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Assess the effectiveness of structured teaching program on bio medical waste management among staff nurses working in scpm multi-speciality hospital Gonda (Uttar Pradesh)

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Abstract
Introduction: Biomedical waste (BMW) is any waste produced during the diagnosis, treatment, or immunization of human or animal research activities pertaining thereto or in the production or testing of biological or in health camp. Only about 10%–25% of BMW is hazardous, and the remaining 75%–95% is non-hazardous. The hazardous part of the waste presents physical, chemical, and/or microbiological risk to the general population and health-care workers associated with handling, treatment, and disposal of waste. It also created one significant problem improper handling of the medical waste produced in the testing and treatment of the disease. In India, BMW generated due to COVID-19 contributed to about 126 tonnes per day out of the 710 tonnes of waste produced daily.
Methodology: in current study is pre-experimental one group pre-test and post-test research design and the sample was consisting 30 nursing staff were selected using by convenient sampling technique to collect the data. Data was collected using a self-structured questionnaire. After collection of data, the data was analysed by using inferential statistics such as chi-square and paired "t" test to determine association.
Results: in this study results revealed that 60% had average knowledge score, 30% excellent knowledge score, and, 10% had poor knowledge score during the pre-test knowledge score. After that the administration of structured teaching programme the post-test knowledge were 83.3% had excellent knowledge score and, least most 16.7% had average knowledge score regarding the BMW management.
Discussion: The calculated 'T' value was greater than the table value at 0.05 level of significance. Hence the null hypothesis was rejected indicating that the gain in knowledge of staff nurses through the structure teaching program on Bio Medical Waste Management was significant. --Chi- square computed between mean pre-test knowledge scores and selected variables showed that there was no significant association between the knowledge scores and demographic variables except for experience of the staff nurses (χ 2 '= 41.276; P<0.05). Therefore, the research hypothesis H2 has been accepted.

Keywords: BMW, Nursing Staff, Hospital, COVID-19

Introduction

Biomedical waste (BMW) is any waste produced during the diagnosis, treatment, or immunization of human or animal research activities pertaining thereto or in the production or testing of biological or in health camps [1]. It follows the cradle to grave approach which is characterization, quantification, segregation, storage, transport, and treatment of BMW. The basic principle of good BMW practice is based on the concept of 3Rs, namely, reduce, recycle, and reuse [2]. The best BMW management (BMWM) methods aim at avoiding generation of waste or recovering as much as waste as possible, rather than disposing. Therefore, the various methods of BMW disposal, according to their desirability, are prevent, reduce, reuse, recycle, recover, treat, and lastly dispose. Hence, the waste should be tackled at source rather than "end of pipe approach [3].

Only about 10%–25% of BMW is hazardous, and the remaining 75%–95% is non-hazardous. The hazardous part of the waste presents physical, chemical, and/or microbiological risk to the general population and health-care workers associated with handling, treatment, and disposal of waste [4]. Some examples of infections are Salmonella,

Shigella, Mycobacterium tuberculosis, Streptococcus pneumonia, acquired immunodeficiency syndrome (AIDS), hepatitis A, B, and C, and helminthic infections [5]. This systematic review is conducted to obtain essential, up-to-date information on BMW for the practical application of its management [6]. The highlight of the management of BMW is that the "success of BMW management depends on segregation at the point of generation" [7].

According to Chapter of the Medical Waste Management and Processing Rules, 2016, "The BMW could not be mixed with other wastes at any stage while producing inside hospitals, while collecting from hospitals, while transporting, and should be processed separately based on classification [8]." The COVID-19 pandemic has now transformed healthy societies worldwide into diseased ones, resulting in a very high number of deaths [9]. It also created one significant problems improper handling of the medical waste produced in the testing and treatment of the disease. In India, BMW generated due to COVID-19 contributed to about 126 tonnes per day out of the 710 tonnes of waste produced daily [9, 10].

Method and Methodology

Research Design and setting

The current study was a pre-experimental one group pre-test and post-test research design were conducted on the staff nurses working in the SCPM multi-speciality hospital, Gonda, U.P.

Research Sample and techniques

The present study was select the 30 working nursing staffs and were selected by using of non-probability convenient sampling technique.

Data collection tool

The tool were have divided into two part

Part-1st Questionnaire related to the socio-demographics variables such as, age, gender, martial status, religion, years of experience, educational qualification, area of working, source of information, designation of staff.

Part-2nd Questionnaire related to the self-structured questions to determine the knowledge of the study participants such like as, (0-8) score have poor knowledge, (9-17) score have average knowledge and, (18-25) have excellent knowledge regarding the BMW.

Data Analysis plan

The researcher was used the descriptive statistics to determine the frequency of the demographic variables and find out the means difference between the mean pre-test and post-test knowledge score regarding biomedical waste management among staff nurses, and researcher use the chi-square test to determine the association between the pre-test and selected demographic variables regarding the biomedical waste management among staff nurses.

