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Attitude of intern doctors and B.Sc. nursing students regarding various aspects of biomedical waste (management and handling) rules: a cross sectional study

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ABSTRACT

Background: Different types of waste are generated during healthcare activities. The waste so generated has chance of causing serious infection and also injury to persons who come in contact with it whether the contact is direct or indirect. Safe and sustainable health care waste management is not possible without a favourable attitude among health care providers. The objective of the study was to assess the attitude of Intern doctors and B.Sc. nursing students: the future health care providers, regarding various aspects of Biomedical Waste (Management and handling) Rules.

Methods: This was a cross-sectional study. The study was conducted amongst Intern doctors and B.Sc. nursing students posted at Prince Bijay Singh Memorial (PBM) and associated group of hospitals attached to Sardar Patel Medical College, Bikaner.

Results: In the study out of 204 respondents, 54.4% were B.Sc. nursing students and 45.6% were intern doctors. Statistically significant difference was seen in overall attitude of study population belonging to different professional group regarding biomedical waste management. Overall the attitude of study group was favourable.

Conclusions: Favourable attitude of health care workers will go a long way in better implementation of biomedical waste management rules and thereby help in decreasing adverse health effects of improper waste handling.

Keywords: Biomedical waste management, Attitude, Intern doctors, B.Sc. nursing students

INTRODUCTION

"Bio-medical waste" means 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, including other categories mentioned in Schedule I.¹

With the increase in population there has been a rapid increase in the number of hospitals both in the public sector and the private sector. This increase in the health care institutes has resulted in the increase in the health care waste generated also.

The concern regarding the medical waste is mainly due to the presence of pathogenic organisms and organic substances in hospital solid wastes in significantly high concentrations.²

In India health care centers are not paying adequate attention towards treatment and disposal of waste. As consequence health care personnel especially nurses and housekeeping personnel are at risk of injuries; annual injury rates are 10-20 per 1000 workers.³ Potential risk to health care workers comes from the handling of infected sharps: 60% of health care workers sustain an injury from sharps knowingly or unknowingly during various procedures. The practice of re-capping the needle after use is the major factor for needle stick injuries.⁴

The proper disposal of these waste require a dynamic waste management plan that conforms to federal, state, and local regulations and provide adequate personnel and financial resources to ensure implementation.⁵

The issue of improper Hospital Waste Management in India was first highlighted in a petition filed by Dr. B. L. Wadhera in 1996 against the Union of India in the Honorable Supreme Court. Pursuant to the directives of the Honorable Supreme Court, the Ministry Of Environment and Forests, Government of India issued certain draft rules called biomedical waste management and handling rules, 1998. These rules have been amended time and over. Recently this has been modified and now new draft rules which may be called the "Bio-Medical Waste (Management and Handling) Rules, 2015" have been published for discussion and are appreciable as they will eliminate the overlapping in categories which earlier had made segregation and disposal difficult to understand and comply with for health care staff. 1

The objective of these rules are mainly to reduce waste generation, to ensure its efficient collection, handling, as well as safe disposal in such a way that it controls infection and improves safety for employees working in the system. For this to happen, a conscious, coordinated, and cooperative effort has to be made from physicians to hospital staff.⁷

Doctors and nurses play a key role in the BMW management. They need to segregate the waste and store it in the correct bins at the point of generation. In order for them to fulfill this function efficiently, it is important that they not only have the knowledge about the importance of segregation and how to distinguish the different containers and bins for the various types of biomedical Waste but also have attitude to implement the same.

Keeping this in view, the present study was carried out to assess the attitude about various important aspects of biomedical waste (management and handling) rule, 1998, among the intern doctors and B. Sc. nursing students- the future doctors and health care workers, of a tertiary care hospital of Bikaner, Rajasthan, so that this current status of respondent's attitude towards biomedical Waste Management will not only help to improve implementation and ensuring compliance of Act provisions but also help to frame future strategy accordingly.

METHODS

A cross sectional study was done to assess the attitude of the intern doctors and B.Sc nursing students posted in various departments of Sardar Patel medical college and associated group of hospitals, Bikaner– Rajasthan (India) regarding biomedical waste (management and handling) rules. The study was carried out from October 2012 to Janauray 2013.

Endeavour was made to include all intern doctors and B.Sc nursing students posted at Sardar Patel medical college and associate group of hospitals during the period of study. A total of 204 subjects could be interviewed who were physically present during the course of study.

In order to obtain a free and true response each person was contacted at his/her place of posting personally and consent was taken from them after thoroughly explaining the objective of the research, components of questionnaire and usefulness of the study to the subjects and assuring them of confidentiality.

