



EFFECTIVENESS OF A TRAINING PROGRAM ON KNOWLEDGE AND ATTITUDE ABOUT BIOMEDICAL WASTE MANAGEMENT AMONG UNDERGRADUATE DENTAL STUDENTS.

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Conflicts of Interest: Nil

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Abstract:

Background: The proper management of biomedical waste has become a worldwide humanitarian topic today. Hazards of poor management of biomedical waste have aroused the concern world over, especially in the light of its far-reaching effects on human, health and the environment. The awareness of health care professionals towards biomedical waste and its management can prevent possible hazards. With this milieu, this interventional study was carried out on third and final year students aimed at assessing the effectiveness of a training programme on knowledge and attitude about biomedical waste management.

Methods: 100 students (60 third years and 40 final years) were assessed for their knowledge and attitude regarding biomedical waste management. A self-structured questionnaire containing 30 questions was given to all the students. An educational training program was conducted and a short lecture on biomedical waste management was delivered to the students by an investigator in this study. After the session the questionnaire was re-administered to them. The data was analysed using software Statistical Package for Social Sciences (SPSS) version 20. The statistical analysis of the data was done using appropriate statistical tools.

Results: Final year students showed significantly better knowledge ($p = 0.002$) and attitude ($p = 0.004$). In third years, the results showed statistically significant difference only in knowledge scores ($p = 0.003$). Though the attitude scores have increased it is not statistically significant.

Conclusion: Final year students had significantly better knowledge and attitude towards biomedical waste than third years after session. Awareness lectures were helpful in improving the knowledge and attitude of students.

Keywords: Biomedical, Waste, Dental, Management

INTRODUCTION:

Biomedical waste (BMW) is defined as any waste generated during diagnosis, treatment operation or immunization or in research activities including production of biologicals (1). Dental colleges/hospitals produce a large amount of hazardous biomedical waste in the form of cotton, gauze, syringes, chemicals, latex, masks, sharps and other materials, often infected with patient's body fluids (2). This waste, if not treated properly, not only produce a significant health hazard to the persons coming in contact with it, but also has the potential to pollute environment. Many pathogens have been documented to be transmitted during Biomedical Waste Management (BMW) handling and segregation and disposal of which, Human Immunodeficiency

Virus (HIV), hepatitis B Virus (HBV), hepatitis C Virus (HCV) are often implicated (3). Also sharps, if not handled and managed properly, may cause prick injuries, may be reused leading to serious diseases. Implementation of an efficient waste management system in the hospitals can prevent the possible health hazards (4). The ministry of environment and forests has promulgated the Biomedical Waste Management and Handling Rules in 1998 for improving the overall waste management of health care facilities in India. The rules are applicable to all involved in generation, collection, receiving, storage, transportation and handling of BMW in any form (5). The Government of Tamil Nadu has enacted the Tamil Nadu Private Clinical Establishment (Regulation) Act, 2018 to regulate and control biomedical waste generated by private hospitals,

nursing homes and other clinical establishments in the State of Tamil Nadu. Although, the awareness of hazards and proper BMW management is increasing globally, studies have shown unsatisfactory level of awareness among health care professionals in India(6,7,8).In India, studies have estimated the average hospital waste generation rate ranges between 0.5 and 2.0 kg/bed/day and annually about 0.33 million tons of waste are generated(9).In dental practice, though most of the hazardous bio-medical waste is generated by clinical practitioners, clinical work by dental undergraduate (UG) and postgraduate (PG) students also contribute for the biomedical waste. Moreover, practices that students begin their career with usually become habits that are difficult to change thereafter. This indicates the importance of addressing BMW management issues among undergraduates Thus, with this background, this study was conducted to assess the effectiveness of a training programme on knowledge and attitude about biomedical waste management among the undergraduate dental students of our institution.