Results

Table 1: Showing the distribution of the study participant's profile

Socio-demographic variables		Frequency	Percentage
1. Age			
A	21-25	19	63.3
B	26-30	10	33.33
C	31-35	1	3.33
D	36 and above	0	0
2. Gender			
A	Male	28	93.4
B	Female	2	6.6
3. Marital status			
A	Married	11	36.6
B	Unmarried	17	56.6
C	Divorce	2	6.66
4. Religion			
A	Hindu	19	63.3
B	Muslim	9	30
C	Others	2	6.6
5. Year of experience			
A	0-1 years	10	33.3
B	2-3 years	15	50
C	4-5 years	5	16.6
D	5 years and above	0	0
6. Qualification of staff			
A.	ANM	6	20
B.	GNM	14	46.6
C.	B.Sc. Nursing	10	33.3
D.	M.Sc. Nursing	0	0
7. Area of working			
A.	General Ward	12	40
	ICU	12	40
	Emergency ward or OPD	2	6.6
	Others	4	13.3
8. Source of information			
A	Book	19	63.3
B	Electronic media	2	6.4
C	Working/conference	4	10

D	Others	6	100
9. Family members profession in the health care sectors			
A	Nursing's	34	7
B	Paramedical	66	13.5
C	Others	388	79.5

Table-2 Showing that the majority of the study participants out of 30 sample, 60% had average knowledge score, 30% excellent knowledge score, and, 10% had poor knowledge score during the pre-test knowledge score. After that the administration of structured teaching programme the post test knowledge were 83.3% had excellent knowledge score and, least most 16.7% had average knowledge score regarding the BMW management. Hencefore the results shows that the STP have facilitates to improve the knowledge regarding the BMW management.

Table 2: Effectiveness of structured teaching programme (pre-test and post-test knowledge score)

Knowledge score	Pre-test		Post-test	
	F	%	F	%
Poor	3	10	0	0
Average	18	60	5	16.7
Excellent	9	30	25	83.3

Discussion

The major findings of the study were 63.33% of staff nurses were in the age group of 21- 25years. 33.33% of staff nurses were in the age group 26-30 years, 3.33% of staff nurses. 0% of staff nurse were in the age group of 36 and it's above. The maximum respondents 28(93.33%) were males, maximum of respondents were 2(6.66%), maximum respondents were 11(36.66%) married, 17(56.66%) unmarried, 2(6.66%) divorce. The maximum respondents were 19(63.33%) Hindu, 9(30%) muslim, 2(6.66%) others. The maximum respondents were 10(33.33%) 0-1 year experience, 15(50%) 2-3 years' experience, 5(16.66%) 4-5 years experiences, (0%) above 5 years' experience. The maximum respondents were 6(20%) ANM staff nurses, 14(46.66%) GNM staff nurses, 10(33.33%) B.Sc. nursing staff nurses, 0 (0%) M.Sc. or P.B. B.Sc. nursing staff nurses. The maximum respondents were 12(40%) staff nurses working in general ward, 12(40%) Staff nurses working in ICU, 2(6.66%) working in emergency ward or OPD, 4(13.33%) staff nurses working in other areas. The maximum respondents were 19(63.33%) Staff nurses had taken the information regarding biomedical waste management by the books, 2(6.66%) staff nurses by electronic media, 3(10%) staff nurses by working/ conference, 6(20%) staff nurses had taken by other sources. The maximum respondents were 0(0%) staff nurses were Nursing Supervisor, 4(13.33%) Staff nurses were ward in charge, 0(0%) staff nurses were floor in charge, 26(86.66%) were staff nurses. The maximum respondents were 21(70%) attended the teaching program regarding biomedical waste management, 9(30%) not attended any teaching program. --In pre-test the maximum knowledge regarding the biomedical waste management were 73.33% of them gained knowledge, 10% had inadequate knowledge, 60% had moderate adequate knowledge, 30% had adequate knowledge with mean 12.6, SD were 4.24. After post-test everyone had gained total knowledge score 93.33% with mean 23.73% and SD were 3.749. In post-test the knowledge score was 0% inadequate, 16.66% moderate adequate, 83.33% adequate knowledge regarding biomedical waste management. This shows an improvement in knowledge level after STP. The mean percentage is higher in post-test knowledge scores. --The calculated 'T' value was greater than the table value at 0.05 level of significance. Hence the null hypothesis was rejected indicating that the gain in knowledge of staff nurses through the structure teaching program on Bio Medical Waste Management was significant. --Chi- square computed between mean pre-test knowledge scores and selected variables showed that there was no significant association between the knowledge scores and demographic variables except for experience of the staff nurses (χ 2 '= 41.276; P<0.05). Therefore, the research hypothesis H2 has been accepted.

Conclusion

The study underscores the importance of structured teaching programs in enhancing staff nurses' knowledge of biomedical waste management. These findings contribute to the body of knowledge in healthcare waste management and highlight the need for ongoing training and education initiatives to ensure optimal patient care and environmental safety.

Acknowledgement

Not available

Author's Contribution

Not available

Recommendations

- A similar study can be conducted on a larger sample spread over different Hospitals.
- An true experimental study could be undertaken with a control group.
- Similar study could be conducted to develop a STP on other hospitals.
- A study can be conducted for comparison between staff nurses of two different hospitals.
- A study can be made to compare the effectiveness of STP with other methods of teaching. This study can be replicated on a larger sample to generalize the findings

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