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Effectiveness of Planned Teaching Program Regarding Bio-Medical Waste Management in Terms of Knowledge among B.Sc Nursing 2nd Year Students

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ABSTRACT

Background: The waste produced in the course of healthcare activities carries a higher potential for infection and injury than any other type of waste. Inadequate and inappropriate knowledge of handling of healthcare waste may have serious health consequences and a significant impact on the environment as well.
Materials and Methods
A convenient sampling technique was used to select 60 B.Sc Nursing 2nd year students. A knowledge questionnaire was administered to assess the knowledge of the selected samples. The collected data was analysed by using descriptive and inferential statistics. Frequency and percentage distribution was used for demographic variables and assessing pre-test and post-test knowledge regarding biomedical waste management. Chi-square test was used to analyse . association between post-test knowledge adopte regarding biomedical waste management with selected Demographic variables.
RESULTS
By using statistical analysis, the study revealed that 6.7% has inadequate, 68.3% has moderate and 25% has adequate knowledge in pre-test and 0% has inadequate, 3.3% has adequate, 96.7% has adequate knowledge in post-test regarding Bio Medical waste management. There was a significant difference between mean scores of knowledge as the 't' value obtained 16.171 is higher than the tabulated value 2.00 at 0.05 level of significance. The post-test knowledge scores regarding Bio Medical Waste management was not associated with demographic variables (age, gender, educational qualification, attended any workshop/seminars on biomedical waste management) as chi square value was found to be statistically significant at 0.05 level of significance
Conclusion
The importance of training regarding biomedical waste management needs emphasis; lack of proper and complete knowledge about biomedical waste management impacts practices of appropriate waste disposal.

Keywords
Assess, Effectiveness, Bio-medical waste management, Planned Teaching Program.

Introduction

In developing countries like India the waste is carried to the outskirts of the city and dumped indiscriminately in a most in-sanitary way. In addition to this, new health care . Institutions are built without any consideration for waste handling and management. India approximately generates 2 kg/bed/ day [1] and this biomedical waste encompasses wastes like anatomical waste, cytotoxic wastes, sharps, which when inadequately segregated could cause different kinds of deadly infectious diseases like Human immunodeficiency virus (HIV) hepatitis C and B infections, etc, and also cause disruptions in the environment, and adverse impact on ecological balance[2]. As per the act passed by the Ministry of Environment and Forests in 1986 & notified the Bio Medical Waste (Management and Handling) Rules in July 1998, it is the duty of every "occupier", i.e. a person who has the control over the institution or its premises, to take all steps to ensure that waste generated is handled without any adverse effect to human health and environment. In India, the cumulative incidence of nosocomial infections was 1.6 infections per 100 patients in six months or 3.6 infections per 1000 in-patient days. The estimated prevalence of Hospital Acquired Infections is 4.5% corresponding to 9.3 infections per 1000 patient- days[3].

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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[5]. Unmanaged hospital waste constitutes hazards to human body through different routes of exposure thus cause ill health and economic loss. Hospital wastes have been known to have serious implication on the health and environment where they are not properly managed as a result, the impacts of Hospital Waste Management on the Health and Environment needed to be assessed for proper recommendation. Hence, this study assessed waste management practices in different hospitals (Public or Primary Health Centre, Private and Referral Hospitals) as they affects health and environment.[3]

Teaching institutes play a critical role in the health care setup as it is from these places that the future health care professionals and all those persons involved in the care giving to the community are trained.[4] Adequate knowledge about the health hazard of hospital waste, proper technique and methods of handling the waste, and practice of safety measures can go a long way toward the safe disposal of hazardous hospital waste and protect the community from various adverse effects of the hazardous waste. With this background, the study was carried out to assess the current knowledge among B.Sc Nursing 2nd year students with regard to the management of Bio-medical waste management.

NEED OF THE STUDY

The problem of bio-medical waste disposal in the hospitals and other healthcare establishments has become an issue of increasing concern, prompting hospital administration to seek new ways of scientific, safe and cost effective management of the waste, and keeping their personnel informed about the advances in this area. The need of proper hospital waste management system is of prime importance and is an essential component of quality assurance in hospitals. Adequate knowledge about the health hazard of hospital waste, proper technique and methods of handling the waste, and practice of safety measures can go a long way towards the safe disposal of hazardous hospital waste and protect the community from various adverse effects of the hazardous waste. With this background, a study was conducted with the main objectives of assessing knowledge of 60 B.Sc Nursing 2nd year students regarding health care waste management.