METHODOLOGY

This interventional study was conducted among the sampled population of 100 undergraduate dental students. This study included all the students belonging to third and final year enrolled in the Bachelor of Dental Surgery (BDS) programme. An informed consent was obtained from each participant for the study after detailed explanation of the study procedure. A pre-tested questionnaire was taken from a similar study conducted in India (10).The questions were pretested for reliability and validity. Sampling was done based on convenience method to include maximum number of students. Data collection was done with the help of a structured close-ended questionnaire. Inclusion criteria of the study are those who are consenting for the study and third and final year dental students. Exclusion criteria of the study are those who are not available at the time of study. The study was conducted in two stages. Stage 1 (Assessment): After explaining the purpose of the study and taking consent, a pretested questionnaire consisting of 30 close-ended questions was given to them to be filled out. Stage 2

(Intervention): An educational training program was conducted and a short lecture on Biomedical Waste Management was delivered to the students by an investigator in this study. This lecture includes power point presentations on various topics of BMW management, demonstrations of BMW equipment, procedures, and usage of color-coded bags. Charts on BMW management were displayed. After the session the questionnaire was re-administered to them. The data was analysed using software Statistical Package for Social Sciences (SPSS) version 20. The knowledge responses were allotted scores (correct responses = 1, incorrect/blank response = 0).Scores of knowledge and attitude were computed. The scoring criteria based on correct response to questionnaire is shown in Figure 1.Wilcoxon sign rank test and Mann-Whitney U test were done to compute the difference between knowledge and attitude of students. P value less than 0.05 was considered as statistically significant. Approval of the institutional ethics committee was taken prior to the commencement of the study.

RESULTS

A total of 100 students (60 third year and 40 final year) completed the questionnaire. Table 1 shows distribution of knowledge and attitude scores for 3rd and final year student's pre and post session. Third year and final year students after the session showed excellent knowledge scores of 68.3 and 90.3% and good attitude scores of 75%and 90.3% respectively. None of the students had poor scores after session.

Table 2 shows comparison of mean knowledge scores and attitude scores between third and final year students and the results showed a statistically significant difference between pre and post score of both the groups. Table 3 shows Comparison of mean knowledge and attitude score for 3rd year students and final year students within the group and the results showed a statistically significant difference in both knowledge scores and attitude scores of final years before and after session. In third years the results showed statistically significant difference only in knowledge scores though the attitude scores had increased, it is not statistically significant.

Table 1: Distribution of knowledge and attitude scores among third and final year students pre and post session

	3 rd year				Final year			
	Pre		Post		Pre		Post	
KNOWLEDGE	N	%	N	%	N	%	N	%
Excellent	-	-	41	68.3	-	-	37	90.3
Good/ average	40	66.8	19	31.7	11	26.8	4	9.7
POOR	20	33.2	-	-	30	73.1	--	-
ATTITUDE								
Excellent	10	16.6	45	75	-	-	37	90.3
Good/ Average	40	66.8	14	23.3	19	46.3	4	9.7
Poor	10	16.6	-	-	22	53.6	-	-

Table 2: Comparison of mean knowledge scores and attitude scores between third and final year students.

	3 rd year	Final year	P value
Pre knowledge score	7.17±1.73	10.20 ± 2.12	0.004 [#]
Post knowledge score	13.12 ± 2.1	17.75 ± 3.86	0.000 [#]
Pre attitude score	6.46 ± 1.5	7.33 ± 1.8	0.014 [#]
Post attitude score	8.10 ± 1.13	8.14 ±1.15	0.000 [#]

Table 3: Comparison of mean knowledge and attitude score for 3rd year students and final year students within the group.

