

# Studies on Knowledge, Awareness, Attitude and Practice of Biomedical Waste Management in Two Hospitals of Bidar District, Karnataka

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**Abstract:** *Medical care plays a vital role on human health, but the waste generated from medical activities represents a real threat for nature and human beings. Every day relatively large amount of potentially infectious and hazardous waste is generated in the health care hospitals around the world. Now it is well established fact that there are many adverse and harmful effects to the environment including human being which are caused by the hospital waste generated during the patient care. In present study undertook a survey of practice of bio-medical waste management such as collection, storage, transportation and disposal of biomedical waste. The present study attempted to find out the real state awareness, knowledge, attitude, generation and management of bio-medical waste in Gurunanak and Bhalke Vydehi hospitals of Bidar district, Karnataka, India. We found improper segregation of bio waste at the source of generation. It is highly desirable for a hospital to know the lacunas in the waste management for proper education to the employs.*

**Keywords:** Bidar, Health care, Waste management, Knowledge, Awareness, Attitude

## 1. Introduction

Hospitals are known for the treatment of the sick persons but we are unaware about the adverse effects of the garbage and the filth generated by them. Medical care is vital for our life and health, but the waste generated from medical activities represents a real problem of living nature and human world. "Bio- medical waste" is the waste generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining there to or in the production or testing of biological material (tudor et.al.2005, Srivastav 2000). According to bio -medical waste (management and handling Rules 1998) the government of India (Notification, 1998) species that hospital waste management activities, which are mainly engineering functions, such as collection, transportation, operation or treatment of processing systems and disposal of wastes. According to these rules, it is the duty of every "occupier" that is the person who has control over the institution or its premises, has to take all necessary steps to ensure that waste generated in hospitals and handled without any adverse effect to human health and environment. According to (Acharya and meeta 2000; Neema and Gareshrasad, 2000). The disposal of hospital waste can be very hazardous particularly when it gets mixed with municipal solid waste and is dumped in uncontrolled or illegal landfills such as vacant lots in neighboring residential areas and slums. This can lead to a higher degree of environmental pollution, apart from posing serious public health risks such as AIDS, Hapatitis, Plague, Cholera etc. According to (Sandhu Ts, Sing. N et.al 2003) Bio- medical waste management is a special case where in the hazards and risks exist not just for the generators and operators but also for the general community. Mc.Dougal et.al 2001 said that, main purpose of waste management are to clean up the surrounding environment and to identify the appropriate methods for waste neutralization recycling and disposal. Accordance with (Rutala .W. et. al 1989) and ( Sheth K.N.et.al 2006)) within waste management (WM) and health care waste

management (HCWM) is a process that helps to ensure proper hospital hygiene and safety of health care workers and communities. HCWM concerns about planning and procurement, staff training and behavior, proper use of tools, machines and pharmaceuticals proper methods applied for segregation, reduction in volume, treatment and disposal of bio-medical waste. The present study tries to find out the real state of affairs of the awareness, knowledge, attitude, generation and management of bio-medical waste in Gurunanak and Bhalke Vydehi hospitals of Bidar district Karnataka, India.

## 2. Material and Methods

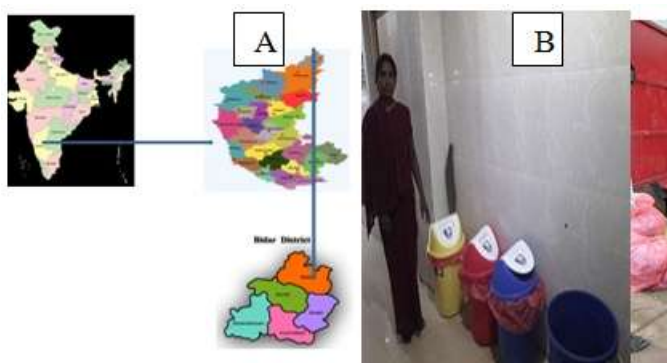
### The study area

Bidar is a hill top city situated on the Deccan plateau in the north eastern part of Karnataka state, India. Being located at the forth east of 700km (430ml) from the state capital Bangalore. Bidar is located at 17.9° N and 77.5°E, lies at a central position in Deccan plateau at an elevation of 2300 feet from near the sea level. Ethical clearance from institutes ethics committee and permission from Medical Superintendent to collect data from various patient care areas was taken before the study; the study was approved by Department of P.G. Studies and Research in Zoology, Gulbarga University, Gulbarga, Karnataka, India in 2016.Common regional facility for final disposal of infectious waste was also informal discussion with various hospital functionaries were carried out. Studied wastes generated in to hospitals were weighed during a two week for each hospital.