STATEMENT OF THE PROBLEM

A pre-experimental study to assess the effectiveness of Planned Teaching Program on Biomedical waste management in terms of knowledge among B.Sc Nursing 2nd year students of SGT University at Gurugram, Haryana

OBJECTIVES OF THE STUDY

1. To assess the level of pre-test knowledge regarding biomedical waste management among B.Sc Nursing 2nd year students.
2. To develop a planned teaching program regarding biomedical waste management among B.Sc Nursing 2nd year students.
3. To evaluate the effectiveness of planned teaching program regarding biomedical waste management in terms of increase in level of knowledge among B.Sc Nursing 2nd year students.
4. To determine the association between post-test knowledge regarding biomedical waste management with selected demographic variables.

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REVIEW OF LITRATURE

1. **Divya Rao, M. R. Dhakshaine, Ameet Kurtheekoti and Vidya G. Doddawad (2018)** conducted a cross sectional study to assess the current knowledge, attitude and practices of the health care workers like doctors, post graduates, interns, staff nurses, laboratory technicians and house-keeping staff in a tertiary care teaching hospital . The tool used for the study was a pre-tested, semi-structured closed ended questionnaire which encompassed 42 questions on Knowledge, Attitudes and Practices. Results were found that the knowledge regarding general information about HCW was assessed, the mean score was highest in doctors (10%) followed by nursing staff (9.3%) and least in housekeeping staff (7.5%).The mean attitude score was 9.20% for the nurses and 9.18% out of 10% for the doctors.[5]
2. **T Deress (2018)** conducted across-sectional study and data were collected through structured self-administered questionnaire and observational checklist. Result of the showed that the out of 296 healthcare professionals studied, 168 (56.8%), 196 (66.2%), and 229 (77.4%) had adequate knowledge, favorable attitude, and adequate practice score, respectively. Regarding associated factors, M.Sc and MD+ (AOR: 4, 95% CI: (1.37, 149.52), B.Sc holders (AOR: 2.53, 95% CI: (1.47, 4.38), and availability of color-coded bins (AOR: 7.68, 95% CI: (3.30, 17.89)) were identified more likely to contribute for adequate knowledge, favorable attitude, and adequate practice scores, respectively. The level of knowledge, attitude, and practice scores were not satisfactory. [6]
3. **P.V. Srinivasa Kumar, P. Padmaja (2017)** conducted a study to assess the Knowledge, attitude, practices about BMW among nursing students. Total 147 nursing students were selected randomly, a structured valid questionnaire of Bio Medical Waste related framed by us were disturbed to them. The respondents were asked to return the questionnaire immediately after answering. All the results were entered into spread excel sheet and analysed. Results were expressed as number, percentages. Results: Third year students answered better than first year and second year students towards KAP of Bio Medical Waste management. Out of 54 third year students, 88.8% gave correct answers to knowledge questionnaire, 79.6% and 74% responded well to attitude and practice questionnaire. Out of 147 nursing students, 14.2% of first year, 21.7% of second year, 32.6% of third year students gave correct answers to knowledge questionnaire. It was observed that higher education and clinical rounds are needed for nursing students to increase the knowledge of bio medical waste management activities.[7]
4. **Rajiv Kumar, Anil Kumar Gupta, Arun Kumar Aggarwal and Ashok Kumar (2014)** conducted a descriptive study on evaluation of bio-medical waste management in a tertiary care public hospital of North India. Checklist method was used to evaluate the study. The overall mean percentage score for BMW management at source of generation of waste was 88%. Category-wise, the mean percentage score of 'condition of receptacles' was 87%, 'waste segregation' was 96%, 'mutilation of recyclable waste' was 88% and 'disinfection of waste' was 81%. Area-wise, the mean percentage score of Emergency was 88%, Central Waste Collection Points of Wards' was 89%, 'Treatment Room of Wards' was 81%, OTs was 90% and ICUs was 92%.[8]

