50 | 100% |

The above table shows that majority (54%) of the health care worker had Good knowledge, where as 26 % of the health care worker had average knowledge and only (20%) health care worker had poor knowledge Analysis reveals that most of the health care worker had average knowledge regarding

biomedical waste management

## 4. Conclusion

Medical wastes pose significant impact on health and the environment. Especially in a developing country like India may be because of its huge population and pollution level when taken into account as such. However, from this study it can be said that though the management of waste is done in very appreciable level still there is an urgent need for raising awareness and education on medical waste issue for the staff. Proper waste management strategy is needed to ensure health and environmental safety.

The following conclusions were drawn on the basis of the findings of the study.

- Majority (52 %) of Health care workers were Female & (48 %) of Health care workers were Male
- Majority (32 %) of health care worker were within the age group of 20-30 years, 30 % health care worker of were within 31 -40 years. 22% health care worker of were within 41-50 years & only 16 % health care worker were in the age group of 51-60.
- Majority (42%) of HealthCare worker educational qualification were degree. & (36%) of pulse two & only (22%) were post graduate.
- Majority (54%) of health care worker had good knowledge & (26%) of health care worker have average knowledge & only (20 %) health care worker had a poor knowledge.
- Majority of 8 female respondents have poor knowledge of biomedical waste management. Whereas 7 Male has poor knowledge. Of biomedical waste management. Equal Number of Male & Female i.e. 8 both has good knowledge.
- All four age groups have majority knowledge regarding biomedical waste management. Only four respondents from age 20-30 yrs & 41-50 have good knowledge. Whereas 3 respondents from 31-40, & 51-60 five respondents have good knowledge.
- Plus two have majority poor knowledge compared to post graduation. In all post graduation have good knowledge.

Concluding from the results, the importance of training regarding biomedical waste management cannot be overemphasized; lack of proper and complete knowledge about biomedical waste management impacts practices of appropriate waste disposal.

**Following Recommendations Are Proposed**:

1) Strict implementation of biomedical waste management rules is the need of the hour,
2) It should be made compulsory for healthcare facilities to get their healthcare personnel trained from accredited training centers. These training sessions should not become merely a one-time activity but should be a continuous process depending upon the patient input in different healthcare facilities,
3) Training of sanitary staff should be specially emphasized, and
4) It should be ensured that the injuries happening to the healthcare personnel are reported to the person in-charge of biomedical waste management or to the biomedical

waste management committee, and they report it in the prescribed format to the pollution control board.

## 5. Suggestions

- Proper and scheduled training has to be given for the staffs
- Special training has to be given for the personnel who are handling the waste directly on regular basis.

## 6. Summary

This chapter dealt with the suggestion & recommendation of the study, the overall experience of conducting this study was a satisfying one as there was good co-operation from health care personal & authorities of Yashwant hospital. This study was a new learning experience for the researcher. The result of the present study shown that there is a great need for health care worker to update their knowledge on biomedical waste management

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