



KNOWLEDGE AND AWARENESS OF BIOMEDICAL WASTE MANAGEMENT AMONG FINAL YEAR STUDENTS OF A MEDICAL AND DENTAL COLLEGE IN MYSURU, INDIA.

Medical Science

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ABSTRACT

Introduction:- The waste produced in the course of health care activities carries a higher potential for infection and injury than any other type of waste. It is estimated that annually about 0.33 million tons of hospital waste is generated in India and, the waste generation rate ranges from 0.5 to 2.0 kg per bed per day. The major clinical man force in teaching hospitals after the Doctors or consultants are the Undergraduate and the Postgraduate students, who along with the consultants are responsible for generation of Biomedical Waste in the bargain of providing treatment to patients. Hence the knowledge and awareness of Biomedical Waste Management is of paramount importance amongst the students as they will be the future man force in the hospitals.

Methodology:- Data was collected using pre-designed and self-administered questionnaire. Questionnaires were distributed to all the students simultaneously during their regular theory classes.

Results:- 88% to 90% students knew the exact meaning of Biomedical Waste. 50% to 60% students knew about the storage and 40% to 50% knew about the disposal of Biomedical Waste. only 12% were aware about new BMW Rules'2016.

Recommendations:- This study reveals that there are some shortfalls in the knowledge of the students. Even though the topic of BMW is included in the curriculum, there should be an essential need for better education to further improve the knowledge of BMW by well designed seminars, programs, workshops and assessments.

KEYWORDS:

Biomedical Waste Management, Medical, Dental, Students, Knowledge, Awareness.

INTRODUCTION:

Biomedical waste (BMW) is waste generated during diagnosis, treatment or immunization of human beings or animals, or in research activities pertaining thereto, or in the production and testing of biologicals, and is contaminated with human fluids.¹ The waste produced in the course of health care activities carries a higher potential for infection and injury than any other type of waste.² Approximately 75-90% of the bio-medical waste is non-hazardous and as harmless as any other municipal waste. The remaining 10-25% is hazardous and can be injurious to humans or animals and deleterious to environment. It is important to realize that if both these types are mixed together then the whole waste becomes harmful.³

In 2011, it was estimated that gross generation of BMW in India was 4,05,702 kg/day of which only 2,91,983 kg/day was disposed, which means that almost 28% of the wastes was left untreated.⁴ Hospital-acquired infections have been estimated at 10% of all life-threatening diseases in the Southeast Asia region and have been identified as one of the indicators for the management of waste.⁵

All Bio-medical waste generated in the hospital should be disposed off strictly in accordance with Bio-Medical Waste Management Rules 2016. Schedule I of which describes the categories of Bio-medical waste and their segregation, colour coding and type of container, collection, treatment, processing and disposal methods. Schedule II of which describes the standards for treatment and disposal of Bio-medical waste.¹

A strong emphasis on cleanliness and systemic disposal of all wastes including hospital waste is aimed by the Government of India and has been launched as the "Swachh Bharat Abhiyan" with a goal to make India "cleaner and greener" and to create a better livable atmosphere.

The major clinical man force in teaching hospitals after the Doctors or consultants are the Undergraduate and the Postgraduate

students, who along with the consultants are responsible for generation of Biomedical Waste in the bargain of providing treatment to patients. Hence the knowledge and awareness of Biomedical Waste Management is of paramount importance amongst the students as they will be the future man force in the hospitals.

Keeping in view the above scenario, the present study has been undertaken to assess the current knowledge and awareness regarding different aspects of Bio-medical waste among the undergraduate students of a Medical College and Dental College in south India.

AIMS and OBJECTIVES:

To assess the knowledge and awareness of Biomedical Waste Management among the undergraduate students of a Medical College and Dental College.

METHODOLOGY:

A cross-sectional observational study was conducted in the year 2016 among the Undergraduate final year students (MBBS and BDS) of a Medical and Dental College. The subjects were fully informed about the design and purpose of the study. A verbal informed consent was obtained from each participant and anonymity of the participants was maintained throughout the study. The data was collected on a pretested structured questionnaire distributed among these students in the classroom, and they were asked to fill the questionnaire. The questionnaire was distributed to a total of 209 students of which 116 were final year MBBS students and 93 were final year BDS students. The questionnaire consisted of questions to assess the knowledge and awareness towards Bio Medical Waste Management. The data was analysed using Microsoft Excel 2007 version statistical software. The responses of the students were graded as Satisfactory (>80% correct responses), Intermediate satisfactory (50% – 80% correct responses) and Unsatisfactory (<50% responses). Period of the study was from July 2016 to October 2016.

RESULTS:-

Of the 209 students to whom the questionnaire was distributed, 174 students responded (93 MBBS final year students and 81 BDS final year students). Of the 93 MBBS students, 60% were females and 40% were males. Similarly among the 81 BDS students, 72% were females and 28% were males. The mean age for MBBS and BDS students was 22.26 ± 0.8 years and 21.32 ± .94 years respectively, shown in Table 1.