MATERIAL AND METHODS

The study was conducted from December 2018 – September 2020 .A quantitative approach with pre experimental design was adopted for the study. Total of 60 students who met the inclusion criteria were selected using Non probability Convenient sampling technique. Structured knowledge questionnaire were used to assess the knowledge and regarding Biomedical waste

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management. Knowledge questionnaire includes 25 questions. Reliability of the tool was established by Kuder Richardson20 (KR20) method, r is 0.98 and reliability of the tool was between 0.7- 0.1..Ethical approval was obtained from DRC and the ethical committee concerned heads of the selected Nursing institution. Written informed consent was taken from the participants prior to data collection. The data was analyzed and interpreted in terms of objectives of the study. Descriptive and inferential statistics were utilized for the data analysis. A p value $\leq$ 0.5 was considered as significant for the present study.

FINDINGS

The findings of the study indicated that in pre test Knowledge score 6.7% students has inadequate knowledge, 68.3% has moderate knowledge and 25% has adequate knowledge. In post test knowledge 58% (96.7%) students has adequate knowledge, 2(3.3%) has moderate knowledge and 0 (0%) has inadequate knowledge regarding Biomedical Waste Management. Hence, it concluded that students have adequate Knowledge regarding biomedical waste management after administration of planned teaching programme .

