A Study To Assess The Effectiveness Of Structured Teaching Programme On Knowledge Regarding Bio-Medical Waste Management Among B.Sc. Nursing Students In Selected Nursing Colleges At Jodhpur, Rajasthan, India.

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Abstract

Introduction-Waste management is an essential part of health care. Poor management of healthcare waste exposes healthcare workers, waste handlers, and the community to infections, toxic effects and injuries, and risks that pollute the environment. Of the total amount of waste generated by healthcare activities, 15% is considered hazardous material that may be infectious, chemical or radioactive. In 2010, unsafe injections were responsible for as many as 33,800 new HIV infections, 1.7 million hepatitis B infections, and hepatitis C infections.

Methodology-An evaluative approach was used and a pre-experimental one-group pretest posttest design was adopted for the study. The sample size was 50 B.Sc. Nursing students in selected nursing colleges at Jodhpur. A simple random sampling technique was used for the collection of data. The data collection was done by using a structured questionnaire. Collected data was analyzed by using descriptive and inferential statistics.

Results-In the present study during the pre-test, the maximum mean percentage obtained by the B.Sc. nursing students is found in the aspect of Introduction, Definition, Classification, and Source Of Bio-Medical Waste (53.33%), followed by Treatment of Bio-Medical Waste (37.50%), Purpose And Principle Of Bio-Medical Waste (35%) Category of Bio-Medical Waste (29.70%) and least mean percentage obtained in the aspect of Management of Bio-Medical Waste (29.46%). The overall Mean± SD of the pretest knowledge score was10± 4.342 and the mean percentage of 33.33%. In the present study during the post-test, the maximum mean percentage obtained by the B.Sc. nursing students is found in the aspect of Category of Bio-Medical Waste (89.90%), followed by Introduction, Definition, Classification and Source of Bio-Medical Waste (83.33%), Purpose And Principle Of Bio-Medical Waste (83%) Treatment of Bio-Medical Waste (82.5%) and least mean percentage obtained in the aspect of Management of Bio-Medical Waste (79.81%). The overall Mean± SD of the pretest knowledge score was 25.55± 5.042 and a mean percentage of 85.16%.

Conclusion

The conclusion was drawn on the basis of the findings of the study shows that there was an improvement in the knowledge of B.Sc. nursing students in selected nursing colleges at Jodhpur as evidenced by significant difference between the pre-test and post-test knowledge scores. The total difference in the mean of the overall knowledge score was 15.55 with the „t‟ value of 11.601

Keyword: B.Sc. nursing students biomedical waste management, Nursing College.

INTRODUCTION

Waste management is an essential part of health care. Poor management of health care waste exposes health care workers, waste handlers and the community to infections, toxic effects and injuries, and risks that pollute the environment.

Of the total amount of waste generated by health care activities, 15% is considered hazardous material that may be infectious, chemical or radioactive. In 2010, unsafe injections were responsible for as many as 33 800 new HIV infections, 1.7 million hepatitis B infections and 315 000 hepatitis C infections.

Now it is a well-established fact that there are many adverse and harmful effects to the environment including human beings which are caused by the "Hospital waste" generated during the patient care. Hospital waste is a potential health hazard to the health care workers, public and flora and fauna of the area. The problems of the waste disposal in the hospitals and other health-care institutions have become issues of increasing concern. The Government of India (notification, 1998) specifies that Hospital Waste Management is a part of hospital hygiene and maintenance activities. This involves management of range of activities, which are mainly engineering functions, such as collection, transportation, operation or treatment of processing systems, and disposal of wastes.

In a study of pattern of waste in Indian cities, the quantity of refuse varied from 0.48 to 0.06kg/per capita per day with total compost able matter varying from 30 to 40 percent. On an average, the volume of total solid waste in hospitals in India is estimated to range between 1kg and 3kg per day on a per bed basis. In a teaching hospital of 100 beds, solid waste averaged 1.5kg per day. It is estimated that about 0.5kg out of this consists of food waste. In a study carried out in the family wing of a large hospital, the composition of waste was bandages, gauge and cotton wool waste

34.1 per cent, coal ash 31.6 per cent, foliage 13.5 percent, food waste 11.5 percent and glass, bottle, etc 1.8 percent. A 1988 study at ALLMS revealed that 67.5 percent waste originated from wards, 13.4 percent from OPD and 19.1 percent from the service area.