### Quantitative determination of waste

The following steps were involved in the determination of the bio- medical waste generated from different places in the study centre:

- A. solid waste of both types infectious and non-infectious was weighed with the assistance of the staff and the weight was recorded
- B. Each color coded bin or liner meant for collection of particular waste in each block was weighed and recorded.
- C. The quantities of infectious and non-infectious waste were recorded in each block of each liner for 20 days and all the data was compiled to represent the average values.
- D. The supporting staff of each block was briefed over denature of assistance and support that was needed in determining the quantity of wastes during the study period.
- E. The below figure shows the study area.



**Figure1:** A-Shows the study area, B: Liners in the ward Gurunanak, C: Quantified bio-waste Gurunanak, D: Transportation of bio-waste



E: Common bean used in Bhalke Vydehi, F: Improper dumping of waste in Bhalke Vydehi, G: Improper disposal of general waste in bhalke Vydehi

### 3. Results and Discussion

Our main object of qualitative analysis of biomedical waste in both the hospital was whether they are following these segregation rules at the source of waste generation or not. And the Table 5 shows the KAP (Knowledge-Awareness-Practice) of Gurunanak Hospital and Bhalke Vydehi Hospital staff. This shows that in Gurunanak hospital only Doctors, GDMO nurses are aware about Handling Rules remaining staff members are not aware. In

Bhalke Vydehi hospital doctors are aware about the Handling Rules. Table 5 shows that KAP of both the Hospitals. KAP of Vydehi Hospital was very poor and it was about only 25.28%. KAP of Gurunanak hospital is good, Peon and Ayahs don't have the knowledge about the segregation rules but all the staff members have positive attitude towards proper segregation of waste and practicing it properly.

**Table 1:** Facility available in Vydehi and Gurunanak hospital in Bidar, Karnataka, India

Sl. No	Name Of Wards	BhalkeVydehi hospital	Gurunanak Hospital
1	Causality	Yes	Yes
2	Trauma care	Yes	Yes
3	General male ward	Yes	No
4	General female ward	Yes	No
5	Sharing rooms	Yes	No
7	Single private room	Yes	No
8	Post recovery room	Yes	No
9	Male ortho ward	Yes	No
10	Pediatric OPD	Yes	No
11	Surgical OPD	Yes	Yes
12	Medical OPD	Yes	No
13	Male surgical ward	Yes	No
14	Oncology OPD	Yes	No
15	Gynecology OPD	Yes	Yes
16	NICU	Yes	No
17	MICU	Yes	No
18	ICCU and ICU	Yes	No
19	SICU	Yes	No
20	Female surgical ward	Yes	No
21	Minor OT	No	Yes
22	Burns ward	No	Yes

\*The data represented with yes or no.

#### A. Quantitative analysis of biomedical waste

Each color coded bin or liner meant for collection of particular waste in each block was weighed and recorded for 20 days to get average value. Table 2 and 3 shows the average quantity of waste in Kg/day of each liner in each block of Gurunanak Hospital and Bhalke Vydehi Hospital respectively.

There is a prescribed color coded liner is meant for the collection of particular waste. As per Bio-medical waste (Management and Handling) Rules, 1998. We observed that, in Bhalke Vydehi Hospital blocks/ward don't have the color coded liner and the waste generated is collected in one common bin in the wards. In Gurunanak Hospital only 2 wards have the color coded liner. The average waste present in yellow liner was 3.75 kg; blue was 4.5 kg, red was 8.0 kg and green was 4.95 kg per day.

**Table 2:** Quantification of bio-waste in Gurunanak Hospital (Date of quantification from 01-10-2016 to 20-10-2016)

SL. No	Name of Wards	Average Quantity of Waste in Kgs/day						Total Number of beds	Total Number of Patients
		Black	Yellow	White	Blue	Red	Green		
1	Causality	Empty	0.16	No bin	2	3	0.5	3	2
2	Minor OT	Empty	0.25	No bin	0.5	2	0.15	1	0
3	Injection Room	Empty	0.9	No bin	0.15	1	0.25	2	1
4	General Ward	No bin	0.12	No bin	0.25	0.5	0.5	8	6
5	Gynecology Ward	Empty	0.25	No bin	0.15	0.15	0.15	25	12
6	Burns Ward	Empty	0.95	No bin	0.55	0.75	0.25	8	10
7	Surgery OT	No bin	0.5	No bin	0.2	0.25	0.15	1	0
8	Orthopedic OPD	No bin	0.12	No bin	0.5	0.15	0.5	2	0
9	Pediatric OPD	Empty	0.5	No bin	0.2	0.2	2.5	5	5
<b>Total</b>			<b>3.75</b>		<b>4.5</b>	<b>8.0</b>	<b>4.95</b>	<b>55</b>	<b>36</b>

**Result of Bhalke Vydehi Hospital**

- When we visited the hospital the number of patients in the hospital was very less.
- In the hospital no ward contain the liners for segregation at the point of generation all wastes are dumped in one common dust bin present in the each ward.
- The transportation of waste is regular by “**Enviro Biotech**”.

