ISSN: 2581-5989
PubMed - National Library of Medicine - ID: 101738774

International Journal of Dental Science and Innovative Research (IJDSIR)

IJDSIR : Dental Publication Service

Available Online at: www.ijdsir.com

Volume – 4, Issue – 1, January - 2021, Page No. : 262 - 266

Knowledge, Awareness and practice about Biomedical waste management among undergraduate BDS students in Bihar

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Citation of this Article: Desh Deepak, Abhishek Gupta, Kumari Sonam Jha, Rohit, Anshu Singh, Swagat Kumar Mahanta, "Knowledge, Awareness and practice about Biomedical waste management among undergraduate BDS students in Bihar", IJDSIR- January - 2021, Vol. – 4, Issue - 1, P. No. 262 – 266.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Introduction: Biomedical waste is an unavoidable product which is produced in large quantities by medical and dental healthcare workers during the routine procedure. They are to be managed wisely as they could be hazardous to everyone coming in contact with it. Different rules and regulations have been advised and implemented by regulatory bodies of India. Dental students being the future practioners should be aware of these rules and regulations and also should them.

Material and Methods: This crossectional prospective study was conducted among the 500 undergraduate BDS students and interns of Dr. B.R Ambedkar institute of Dental Sciences, Patna, Bihar in December 2020. They were asked to fill a survey form consisting of three sections with 1 answers to be selected for each questions. Section 1 had 3 demographic questions. Section 2 had 15 questions on knowledge and awareness , Section 3 had 5 questions on practice of biomedical waste managements.

Results: 423 (94.84%) students were not aware of the biomedical waste management laws in India. 245 (54.39%) students were aware that there are different categories of biomedical wastes generated in our hospital. Only 44 i.e 9.86% of the students knew and 337 (75.56 %)

didn't knew regulatory body for medical waste transport. Only 36 (8.07%) students said Final disposal of dental care waste is via certified collector. Only 102 (22.8%) could identify the correct sequence of the six effective steps of biomedical waste management. Only 160 (35.87%) students were aware that biomedical waste shouldn't be stored beyond 24 hrs. 267 (59.86%) and 305 (68.38%) students could identify the infected as category for extracted tooth and impression materials and cotton respectively. 316 (70.85%) students knew that excess amalgam is stored in fixer solution. 198 (44.39%) studetns knew that puncture proof plastic is used to carry infected sharps. 245 (54.9%) students thought that all the health care waste are hazardous. 346 (77.57%) students didn't knew about clinical waste management. 310 (69.50%) students knew about color coding for waste separation. In section 3 (Table 2) there were 5 question regarding practice of biomedical waste management. 431 (96.63%) students didn't knew if our institution have a tie up with waste management companies. 410 (91.92%) students didn't dispose all kinds of waste into general garbage. 228 (51.12%) students didn't segregated biomedical waste according to different categories and they didn't follow color coding as well. 301 (67.48%) students said they would report needles and sharp injuries.

Conclusion: The knowledge, awareness and practice was positive/maximum among the interns followed by the consecutive year of BDS from 4th to 1st year.

Keywords: Medical Waste, Students, Dental, Waste Management, Waste Products.

Introduction

Biomedical waste (BMW) is defined as any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals, or in research activities pertaining thereto, or in the production or testing of biologicals.[1] There has been a trmendious increase in biomedical waste in the recent decade and it is continuously increasing as the patients approach to medical health facilities is increasing in general and awareness and availability of Oral health care in recent few years in Bihar. The biomedical waste in dentistry includes general waste products such as needles, gloves, syringes as well as chemical waste products such as mercury, silver amalgam, fixer and developer.[2,3] Dental waste products are also increasing because there is need of lot of x ray films which taken for diagnosis, treatment and follow up as well.[2,3] These all biomedical waste produced in dentistry are harmful to the patients, health care professionals and general public if they come in direct contact with them or can be disastrous to nature as well. So proper regularized channel is required to collect, transport and dispose the waste material properly.

This demands a formal education among the dental healthcare workers regarding the recognition and management of the dental waste products. This study was conducted to assess the knowledge, awareness and practice regarding the biomedical waste among the dental students of Patna.

Materials And Methods

This cross-sectional study questionnaire based survey was conducted in Dr. B.R Ambedkar Dental Institute, Patna in year December 2020. Among the 500 undergraduate students of BDS from 1st year to final year and Interns, 463 students who gave their consent to participate in the study were included in the study and were given the questionnaire form. The convenience sampling method was used as the 463 students who desired only participated in the study. The single response and closed ended questionnaire was adapted and modified on the basis of study by Parida A etal[4] and Puri S etal.[5] The questionnaire consisted of three sections. Section 1 had 3 questions of demographic date i.e, age, gender and

designation. Section 2 had 15 questions regarding their awareness and knowledge of biomedical waste. Section 3 had 5 questions regarding practice of biomedical waste. The questions were validated by the pool of subject experts. There was no marks for right or wrong answers. All the response were tabulated and statically analyzed.

Results

Among the 500 dental students and interns , 463 i.e 92.60 % of the students participated in the study. The questionnaire form were incompletely filled by 446 students so they were discarded and remaining 436 forms were included for evaluation. The 446 forms were completely filled by 341 (76.45%) females and 105 (23.54%) males. The average age of the students was 20.25 with minimum age of 18 years and maximum age of 25 years. The participants students were, **89** (19.95%) from BDS 1st year, **94** (21.07%) from 2nd year BDS , **92** (20.62%) from 3rd year, **96** (21.52 %) from 4th year BDS and **75** (16.81%) from Interns.