To protect the environment and community health, the Ministry of Environment and Forest has notified, and Biomedical Waste (Management and Handling) Rules 1998/2000. Under the Environment Protection Act, 1986 that compel all hospitals, clinics, nursing homes, slaughterhouses and laboratories to ensure safe and environment sound management of waste produced by them. They should make all arrangement as specified in the Rules for the proper disposal of biomedical waste. The head of the health care facility, for e.g. Medical Superintendent of the hospital, Director, Owner of nursing home health care facility have to safeguard the health workers involved in handling transportation and disposal of Biomedical waste besides ensuring safety to the community and environment. Any violation of the norms given in Rules by any person is punishable.

In India, an article published by the Deccan Herald daily drew attention towards the dismal picture of hospital waste management in most hospitals and dispensaries in Bangalore. The author pointed out "owing to this,

hospitals and dispensaries may end up spreading the very disease they are trying to cure". The major causes as cited by the hospital authorities are lack of funds, erratic power supply, non-availability of space for land fill and the installation of incinerations.

OBJECTIVES OF THE STUDY

1. To assess the knowledge among B.Sc. nursing students regarding biomedical waste management.
2. To determine the effectiveness of structured teaching programme regarding the biomedical waste management among B.Sc. nursing students.
3. To find out the association between the knowledge regarding biomedical waste management and selected demographic variables among B.Sc. Nursing students.

METHODOLOGY

Research design and setting

The present study was a pre-experimental one group pre-test and post-test research design was conducted at the Mayurakshi college of nursing, jodhpur, in between month of September 2015.

Sample and sample technique

The present study sample was B.Sc. student of selected nursing colleges in jodhpur. The total sample size 50 were selected by using of simple random sampling technique.

Description of the tools

Part A: - Demographic profile consists of 07 items which includes age, gender, religion, place of residence, types of family, years of study, source regarding knowledge of information.

Part B: - Structured Knowledge questionnaire consists of 30 items. Items were prepared to assess knowledge and practice on bio medical waste management. Score interpretation was above 75% showing adequate knowledge, 50-75% showing moderate knowledge score and, below 50% showing inadequate knowledge score regarding the Bio-medical waste management.

Plan for Data analysis

The data obtained were planned to be analyzed in terms of objectives of the study using descriptive and inferential statistics. The plan of data analysis was as follows:-

Section 1: Description of demographic Performa using frequency and percentage.

Section 2: Effectiveness of structured teaching program (STP) on knowledge level by paired„t" test.

Section 3: Association between knowledge score and selected demographic variables using Chi-square test.

Ethical consideration

The proposed study was conducted after the approval of the ethical committee of Mayurakshi College of Nursing. Permission was obtained from principals of selected nursing colleges s at Bangalore. Consent of each subject was obtained before starting data collection. Assurance was given to them that anonymity of each individual would be maintained.

RESULTS

Table-1 Showing the distribution of their demographic variable's (N=50)

Demographic variables	Frequency	Percent
1. Age of students in year		
A. 17 – 20 years	23	46.0
B. 21 – 24 years	23	46.0
C. 25 – 28 years	4	8.0
D. 29 – 35 years	0	0.0
2. Gender		
A. Male	26	52.0
B. Female	24	48.0
3. Religion		
A. Hindu	29	58.0
B. Muslim	21	42.0
4. Place of residence		
A. Rural	20	40.0
B. Urban	30	60.0
5. Type of family		
A. Joint	27	54.0
B. Nuclear	23	46.0
6. Years of study		
A. B.Sc. Nursing I year	5	10.0
B. B.Sc. Nursing II year	16	32.0
C. B.Sc. Nursing III year	13	26.0
D. B.Sc. Nursing IV year	16	32.0
7. Source regarding knowledge of information		
A. Internet	14	28.0
B. Print media	8	16.0
C. Teachers	28	56.0