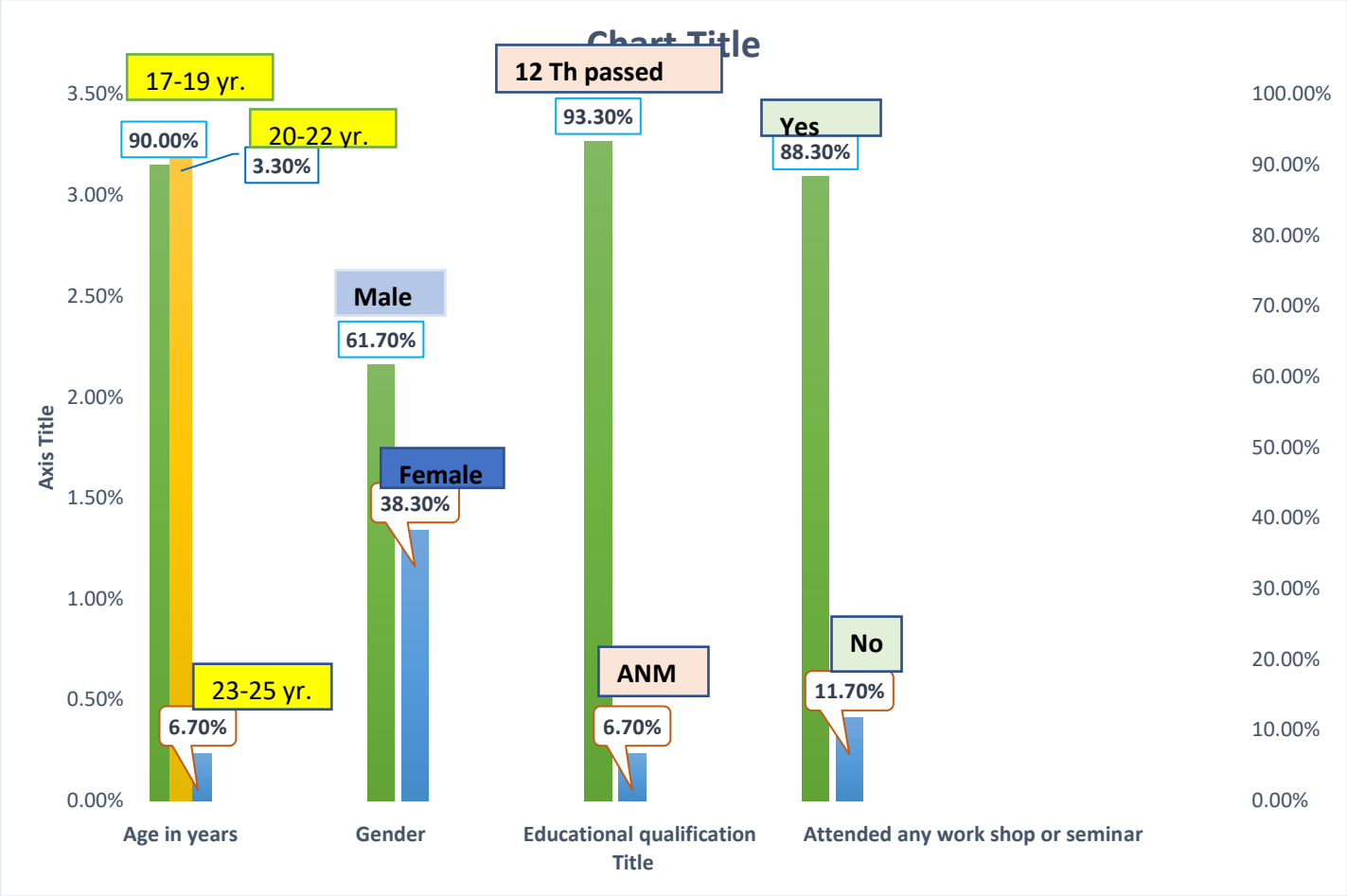

Figure No. 1 Bar Diagram showing percentage distribution of sample characteristics.

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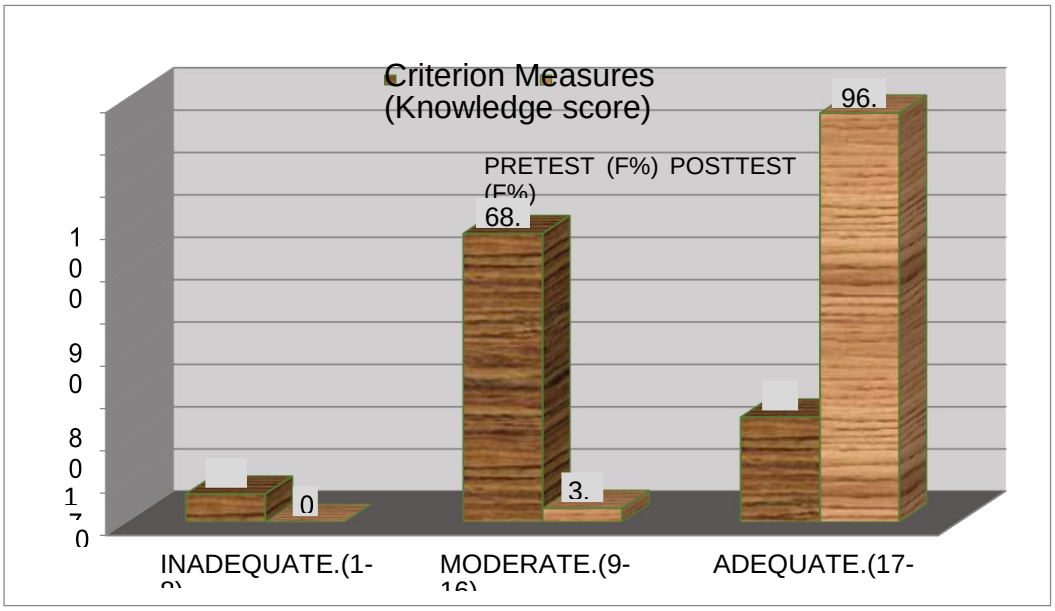

Figure 2: Percentage distribution of pre-test and post-test knowledge score

The above figure shows the criterian measure knowledge scores of pre-test and post-test where there is improvement in post test score as compared to pretest scores i.e. pre-test adequate scores=25% but in the case of post-test it is96.7% and in the case of inadequate knowledge it has decreased to 0%, i.e. Pre-test score of inadequate knowledge = 6.7% and post test score is 0% which shows that the planned teaching program was effective .

DISCUSSION

The research findings of the present study "A pre-experimental study to assess the effectiveness of planned teaching program regarding biomedical waste management in terms of knowledge among B.Sc Nursing 2nd year students studying at SGT University, Gurugram, Haryana".