	KNOWLEDGE SCORE	P value	ATTITUDE SCORE	P value
Before class(3 rd year)	7.17±1.73	0.003*	6.46 ± 1.5	0.143
After class (3 rd year)	13.12 ± 2.1		8.10 ± 1.13	
Before class(final year)	10.20 ± 2.12	0.002*	7.33 ± 1.8	0.004*
After class (final year)	17.75 ± 3.86		8.14 ±1.15	

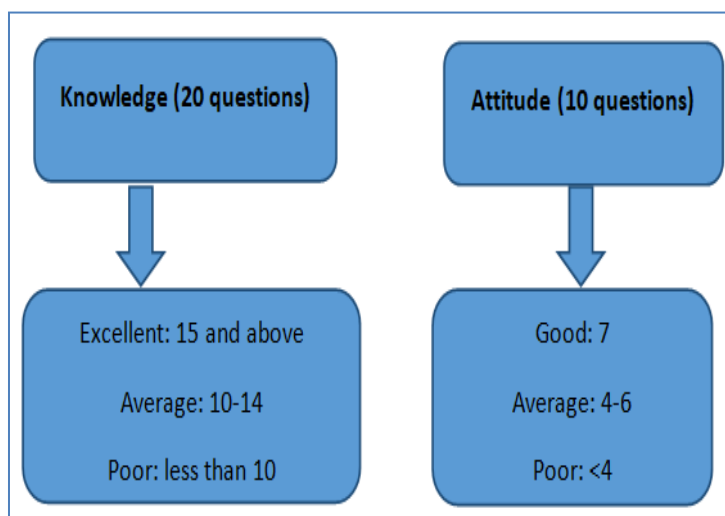


Figure 1: Scoring criteria based on response to questionnaire

DISCUSSION

After reviewing the literature, not many studies are published regarding knowledge of awareness regarding BMW among dental students who are one of the stakeholders for BMW which highlights the importance of this study and need of hour for early sensitization for BMW among budding dental students. For environment conservation and health of community, it is important to self-manage the health care waste (11). The waste produced in the course of healthcare activities carries a higher potential for infection and injury than any other type of waste. Its improper disposal can have direct and indirect health impacts as well as pose a potential threat to the surrounding environment, persons handling it, and the public in general. The present study assessed the effectiveness of a training programme on knowledge and attitude about biomedical waste management among the undergraduate dental students of our institution. In the present study, third year and final year students showed excellent knowledge scores of 68.3 and 90.3% respectively and showed good attitude scores of 75 % and 90.3% respectively after session. The study showed that the baseline knowledge and attitude of students on biomedical waste management, which was not adequate, improved significantly after the interventional strategy i.e, the lecture delivered by one of the investigators of the study. However when third and final year students were compared, the results showed statistically significant difference both in knowledge and attitude scores of 4th years before and after session and in third years the results showed statistically significant difference only in knowledge scores. The results of a previous study done by Saini R, Pithon MM et al (2013) showed good awareness and perception level of BMW management among students of an dental institute (12). Some studies suggests lack of adequate knowledge, awareness, practices, legislation and management among students/staff towards BMW management (Bala S, Narwal A et al 2013; Rudraswamy S, Sampath M et al 2012; Sharma A, Sharma V et al 2013)(13,14,15). One study suggests good attitude of staff towards BMW management while other suggested good knowledge but poor attitude and practice (Kishore J, Goel P et al 2000)(16). Training programmes may be designed for

students, dental staff and auxiliaries for proper management of BMW. The KAP (Knowledge, attitude and practice) of all persons who are involved in BMW management should be assessed periodically and training programmes should be modified as per requirements to fill the gap in their KAP towards BMW management. The limitation of this study is that it was conducted on 60 third year and 40 final year students, so it may not be generalization of knowledge and attitude of all dental students. Further studies with more sample size involving all concerned healthcare personals may provide a better assessment tool to evaluate the level of these training programmes as well as the ways of improvement. As present dental students are tomorrow's doctors, early sensitisation and repeated revision of this important topic for dental students will be useful in improving the awareness of biomedical waste disposal management in future doctors and will prove beneficial for the society at large.

CONCLUSION

Final years had significantly better knowledge and attitude towards biomedical waste. A well designed periodic awareness education by means of lectures, seminars and workshops of all the students, doctors and staff may play an important role in efficient management of BMW management. Early sensitisation of dental students will be useful in improving the awareness of biomedical waste disposal management. Further repetition will be useful for the knowledge levels to sustain. As Doctors have to play a role as a leader in a health care team, awareness of this important subject will be beneficial to the society at large.

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