Data was collected after taking written permission from the principal and controller of S. P. medical college and associate group of hospitals and other authorities concerned.

The data was collected using a predesigned and pretested schedule and the questions were asked individually in Hindi or local Language of Bikaner.

The schedule consisted of 25 close ended multiple choice questions from all the various important aspects of biomedical waste (management and handling) rule, 1998, framed in three separate sections.

Section 1: Administrative aspects and safe management =12 items

Section 2: Classification, segregation and colour-coding =8 items

Section 3: Storage, transportation, treatment and disposal =5 items

The data was entered in MS excel. Scoring of attitude was done as explained below. Appropriate statistical test were applied as per need of the study.

Scoring of attitude

The schedule had 25 questions divided into 3 sections. First, scoring of attitude was done, for each right answer a score of +1 was given and for every wrong answer a score of "0" was given. Then the level of attitude on the basis of their total score was classified into 3 levels, favourable (>70%), moderately favourable (41-70%) and unfavourable (0-40%) as given below.

Table 1: Section wise scoring for level of attitude regarding biomedical waste (management and handling) rule, 1998.

Maximum score	Range of score	Level of awareness			
Section: 1 administrative aspects and safe management					
12	10-12	Favourable			
	6-9	Moderately favourable			
	0-5 Unfavourable				
Section: 2 classification, segregation and colour-coding					
	7-8	Favourable			
8	4-6	Moderately favourable			
	0-3	Unfavourable			
Section: 3 storage, transportation, treatment and disposal methods					
	5	Favourable			
5	3-4	Moderately favourable			
	0-2	Unfavourable			
Overall attitude					
	20-25	Favourable			
25	11-19	Moderately favourable			
	0-10	Unfavourable			

RESULTS

In the study out of 204 respondents, 54.4% were B.Sc. nursing students and 45.6% were Intern doctors (Table 2).

On assessing the attitude regarding administrative aspects and safe management of biomedical waste, majority of study population (92.2%) had moderately favourable to favourable attitude (59.3% moderately favourable and 32.9% favourable attitude) whereas less than 8% study population had unfavourable attitude (Table 3).

Most (59.3%) of the study population had moderately favourable attitude regarding classification, segregation and colour-coding of biomedical waste (Table 3).

Among study population, more than 2/3rd (71.6%) had moderately favourable attitude about storage, transportation, treatment and disposal methods of biomedical waste (Table 3).

On assessing overall attitude of study population regarding various important aspects of biomedical waste management 93.1% had moderately favourable to favourable attitude (67.1% and 26.0% respectively) whereas only 6.9% had unfavourable attitude (Table 3).

Although the association between attitude of Study Population with their professional group regarding administrative aspects and safe management of biomedical waste and also the classification, segregation and colour-coding was found to be statistically significant, the association between various professional groups of study population and their attitude regarding storage, transportation, treatment and disposal methods of biomedical waste was found statistically insignificant (Table 4).

Statistically significant difference was seen in overall attitude of study population belonging to different professional group regarding biomedical waste management (Table 4).

Table 2: Distribution of study population according to professional groups.

Professional groups	Number (%)
B.Sc. nursing	111 (54.4)
Intern doctors	93 (45.6)
Total	204 (100.0)

Table 3: Attitude of study population about various important aspects of biomedical waste (management and handling) rule, 1998.

Attitude of study population administrative aspects and safe management				
Attitude	Number (%)			
Favourable	67 (32.9)			
Moderately favourable	121 (59.3)			
Unfavourable	16 (7.8)			
Total	204 (100.0)			

Attitude of study population about classification, segregation and colour-coding				
Favourable	47 (23.0)			
Moderately favourable	121 (59.3)			
Unfavourable	36 (17.7)			
Total	204 (100.0)			
Attitude of study population about storage, transportation, treatment and disposal methods				
Favourable	31 (15.2)			
Moderately favourable	146 (71.6)			
Unfavourable	27 (13.2)			
Total	204 (100.0)			
Overall attitude of study population				
Favourable	53 (26.0)			
Moderately favourable	137 (67.1)			
Unfavourable	14 (6.9)			
Total	204 (100.0)			

Table 4: Association between the attitude of study population and their professional groups regarding various important aspects of biomedical waste (management and handling) rule, 1998.