Table-2 showing the pre-test and post-test knowledge score (N=50)

Knowledge level	Pre test		Post test	
	Frequency	Percent	Frequency	Percent
Adequate knowledge	26	52.0	3	6.0
Moderate knowledge	20	40.0	8	16.0
inadequate knowledge	4	8.0	39	78.0

Table-2 revealed that majority 52% of the B.Sc. nursing students had inadequate knowledge, followed by 40% had moderate knowledge and 8% had adequate knowledge regarding Bio Medical Waste Management in the pre-test. After administration of structured teaching program 78% of the B.Sc. nursing students had Adequate knowledge, followed by 16% had moderate knowledge and 6% of them had inadequate knowledge regarding Bio Medical Waste Management.

Table-3 Showing the distribution of mean, SD, df and paired t value (N=50)

Sl. No.	Knowledge aspects	Pre test		Post test		Mean difference	t Value	Df	Inference
		Mean	S D	Mean	S D				
1.	Introduction, Definition, Classification and Source Of Bio Medical Waste	1.6	0.67	2.5	0.646	0.9	0.8577	49	NS
2	Category of Bio Medical Waste	2.96	1.142	8.98	1.377	6.02	16.73	49	S
3	Purpose And Principle of Bio Medical Waste	0.7	0.614	1.66	0.519	0.96	5.93	49	S
4	Management of Bio Medical Waste	3.24	1.27	8.78	1.619	5.54	13.42	49	S
5	Treatment of Bio Medical Waste	1.5	0.646	3.3	0.886	1.8	8.227	49	S
	Overall	10	4.342	25.55	5.042	15.55	11.601	49	S

Table-3 it is evident that the obtained "t" value 11.601 is greater than the table value at 0.05 level of significance. Therefore, "t" value is found to be significant. It means there is gain in knowledge level of B.Sc. nursing student regarding Bio Medical Waste Management. This supports that structured teaching program on Bio Medical Waste Management is effective in increasing the knowledge level of B.Sc. nursing students.

Table-4 Showing the distribution of association between the post-test knowledge score and selected demographic variables (N=50)

Variables	Inadequate Knowledge	Moderate Knowledge	Adequate Knowledge	Chi square $\chi2$	Df	P value (0.05)	Inference
1. Age of students in year							
A. 17 – 20 years	2	5	16				
B. 21 – 24 years	1	1	21				
C. 25 – 28 years	0	0	4	4.878	4	9.49	NS
2. Gender							
A. Male	2	5	19				
B. Female	1	1	22	3.144	2	5.99	NS
3. Religion							
A. Hindu	2	2	25				

B. Muslim	1	4	16				
C. Christian	0	0	0				
D. Any others	0	0	0	1.74	6	12.53	NS
4. Place of residence							
A. Rural	2	4	14				
B. Urban	1	2	27	3.252	2	5.99	NS

Table 4 shows χ2 value computed between the knowledge level of B.Sc. nursing students on bio medical waste management and selected demographic variables. Variables such as Years of study and source of information were significant at 0.05 level. Variables such as Age, Gender, Religion, Place of residence and type of family, years of study, source regarding information were not significant at 0.05 level Therefore the hypothesis stated there will be significant association between knowledge of B.Sc. nursing students regarding bio medical waste management and selected demographic variables is accepted.

DISCUSSION

In this study majority 46% of the B.Sc. nursing students were aged 17-20 years, 46% were 21-24 years old, and remaining 8% of them were 25-28 years. Majority of the B.Sc. nursing students were males (52%) and remaining were girls (48%). Majority 58% of the B.Sc. nursing students belong to Hindu religion, 41% belongs to Muslim religion. 40% of the B.Sc. nursing students has living in rural areas, 60% the B.Sc. nursing students has living in urban areas. Majority 54% of the B.Sc. nursing students were living in joint family and remaining 46% were living in nuclear families. 10% students are studying in B.Sc. nursing First year, 32 % students are studying in B.Sc. nursing second year, 26 % students are studying in B.Sc. nursing Third year, 32% students are studying in B.Sc. nursing Forth year. 28% of the B.Sc. nursing students got information from internet, 16% got information from print media and remaining 56% of them got information from teachers.

