ijNr

Research Article

# Effectiveness of Structured Teaching Program on Knowledge Regarding Biomedical Waste Management among 1st Year B. Sc. Nursing Students of Selected Nursing Colleges at Bangalore

**Asha Sajji, Maya Vadagaonkar**

Department of Nursing, JJT University, Jhunjhunu, Rajasthan, India

## Abstract

**Background:** Waste produced from the health-care facilities is deleterious and hazardous. Inadequate understanding and improper handling of biomedical waste can give rise to serious threat not only to the health of health-care personnel but also the society and environment as whole.

**Objective:** The objective of this study was to determine the efficacy of structured teaching program on knowledge regarding biomedical waste management.

**Materials and Methods:** A pre-experimental one group pre-test post-test study was conducted among 60 1st year basic B.Sc. nursing students who were chosen using a purposive sampling technique. A pre-test was conducted using a self-administered knowledge questionnaire with 30 items followed by which structured teaching program was conducted. Post-test was conducted after 1 week using afore-mentioned questionnaire.

**Results:** The findings of the present study revealed that, in pre-test, majority 87% subjects under study had inadequate knowledge, 10% had moderately adequate knowledge, and only 3% participants had adequate knowledge. In post-test, majority 78% study subjects had adequate knowledge, 22% had moderately adequate knowledge, and no one remained with inadequate knowledge regarding biomedical waste management. There was a significant difference between the mean scores of knowledge of nursing students regarding biomedical waste management as the "t" value obtained 29.932 was higher than the tabulated value at $P < 0.05$ level of significance.

**Conclusion:** Teaching program is effective in creating the awareness and improving the knowledge of the study participants regarding biomedical waste management.

**Keywords:** Biomedical waste management, effectiveness, evaluate, structured teaching program

## Introduction

Every human activity produces waste which needs to be disposed off in a proper way. The waste generated from the industries, sewage, and agriculture may pollute the air, water, and soil, and also, it can be dangerous to health. Although the hospitals are the centers where patients are been treated and they are cured from diseases, the waste generated from these places is infectious and may cause serious threat to the health of people those who handle it or come in contact with it. Biomedical waste management is a major concern in every health-care providing facility. It is a social responsibility. Biomedical waste is defined as 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.[1] Biomedical waste can be solid or liquid which may include discarded blood and blood products, body tissues, used bandages and dressings, discarded gloves, etc., which can transmit infectious diseases.

**Date of Submission:** 10 November 2022
**Date of Revision:** 15 November 2022
**Date of Acceptance:** 18 November 2022

| Access this article online |
| --- |
| **Website:** http://innovationalpublishers.com/Journal/ijnr |
| **ISSN No:** 2454-4906 |
| **DOI:** 10.31690/ijnr.2022.v08i04.001 |

**Address for Correspondence:** Asha Sajji, Department of Nursing, JJT University, Jhunjhunu - 333 001, Rajasthan, India. E-mail: ashasajji@gmail.com

According to the Ministry of Environment and Forests, gross generation of BMW in India is 405,702 kg/day of which only 291,983 kg/day is disposed, which means that almost 28% of the wastes is left untreated and not disposed finding its way in dumps or water bodies and re-enters our system.[2] The most common problems associated with health-care waste are the absence of waste management facilities, lack of awareness about their health hazards, insufficient financial and human resources for proper management, and poor control of waste disposal to protect the environment and health of the community. It is essential for health-care providers to be aware about the health hazards of the biomedical waste in the workplace. It is evaluated that 10–25% of the healthcare waste produced is dangerous and presents physical, chemical, and/or microbiological hazard to everybody and healthcare workers related with handling, segregation, treatment, and destruction of waste.[3] Maximum of the biomedical waste is contributed from the hospitals and nursing homes. The hazardous impact of medical waste on the public and environment is enhanced manifold if adequate and appropriate handling of these wastes is not adopted.[4]

Nurses are at high risk of developing nosocomial infections produced from the biomedical waste, as they are with the patients round the clock. Hence, it is very much important that the nurses must be well equipped with updated information, skills, and practices in proper handling and management of infectious waste to safeguard ones health.

Teaching institutes play a very crucial role in imparting the proper information and educating the health-care professional students regarding the importance of biomedical waste management. They must be made aware about the health hazards caused from the biomedical waste and educated about the proper technique and methods of handling, and safe disposal of infectious waste. Hence, the investigator felt that the nursing students must be made aware and educated through teaching program to equip themselves with the latest information on skills and practices related to biomedical waste management.

### Objectives

The objectives of this study were as follows:

1. To assess the existing level of knowledge regarding biomedical waste management
2. To determine the effectiveness of structured teaching program on knowledge regarding biomedical waste management
3. To assess the post-test level of knowledge regarding biomedical waste management.