In section 2 (Table 1) there were 15 questions regarding the knowledge and awareness of biomedical waste. 337 (75.56%) of the students were aware of the term healthcare waste. 423 (94.84%) students were not aware of the biomedical waste management laws in India. 245 (54.39%) students were aware that there are different categories of biomedical wastes generated in our hospital. Only 44 i.e 9.86% of the students knew and 337 (75.56 %) didn't knew regulatory body for medical waste transport. Only 36 (8.07%) students said Final disposal of dental care waste is via Certified collector. Only 102 (22.8%) could identify the correct sequence of the six effective steps of biomedical waste management. Only 160 (35.87%) students were aware that biomedical waste shouldn't be stored beyond 24 hrs. 267 (59.86%) and 305 (68.38%) students could identify the infected as category for extracted tooth and impression materials and cotton respectively. 316 (70.85%) students knew that excess amalgam is stored in fixer solution. 198 (44.39%) studetns knew that puncture proof plastic is used to carry infected sharps. 245 (54.9%) students thought that all the health care waste are hazardous. 346 (77.57%) students didn't knew about clinical waste management. 310 (69.50%) students knew about color coding for waste separation.

In section 3 (Table 2) there were 5 question regarding practice of biomedical waste management. 431 (96.63%) students didn't knew if our institution have a tie up with waste management companies. 410 (91.92%) students didn't dispose all kinds of waste into general garbage. 228 (51.12%) students didn't segregated biomedical waste according to different categories and they didn't follow color coding as well. 301 (67.48%) students said they would report needles and sharp injuries.

Discussion

Biomedical waste is tremendously increasing day by day and posing a threat to the environment, healthcare workers and the general population as well. Any breach in protocol and improper managements can become hazardous. Individuals dealing with/ producing the biomedical waste should be well aware and educated about the potential threat of biomedical waste. Dental students being among them should be well educated and should thoroughly follow all the guidelines. Our study was conducted to get a baseline data on the level of knowledge, awareness and practice of the dental students in Bihar.

Our study revealed that 75.56 % of students were aware of the term healthcare waste , Whereas only 58.7 % students were aware of the term in study by Mazhar S eatal[6]. Our 5.15 % students said they were aware of biomedical waste management laws in India, whereas 90.7 % (doctors) were aware of it in study done by Mathur V etal[7] . 54.93 % of our students mostly the interns (100%) and the 4th BDS (93.75%) were aware that there are different

categories of biomedical wastes generated in our hospital which was similarly (91.9%) reported by Puri S etal.[5] only 9.86 % of our students Pollution control board of India as the regulatory body for medical waste transport whereas a quite high percentage i.e around 50% and 58.4 % of students in study done by Khubchandani K etal[8] and Puri S etal[5] respectively. Only 8.07 % of our students were aware that the final disposal of dental care waste is via certified collector whereas 84.4 % students knew in study done by Puri S etal.[5] our 22.86 % students were aware of the correct sequence of the six steps of biomedical waste management, whereas 57 % students were aware in study by Puri S etal.[5] our 35.87 % students were knowing that the waste should no tbe stored for more than 24hrs whereas 48 % and 22% students were aware in study done by Mazhar S eatal[6] and Khubchandani K etal.[8] our 59.86 % students were aware that extracted tooth fall into infected category whereas 87.43% and 83.9 % students were aware of it in study done by Indhulekha V etal[9] and Puri S etal.[5] Our 68.38 % students were aware of the infected category for impression materials and cotton, wheras 60 % was noted in study by Puri S etal.[5] Our 70.85 % students were aware of storing excess mercury into the fixer solution whereas 55.9 % , 27.63% , 79.8% students were aware in study by Puri S etal[5], Khubchandani K etal[8], Singh T etal[10] respectively. Our 44.39 % students were knowing that sharps are disposed in puncture proof while 65.3% (doctors), 61.8 %, 52% were aware about it in study by Mathur V etal[7] , Puri S etal[5], Khubchandani K etal[8] respectively. 87.44 % of our students felt that biomedical waste management should be a practical exercise in dental colleges whereas 89.8%, 91.95 % students felt same in study by Khubchandani K etal[8] Puri S etal[5] respectively. Our 54.93 % students thought that all the health care wastes are hazardous whereas 93.3% and 52 % students considered that in study done by Singh T etal[10] and Mazhar S eatal[6] respectively. Only 22.42 % students in our study said that they know about clinical waste management process whereas 42.7% students said yes in study done by Mazhar S eatal.[6] 69.5 % of our students knew about color coding for waste separation whereas 46% students were knowing in study done by Mazhar S eatal.[6]

In the practice of the biomedical waste management, only 3.36 % of our students said that our institution have a tie up with waste management companies whereas 24.8% students said yes in study done by Khubchandani K etal.[8] 91.92 % of our students said that they do not through all the waste into general garbage whereas 68.7% students said so in study done by Khubchandani K etal.[8] our 39.01 % students segregate biomedical waste according to different categories and color coding whereas 90.6 % students segregated but only 69.45 % in study by Khubchandani K etal.[8] and 46 %,75 % and 92% (doctors) in study by Mazhar S eatal.[6], Singh T etal[10] and Mathur V etal[7] respectively. 67.48 % of our study said that they would report needles and sharp injuries whereas 58% students said same in study done by Mazhar S eatal.[6]

We observed that the knowledge, awareness and practice was positive/maximum among the interns followed by the consecutive year of BDS from 4th to 1st year. This shows that the level of knowledge and awareness have increased as the education level have increased and significantly when the clinical posting have been started. Also third year BDS students are taught abought biomedical waste in subject of community dentistry. We would recommend to introduce the education about biomedical waste management in the first year of BDS curriculum so that students would have the timely knowledge of the waste product they generate during their lab procedure.

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