- In the hospital the wastes such as food, empty bottles, papers and plastic covers are dumped in the open area in the left side of the hospital.
- Each ward and OPD (outpatient department) are clean but there is no proper segregation of wastes.

The wastes in the left side of the hospital affect the health of flora, fauna and that whole environment.

**Table 3:** Quantification of bio-waste in Bhalke Vydehi Hospital (Date of quantification from 05-11-2016)

Sl. No	Name of wards	Average weight of bio waste (kg/day)	Total number of beds	Average number of patients per day
1	Causality	2	4	5
2	Trauma care	1	4	4
3	General male ward	4	10	6
4	General female ward	2	5	4
5	Sharing rooms	3	2	6
7	Single private room	1	2	2
8	Post recovery room	0.5	5	3
9	Male ortho ward	1	3	2
10	Pediatric OPD	2	3	3
11	Surgical OPD	1	5	2
12	Medical OPD	2	5	1
13	Male surgical ward	1	3	-
14	Oncology OPD	1	2	-
15	Gynecology OPD	3	4	3
16	NICU	0.5	6	-
17	MICU	0.25	4	-
19	ICCU and ICU	0.5	4	2
20	SICU	0.5	2	1
<b>Total</b>		<b>26.25</b>	<b>73</b>	<b>44</b>

**Table 4:** Awareness regarding bio-medical waste (Management and handling) rules, 1998 in the hospitals

SL. No	Designation	Aware (A) Not Aware (NA)	
		Name of the Hospitals	
		Gurunanak Hospital, Bidar	Bhalke Vydehi Hospital, Bidar
1	Doctor (specialist)	A	A
2	Doctor (Resident)	A	A
3	GDMO	A	A
4	Nurse	A	A
5	Technician	A	A
6	Pharmacist	A	A
7	Ward boy	A	NA
8	Peon	NA	NA
9	Ayahs	A	NA
10	Sweeper	NA	NA

**Result of Gurunanak Hospital**

- In the hospital two wards don't contain liners; those wards have only one common dust bins. And remaining all wards and OPD (outpatient department) has liners and there is proper segregation of wastes, collection and transportation of the generated wastes in the hospital regularly.
- And all nurses, ayahs, workers doing it properly and regularly.
- In the hospital the response was communication was good.
- 75% of the waste is segregated and transported regularly.
- All workers in the hospital have the knowledge of segregation in the particular liners
- Only two wards have no liners and all the wastes are dumping in the one common bin.

There is one common white puncture proof plastic box to collect the used needles and syringes.

**Table 5:** Knowledge Attitude and Practice in the Hospital

SL. No.	Designation	Knowledge (Yes/No)		Attitude (Positive/Negative)		Practice (Yes/No)	
		GKH	BVH	GKH	BVH	GKH	BVH
1	Doctor (Specialist)	Y	Y	+	+	Y	Y
2	Doctor (Resident)	Y	Y	+	+	Y	Y
3	GDMO	Y	Y	+	+	Y	Y
4	Nurse	Y	N	+	+	Y	N
5	Technician	Y	N	-	-	Y	N
6	Pharmacist	Y	N	-	-	Y	N
7	Ward Boy	Y	N	-	-	Y	N
8	Peon	N	N	-	-	Y	N
9	Ayahs	N	N	-	-	N	N
10	Sweepers	N	N	-	-	N	N
11	Clerks and Other Staffs	N	N	-	-	N	N

GKH-Gurunanak Hospital, BVH-BhalkeVydehi Hospital

**4. Conclusion**

Concluding from the results, the nurses having the knowledge than the lab technicians regarding biomedical waste management, whereas sanitary staff had a very poor knowledge about it. Segregation of waste at source is the key step and reduction, reuse and recycling should be considered in proper perspective. Intensive training and orientation classes need for all the staff of hospitals to improve the knowledge, attitude and practice about disposal of bio-medical waste. Hence monitoring at regular time interval is needed for all staff, along with strict implementation of the guidelines for biomedical waste management. It is firmly believed collective community effort rather than individual attempts would make handling and disposal of bio-medical waste economically and operationally viable.

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