## Materials and Methods

This study was carried out using a pre-experimental one group pre-test post-test design at RajaRajeswari College of nursing, India. A purposive sampling technique was used to select the sample of 60 1st year B.Sc. nursing students. The students those who had undergone training program on biomedical waste management were excluded from the study. Ethical approval was obtained from the Institutional Ethical Committee. Informed consent was obtained from all the participants after assuring that the responses obtained from them would be kept confidential. A pre-tested structured questionnaire was distributed to the study participants and was provided with 30 min to answer the questions. Following this, a structured teaching program was conducted for the participants regarding biomedical waste management for 45 min. They were made aware about the importance of biomedical waste management. A post-test was conducted after 1 week to know the effectiveness of the teaching program and the level of retention of knowledge regarding biomedical waste management using afore-mentioned questionnaire. Responses were scored as 1 point for correct answer and 0 point for incorrect answer. The knowledge questionnaire contained multiple choice questions divided under three sections, namely, knowledge regarding concept and meaning of biomedical waste, biomedical waste management, and precautions during biomedical waste management. The obtained data were entered in Excel Sheet and analyzed.

## Results and Interpretation

This investigation was undertaken among 60 students studying B. Sc. Nursing course intended at determining their knowledge regarding biomedical waste management. Table 1 revealed the sociodemographic variables, where majority of the study participants 70% were 19-year old with 63.3% being females

**Table 1: Frequency and percentage distribution of nursing students according to their demographic variables *n*=60**

| Demographic variables | Frequency | Percentage |
|---|---|---|
| Age | | |
| 19 years | 42 | 70 |
| 20–21 years | 16 | 26.7 |
| 22–23 years | 2 | 3.3 |
| 24 years and above | 0 | 0 |
| Gender | | |
| Ma le | 22 | 36.7 |
| Female | 38 | 63.3 |
| Religion | | |
| Hindu | 23 | 38.3 |
| Christian | 34 | 56.7 |
| Muslim | 3 | 5 |
| Others | 0 | 0 |
| Type of family | | |
| Nuclear | 39 | 65 |
| Joint | 17 | 28.3 |
| Extended | 4 | 6.7 |
| Place of residence | | |
| Rural | 15 | 25 |
| Urban | 30 | 50 |
| Semi-urban | 15 | 25 |
| Income of parents per month | | |
| <Rs. 10,001/- | 20 | 33.3 |
| Rs. 10,001/-–Rs. 20,000/- | 22 | 36.7 |
| Rs. 20,001/-–Rs. 30,000/- | 6 | 10 |
| >Rs. 30,001/- | 12 | 20 |

**Table 2: Comparison of pre-test and post-test knowledge scores *n*=60**

| S. No. | Level of Knowledge | Pre-test | | Post-test | |
|---|---|---|---|---|---|
| | | Frequency | Percentage | Frequency | Percentage |
| 1 | Inadequate (<50%) | 52 | 87 | 0 | 0 |
| 2 | Moderately adequate (50–75%) | 6 | 10 | 13 | 22 |
| 3 | Adequate (>75%) | 2 | 3 | 47 | 78 |

**Table 3: Level of knowledge regarding biomedical waste management (*n*=60)**

| Level of knowledge | Mean | SD | Paired "t" value | *P*-value |
|---|---|---|---|---|
| Pre-test | 13.28 | 2.8 | 29.932182*** | *P*<0.00001 |
| Post-test | 22.73 | 1.94 | | |

***-Highly Significant at *P*<0.05

among them and 56.7% were belonging to Christian religion. About 65% of the respondents belonged to nuclear family. About 50% respondents were residents of urban area with 36.7% having a family income of Rs. 10001/-–Rs. 20000/- per month.

Table 2 shows that responses obtained from the participants regarding level of knowledge demonstrated significant changes between the pre-test and post-test scores. Notable improvement in knowledge level was observed in aspects such as knowledge regarding biomedical waste management and precautions during biomedical waste management.

Table 3 depicts the mean and standard deviation of knowledge scores of nursing students regarding biomedical waste management. Findings of the study showed that there was significant increase in the mean scores of knowledge responses from pre-test to post-test with 13.28 ± 2.8 and 22.73 ± 1.94, respectively, which indicated a statistically (significant p<0.05) increase in knowledge scores after the intervention.