Table 1. Data presentation of participants

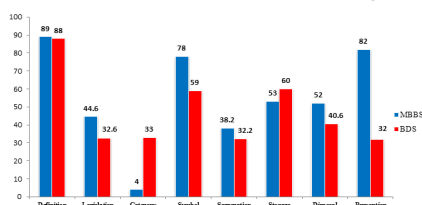
Statistics	MBBS		BDS	
	Number (n)	Percentage (%)	Number (n)	Percentage (%)
Male	37	40	23	28
Female	56	60	58	72
Total	93	100	81	100
Mean and Standard Deviation of age				
MBBS				22.26 ± 0.8.06
BDS				21.32 ± 0.94

Table 2. shows the result in percent and p-value of the MBBS and BDS

Aspects	Q. No.	MBBS				BDS				Chi Square test	p value
		Correct response (n)	Correct response %	Incorrect response (n)	Incorrect response %	Correct response (n)	Correct response %	Incorrect response (n)	Incorrect response %		
Definition	1	78	84	15	16	75	93	6	7	2.336	0.1264
	2	90	97	3	3	73	90	8	10	2.208	0.1373
	3	80	86	13	14	66	81	15	19	0.367	0.5444
Legislation	4	50	54	43	46	23	28	58	72	10.423	0.0012
	5	24	26	69	74	10	12	71	88	4.17	0.0411
	6	50	54	43	46	47	58	34	42	0.169	0.6807
Category	7	4	4	89	96	27	33	54	67	22.979	0.0001
Symbol	8	73	78	20	22	48	59	33	41	6.682	0.0097
Segregation	9	53	57	40	43	15	19	66	81	25.321	0.0001
	10	16	17	77	83	44	54	37	46	24.782	0.0001
	11	35	38	58	62	17	21	64	79	4.959	0.026
	12	39	42	54	58	25	31	56	69	1.831	0.176
	13	34	37	59	63	29	36	52	64	0.011	0.9175
Disposal	14	77	83	16	17	64	79	17	21	0.195	0.6591
Storage	15	49	53	44	47	49	60	32	40	0.778	0.3776
Disposal	16	21	23	72	77	17	21	64	79	0.005	0.9444
	17	76	82	17	18	42	52	39	48	16.354	0.0001
	18	15	16	78	84	3	4	78	96	5.929	0.0149
	19	52	56	41	44	38	47	43	53	1.067	0.3016
Prevention	20	76	82	17	18	26	32	55	68	41.925	0.0001

BMWM aspects	MBBS	BDS
Definition	89	88
Legislation	44.6	32.6
Category	4	33
Symbol	78	59
Segregation	38.2	32.2
Storage	53	60
Disposal	52	40.6
Prevention	82	32

Figure 1. Correct responses cumulative percentage %



students having knowledge and awareness about Bio Medical Waste Management. Overall knowledge of the MBBS and BDS students pertaining to the definition of Biomedical Waste was satisfactory. Knowledge pertaining to legislations on BMW management was Intermediate-satisfactory but comparatively better among MBBS students (54%) than BDS students (28%) and the difference was statistically very significant (0.0012). Knowledge on the categories of BMW was very poor among both the classes (MBBS – 4%, BDS – 33%) of students but comparatively better among the BDS students and the difference was statistically very significant (p = 0.0001). Both MBBS and BDS students had unsatisfactory/ poor knowledge on segregation of waste with correct response of 38.2% and 32.2% respectively. Knowledge and awareness on the storage of BMWM was intermediate satisfactory among both groups (MBBS – 53%, BDS – 60%), but on disposal of BMW, it was Intermediate satisfactory in case of MBBS students (52%) and Unsatisfactory among BDS students (40.6%) and the difference was statistically significant (p = 0.0001). MBBS students were well aware of the preventive aspect of BMWM (82%) as compared to BDS students (32%) and the difference was statistically significant (p = 0.0001). Table 3 and Figure 1 represent the cumulative percentage of the correct responses given by both the groups.

DISCUSSION AND CONCLUSION:-

Since not many studies have been conducted to assess the Knowledge and Awareness on BMW management exclusively among the undergraduate students, it is not possible to compare. In present study, 88% to 90% students knew the exact meaning of Biomedical Waste similar to findings of Saini et al.,(86%).⁶ 33% to 40% of the students were aware of generation and Segregation of BMW contrast to Saini et al.,(92%).⁶ 50% to 60% students knew about the storage and 40% to 50% knew about the disposal of BMW. Only 30% to 40% of the students knew about BMWWM legislations, where only 12% were aware about new BMWWM Rules'2016. Effective knowledge is essential among people who generate the hospital waste and not only those who handle it as these are the future man force of the healthcare and will be directly responsible for the generation Bio Medical Waste. This study reveals that there are some shortfalls in the knowledge of the students. Even though the topic of BMWM is included in the curriculum, there should be an essential need for better education to further improve the knowledge of BMWM by well designed seminars, programs, workshops and assessments. The study was conducted among 174 undergraduate students only; therefore one could argue

that the findings are not necessarily a generalization of all the undergraduate students' knowledge and awareness about the same.

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