Administrative aspects and safe management						
	Attitude					
Professional groups	Favourable	Moderately favourable	Unfavourable	Total number		
	N (%)	N (%)	N (%)	1 otai number		
B. Sc nursing students	27 (24.3)	76(68.5)	8(7.2)	111		
Intern doctors	40 (43.0)	45(48.4)	8(8.6)	93		
Total	67 (32.9)	121(59.3)	16(7.8)	204		
χ^2 =8.94595, df=2; p<0.05						
Classification, segregation and colour-coding						
B. Sc nursing students	18 (16.2)	65(58.6)	28(25.2)	111		
Intern doctors	29 (31.2)	56(60.2)	8(8.6)	93		
Total	47 (23.0)	121(59.3)	36(17.7)	204		
χ^2 =12.86694, df =2, p<0.01						
Storage, transportation, treatment and disposal methods						
B. Sc nursing students	13 (11.7)	85(76.6)	13(11.7)	111		
Intern doctors	18 (19.4)	61(65.6)	14(15.0)	93		
Total	31 (15.2)	146(71.6)	27(13.2)	204		
χ^2 =3.225571, df =2, p>0.1						
Overall attitude of study population						
B.Sc nursing students	18 (16.2)	83(74.8)	10(9.0)	111		
Intern doctors	35 (37.6)	54(58.1)	4(4.3)	93		
Total	53 (26.0)	137(67.1)	14(6.9)	204		
χ^2 =12.67338, df=2; p<0.01						

DISCUSSION

A total of 204 respondents participated in the study. Out of them 111 (54.4%) were B.Sc. nursing students and 93 (45.6%) were Intern doctors.

On assessing the attitude nearly more than 90% of study population had moderately favourable or favourable attitude towards administrative aspects and safe management of biomedical waste.

The association between attitude of study population regarding administrative aspects and safe management of biomedical waste with the professional group was found to be statistically significant. Similar observation were shown by Mensudar, Karthick, Amutha, Vivekanandhan in study about survey on biomedical waste management in Chennai, where around 96% health care workers agreed the biomedical waste management is a serious issue and the waste has to be properly handled and disposed. They also accepted (90%) that it is just not the government responsibility, but the duty of every person who is involved in the process of creating biomedical waste. Around 97% of them accepted that it is not an extra burden on the regular duty work. All of them accepted that the success of the waste management is a team work and not a single person's issue. The same conclusion was drawn in other studies.

In present study, majority (82.3%) of study population had moderately favourable to favourable (59.3% moderately favourable, 23% favourable) attitude regarding classification, segregation and colour-coding of biomedical waste. More interns (91.4%) had moderately favourable to favourable attitude as compared to B.Sc. nursing students (74.8%) regarding classification, segregation and colour-coding of biomedical waste. The association between professional group and attitude regarding classification, segregation and colour-coding of biomedical waste was found to be significant. Better results were observed by Suwarna, Ramesh, in their study on health care wastes management among hospital staff at Bangalore with all the study subjects agreeing that hospital waste should be segregated properly and 87.5% agreed it should be segregated at the point of waste generation.¹² The attitude of the study subjects toward separation of infectious and non-infectious waste was positive. The nurses (91.5%) had a better attitude toward separation of wastes. Shafee, Kasturwar, Nirupama also documented in their study that 99.2% subjects attitude toward separation of infectious and non-infectious waste was positive. 10 99.5% nurses had better attitude toward separation of waste. So was the case in study by Rudraswamy, Sampath, Doggalli where 69.5% strongly agreed that the use of color codes for segregation of waste is a must.14

In present study more than 2/3rd (71.6%) had moderately favourable attitude regarding storage, transportation, treatment and disposal methods of biomedical waste. The difference in attitude of various professional group regarding storage, transportation, treatment and disposal methods of biomedical waste was statistically insignificant. Others observed better findings than our study. ^{10,12} In these studies nurses (91.5%) had a better attitude toward separation of wastes, proper disposal, implementation of rules and cooperation in programs.

Overall attitude of study subjects was favourable towards various aspects of biomedical waste management. Almost all intern doctors had favourable attitude with only 4.3% having unfavourable attitude as compared to nursing students of which 9% had overall unfavourable attitude. In study by Sachan, Patel, Nischal also almost whole of the staff (doctors and nurses) showed a positive attitude towards the need for measures for safe collection and final disposal of BMW and supported the ongoing efforts. ¹⁵ 100% doctors and 60% nurses have a positive attitude towards biomedical waste management. More than 90% nursing staff had positive attitude in study by Singh, Srivastava. ¹⁶ In our study the difference was found to be statistically significant.

CONCLUSION

Thus we can conclude that overall the attitude of study population was favourable regarding biomedical waste management and handling. This favourable attitude is needed in all the health care workers as a positive attitude amongst health care workers will go a long way in better implementation of biomedical waste management rules and thereby help in decreasing adverse health effects of improper waste handling.

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Institutional Ethics Committee

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