- **First Objective:** To assess the knowledge regarding biomedical waste management among B.Sc Nursing 2nd year students. According to pre-test score 6.7% has inadequate knowledge, 68.3% has moderate knowledge and 25% has adequate knowledge regarding biomedical waste management among B.Sc Nursing 2nd year students in pre-test.

- **Second Objective:** To develop a planned teaching programme regarding biomedical waste management among B.Sc Nursing 2nd year students. Lesson plan and Power Point Presentation were made.

- **Third Objective:** To evaluate the effectiveness of planned teaching program regarding biomedical waste management in terms of increase in level of knowledge among BSc Nursing 2nd year students. According to data analysis and interpretation , there is a significant difference between mean scores of knowledge as the 't' value obtained 16.171 is higher than the table value 1.9949 at 0.05 level of significance for 69 degree of freedom. Hence, it can be inferred that the obtained mean difference of 7.700 is not by chance but is a true difference,

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thus research hypothesis(H1) was accepted. So, it can be concluded that planned teaching programme was effective in improving the knowledge among BSc Nursing 2nd year students regarding biomedical waste management in pre-test.

- **Fourth Objective:** To determine the association between post-test knowledge score with selected demographic variables.According to association of post-test knowledge score on biomedical waste management, there is no association between knowledge score and demographic variable.

CONCLUSION

Major findings showed that 15(25%) has adequate knowledge in pre-test and 58 (96.7%) has adequate knowledge in post-test regarding biomedical waste management. The data analysis and interpretation showed that there is significant difference between mean score of knowledge as the "t" value obtained 16.171 is higher than the tabulated value 2.00 at 0.005 level of significance. Hence, it can be inferred that obtained mean difference of knowledge 7.700 is not by chance but a true difference, thus research hypothesis was accepted. So it can be concluded that the planned teaching program was effective in increasing the knowledge regarding biomedical waste management among BSc Nursing 2nd year students studying in SGT University, Gurugram, Haryana.

IMPLICATION

NURSING EDUCATION

The study has important implication in the nursing education and other fields. One of the leading functions of nursing is to impart education with newer knowledge. The present study emphasize that the planned teaching program was effective in increasing the knowledge regarding biomedical waste management. By education the nursing students they can provide efficient and competent knowledge. This study helps the nurse educator to use structured knowledge questionnaire .

NURSING RESEARCH

A very few interventional studies have been done in the hospital for assessing the knowledge of nursing students regarding biomedical waste management. New evidence based information becomes available everyday on this subject. It is vital that student researcher update their knowledge constantly and are always willing to examine and alter their practice in the light of newly published evidence. More research is needed to delineate specific assessment parameters and interventional techniques New methods and techniques of teaching and learning have to be implemented in the educational research as well as the clinical research, which is challenging task in the era of improving science and technology. The study will motivate the new researchers to conduct the same study with different variables.

NURSING PRACTICE

Nurses are the backbone of the health care set up of any country. The nursing practice has gone many evolutions in the recent past. The expanded role of professional nurse emphasizes the activities which provide promotive, preventive, curative and rehabilitative aspects. Nurses play an important role in disease prevention and health promotion. Health information and knowledge on biomedical waste management can be imparted via various methods like mass media, lecture, planned teaching program, structured teaching program and display. The nurses can improve the knowledge regarding biomedical waste management by updating their knowledge by reading journals and new innovations in nursing practice and clinical field. Evidence based practice is the

need of todays practice. Based on evidence, nursing practice regarding biomedical waste management can be improved and modified in terms of knowledge and skills.

NURSING ADMINISTRATION

Nursing administrator may use the finding to improve the quality of care in the hospitals as well as in community nursing. The concept of extended nurse role has many opportunities for a nurse administrator to improve the quality of life of public and the health care professional.

RECOMMENDATIONS :

- Similar study can be undertaken on a large sample for making a more valid generalization
- Study can be conducted on different samples
- A comparative study can be conducted to assess effectiveness of planned teaching program with other instructional methods
- A correlation study can be conducted to analyse the knowledge of students regarding biomedical waste management.

ETHICAL CONSIDERATION

Ethical approval to conduct this study was obtained from DRC and the ethical committee of the Faculty of Nursing , SGT University.

Conflict of interest – There is no conflict of interest among the authors.
Source of funding – Self

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