A Case Study-Impact Evaluation of Bio Medical Waste Management Training amongst Paramedical Staff

Usha Banker: Chief Operating Officer, Saviour Hospital Ahmedabad, Gujarat& Research Scholar, JJT university, Jhunjhunu.
Dr. Nitin Shah: (M.S) Prof. of Surgery, Director- Sal Group OF Institutes, Ahmedabad, Gujarat.
Dr. M. B. Shah: (M.D), Prof. of Obst. & Gynec. Dean- Kesar Sal Medical College

Research Question: Prevailing Knowledge of BMW management of paramedical and nursing staff and impact of training?
Objectives: To evaluate the basic knowledge of BMW management of the participants and to study the impact of training in terms of change in knowledge and approach of the participants.

Sample size: Participating paramedical staff in pre and post training evaluation.

Study Design: A questionnaire was prepared which included MCQs and fill in the blanks .All trainers will asked to answer the same paper for pre and post training session. A training session was conducted by a doctor with the help of Audio visual aid which included introduction, importance, segregation, disposal and the importance of biomedical waste management.

Statistical Analysis: Statistical analysis using scoring system, mean, deviation etc. were evaluated .**t test** was applied.

Results: A result of comparison of pre and post training was eye opener. The knowledge of the participants was increases significantly improved after training programme as training improves the knowledge of employees. Impact of training is significant to adopt the system for all institutes.

Introduction

Human beings are showing to an enormous variety of health risks over their whole life. Everyday somewhat huge quantity of potentially contagious and harmful waste is generated in the healthcare hospital and amenities around the world [1]. The current developments in healthcare units are specifically made for the obstacle and safety of common health. Waste generated in the procedure of healthcare collected of multiplicity of waste including hypodermic unwarranted, scalpels, blades, surgical fiber, gloves, dressing, clothes discarded medicine and body fluid, human tissues and organs, chemicals, etc. this includes radioactive PVC plastic etc.

The present hospitals and health care institutions including research centers use a broad selection of drugs including antibiotics, cytotoxics, acidic chemicals, radioactive substance, which at last become part of hospital waste. The making of disposables in the hospital has brought in its wake, attendants, ills i.e. improper recycling, unofficial and illegal re-use and increase in the quantum of waste. All surrounding technological improvement has lead to enlarged availability of health related consumer goods, which have the tendency for production of increased wastes.

The issue of inappropriate Hospital Waste Management in India was first highlighted in writ petition in the hon'ble Supreme Court; and subsequently, pursuant to the directives of the court, the Ministry of Environment and Forests, Govt. of India notified the Bio-medical Waste (Management and Handling) Rules on 27th July 98; under the provisions of Environment Act 1986. These rules have been framed to adjust the discarding of various categories of Bio-Medical Waste as envisaged therein; so as to assurance the safety of the staff, patients, public and the environment.

In the influence of the aim of reducing health problems eliminating potential risk and treating sick people healthcare services certainly create waste which itself may be harmful to health. The waste produced in the course of healthcare activities carries a higher potential for infection and injury than any other type of waste.

Approx. 0.33 million tones of hospital waste are generated in India and the waste generation rate ranges from 0.5 to 2.0 kg/bed/day. [2]

World Health Organization states that 85% of hospital waste is actually safe where as 10% are contagious and 5% are non-contagious but they are included in harmful waste. About 15% to 35% of hospital waste is regulated as contagious waste. [3]

Bio-Medical Waste has been categorized into ten different categories as mentioned below:

Category - 1   Human Anatomical   (Human tissues, organs, body wastes parts)

Category - 2   Animal Wastes   (Animal tissues, organs, body parts carcasses, bleeding parts,Fluids, blood and experimental animals used in Research, waste Generated by veterinary hospitals, discharge from hospitals, animal houses)