Majority 52% of the B.Sc. nursing students had average knowledge and 40% had good knowledge and remaining 8% B.Sc. nursing students have adequate knowledge regarding Bio medical waste management in the pre test. After administration of structured teaching program 78% of the B.Sc. nursing students had adequate knowledge and 16% of them had good knowledge and remaining 6% have average knowledge regarding Bio medical waste management.

The overall mean ± SD of pretest knowledge score obtained by the B.Sc. nursing students was 10± 4.342 and mean percentage of 33.33%. The overall mean of post test knowledge score obtained by the B.Sc. nursing students was 25.55± 5.042 and mean percentage of 85.16%. It was evident that there was a statistically significant association between the knowledge scores of the B.Sc. nursing students with demographic variables such as age, sex, religion, source of information, family type, years of study, place of residence at the probability level of $p<0.05$. Hence the research hypothesis stated that there will be significant association between the knowledge scores of the B.Sc. nursing students regarding the Bio medical waste management with selected demographic variable was accepted

CONCLUSION

The following conclusions were drawn on the basis of the present study to assess the effectiveness of structured teaching program on knowledge regarding Bio medical waste management among the B.Sc. nursing students studying in selected colleges of Nursing at Jodhpur. This section brings about the limitations of the study into practice. The findings of the study have several implications on nursing practice, nursing administration, nursing education and nursing research. The study shows that the students are having inadequate knowledge regarding Bio medical waste management.

REFERENCES

1. Govt of India, Biomedical waste [management & handling] Rules. 1998 Extraordinary, Part II, Section 3, sub section [ii], the gazette of India, No-460, 27 Jul

2. Hedge V, Kulkarni RD, Ajantha GS. Biomedical waste management. Journal of MaxillofacPathol 2007;11:5-9.

3. Hem Chandra, Hospital Waste an Environmental Hazard and Its Management, (1999)

4. Govt. of India, Ministry of Environment and Forests Gazette notification No 460 dated July 27, New Delhi: 1998: 10-20

5. Glenn, Mc.R&Garwal, R. Clinical waste in Developing Countries. An analysis with a Case Study of India, and a Critique of the BasleTWG Guidelines (1999)

6. Rao SK, ranyal SK, Bhatia SS, Sharma VR (2004): biomedical waste management, An infrastructal survey of hospitals, MJAFI vol. 60(4).

7. Kishore J, Joshi TK, Sagar B. Bio-medical Waste Management for nursing professionals. The Nursing Journal of India. 2000 June1; 41(6):129-31.

8. Govt. Of India. Biomedical waste (Management and Handling) Rules, 1998.

9. Extraordinary, Part II. Section 3. Subsection (ii). The Gazette of India. r. 460.

10. Bhattacharya S, Dalal BS. Hepatitis B viral infection amongst hospital personnel in Calcutta. Ind J Public Health 2001; 45:135-6.

11. Kishore J. The problems of hospitals. Deccan Herald 1996 Feb 17; Sec. B: 5(col).

12. Ministry of Environment and forest notification on the Bio-Medical Waste (Management and Handling) Rules, 1998.

13. Central Pollution Control Board. Manual or hospital waste management CPCB. March2000. Ministry of Environment and Forest. Delhi.

14. Government of India. Biomedical Waste (Management and Handling) Rules. 1998. Extraordinary, Part II, Section3, Subsection (ii). The gazette of India, No. 460,27 Jul 1998.

15. Satpathy S, Pandhi RK. Manual for Hospital Waste Management at AIIMS Hospital, New Delhi, 1998.