### Limitations of the study

1. Sample size was limited to 60 participants
2. Study included only students studying 1st B. Sc nursing course.

### Recommendations

1. Study can be done on larger sample size
2. Comparative study can be conducted on medical and non-medical students.

## Discussion

The present study showed that, in pre-test, majority 87% of the study participants had inadequate knowledge, 10% had moderately adequate knowledge, and only 3% of the study participants had adequate knowledge. In post-test, majority 78% of the participants had adequate knowledge, 22% had moderately adequate knowledge, and no one was left with the inadequate knowledge. Comparable findings were reported in a study conducted by Jyoti Srivastava, where 76% of the study participants had average knowledge in pre-test and was increased to 100% in post-test after the intervention indicating that the planned teaching program was highly effective in increasing the knowledge.[5] Karth *et al*. reported that the structured teaching program was highly effective in increasing the knowledge of study participants regarding biomedical waste management. Chiinhoiching reported that the planned teaching program was effective in increasing the knowledge of the study participants.[4] Ranjan and Asokan also reported that 66.7% participants had moderate knowledge and 30% had inadequate knowledge and no one had adequate knowledge.[7] Nagaraju *et al*. found that 65% of the study participants had average knowledge and also reported that the health workers are having lack of knowledge regarding biomedical waste management.[8] Mathur *et al*. conducted a cross-sectional study on health-care personnel regarding their knowledge, attitude, and practices related to biomedical waste management and found that study participants had better knowledge, but the sanitary staff was having lack of knowledge and the practices related to biomedical waste management were not satisfactory which indicated the importance and need of training about biomedical waste management.[9] Sahu *et al*. conducted a study to compare the effectiveness of structured teaching program and video-assisted teaching program on knowledge regarding biomedical waste management and found that the structured teaching program was more effective than the video-assisted teaching program in increasing the knowledge of the study participants.[10] Comparable results were reported by Pattan, as 56.66% of the study participants had average knowledge, 20% had poor knowledge, and only 23.33% had good knowledge in pre-test and in post-test all the study participants exhibited good knowledge indicating the effectiveness of teaching program.[11]

## Conclusion

Thus, the authors concluded that the study participants had lack the knowledge regarding biomedical waste management which, in turn, poses threat to the health of the health-care professionals as well as the society in large. The structured teaching program in the present study was effective in improving the knowledge of the participants regarding biomedical waste management. Hence, conducting more educational programs to improve, the knowledge and create awareness about the importance of proper management of biomedical waste is the need of the hour.

## Acknowledgment

We are grateful to RajaRajeswari college of nursing for permitting to carry out the study and also thankful to the ethical

committee of the institution for giving ethical clearance to conduct the study. Furthermore, we would like to thank all the study participants for their cooperation throughout the study.

## Conflicts of Interest

None.

## Source of Funding

This work received no funding from any source.

## Ethical approval

Approved.

## References

1. Singh Z, Bhalwar R, Jayaram J, Tilak VW. An introduction to essentials of bio-medical waste management. Med J Armed Forces India 2001;57:144-7.
2. Hirani DP, Villaitramani KR, Kumbhar SJ. Biomedical waste: An introduction to its management. Int J Innov Res Adv Eng 2014;1:82-7.
3. Nayak R, Swain M. Effectiveness of structured teaching programme on biomedical waste management among student nurses. Int J Health Sci Res 2020;10:274-9.
4. Chiinhoiching M, Pillai K. Effectiveness of planned teaching program regarding bio-medical waste management in terms of knowledge among B.Sc nursing 2nd years students. Ann Rom Soc Cell Biol 2021;25:18716-22.
5. Srivastava J. Knowledge regarding biomedical waste management among the staff. Int J Sci Res 2016;5:1714-7.
6. Karth R, Kumuthavalli D, Brindha M, Mahalakshmi G, Padmapriya P, Priya V, *et al*. Effectiveness of structured teaching programme on knowledge regarding bio-medical waste management among GNM students in selected school of nursing. Galore Int J Health Sci Res 2020;5:59-64.
7. Ranjan R, Asokan R. A study to assess the knowledge, attitude and practice of undergraduate nursing students on bio-medical waste management at selected nursing college in Bhubaneswar. Int J Trend Sci Res Dev 2019;3:421-5.
8. Nagaraju B, Padmavathi GV, Puranik DS, Shantharaj MP, Sampulatha SP. A study to assess the knowledge and practice on bio-medical waste management among the health care providers working in PHCs of Bagepalli Taluk with the view to prepare informational booklet. Int J Med Biomed Res 2013;2:28-35.
9. Mathur V, Dwivedi S, Hassan M, Misra RP. Knowledge, attitude, and practices about biomedical waste management among healthcare personnel: A cross-sectional study. Indian J Community Med 2011;36:143-5.
10. Sahu N, Sahu B, Sahu P, Pandram D, Sahu N, Thakur C. A comparartive study to evaluate the effectiveness of structured teaching programme and video assisted teaching programme on knowledge regarding biomedical waste management. RFP J Hosp Adm 2019;3:49-52.
11. Pattan AD. A study to evaluate the effectiveness of planned teaching programme on knowledge regarding biomedical waste management among B.Sc. 3rd year nursing students of K.L.E. university institute of nursing science, Belgaum, Karnataka. Int J Nurs Crit Care 2015;1:10-3.

**How to cite this article:** Sajji A, Vadagaonkar M. Effectiveness of Structured Teaching Program on Knowledge Regarding Biomedical Waste Management among 1st Year B. Sc. Nursing Students of Selected Nursing Colleges at Bangalore. Int J Nur Res. 2022;8(4):123-126.