Category - 3   Microbiology &
Biotechnology waste   (Waste from laboratory cultures, stocks or samples of micro organisms live or attenuated vaccines, human and animal cell culture used in research and infectious agents from research and industrial laboratories, waste from production of organic, toxins, dishes and devices used for transfer of cultures)

Category - 4   Waste Sharps   (needles, syringes, scalpels, blades, glass, etc. that may cause Puncture and cuts. This includes both used and unused sharps)

Category - 5   Discarded Medicines   (Waste comprising of outdated contaminated and discarded Medicines)

Category - 6   Solid Waste   (items contaminated with body fluids, including cotton, Dressing, solid linen, plaster casts, linen, bedding, other materials contaminated with blood)

Category - 7   Solid Waste   (Wastes generated from throwaway items other than the waste

Sharps such as tubing, catheters, intravenous sets, etc.)

Category - 8   Liquid Waste   (waste generated from laboratories and washing, cleaning, Housekeeping and disinfecting activities.

Category - 9   Incineration Ash   (Ash from incineration of bio medical waste)

Category - 10 Chemical Waste   (chemicals used in production of biological, Chemicals used in Disinfection as insecticides etc.)

Within a healthcare industry facility or hospital the main groups submitted to risk are:

- Doctors, medical nurses, healthcare unit workers and maintenance staff.
- Patients
- Visitors
- Workers in auxiliary services, laundry and medical supplies store those charged with collecting and transporting waste.
- Service workers dealing with waste treatment and disposal of health unit.

Regarding the healthcare workers three infections are most commonly transmitted Hepatitis B Virus, hepatitis C and human immunodeficiency virus HIV.

Among the 35 million health workers worldwide, about 3 million receivepercutaneous exposures to blood borne pathogens each year; two million of those to HBV, 0.9 million to HCV and 170 000 to HIV. These injuries may result in15 000 HCV, 70 000 HBV and 500 HIV infections. More than 90% of these infections arise in developing countries [4].

Insufficient and improper knowledge of handling of healthcare waste may have serious health consequences and significant impact on environment. Whenever generated a safe and trustworthy method for conduct of biomedical waste is essential effective management of Biomedical Waste is not only legal but social responsibility. The absence of proper waste management, lack of awareness about the health hazards from Biomedical Waste, insufficient financial and human resources and poor control of waste disposal are the most critical problems connected with healthcare waste [5]. There is an increased global awareness among health professional about the hazards and also proper management techniques. But the level of awareness in India is found to be unsatisfactory [6-7-8]. Adequate knowledge about the health hazard of hospital waste, proper techniques and method of handling waste and practice of safety measures can go long way towards the safe disposal of Harmful.

Hospital waste and protect the group of people from various adverse effect of Harmful waste.

The hospital waste management has varied ramification as it only not affects health of patients but also healthcare workers and general public with this background this study was conducted with the main objective of to evaluate the basic knowledge of biomedical waste management of participants and to study the impact of training in terms of change in knowledge and approach of participants.

Materials and Methodology:

The cross sectional study was conducted as a part of a larger study of assessing knowledge for bio medical waste management amongst medical and paramedical staff of the hospital and capacity building of the staff with bed capacity >150 within Ahmedabad city. The study was conducted in 100 seated fully equipped lecture halls. A total of 42 (n=42) health care personnel which included 7 doctors,23 nurses, 4 Lab technicians and 8 sanitary staff who were occupied in lecture hall. A questionnaire having 20 questions in form of MCQs as well as fill in the blanks was prepared. All the applicants were asked to answer the paper.

A training session was conducted by Chief Medical Officer with the help of Audio visual aid and poster presentation. This session included the preface and meaning of bio medical waste management ,the quantum of waste generated per bed area wise, the people who are at high risk with improper management of BMW, the standard procedure of segregation with color codes category wise, weighing, labeling, transportation ,treatment and disposal of the same. After training the same questionnaire was given to all the participants and all were asked to fill it up. Pre and post training answer sheets were analyzed to evaluate the impact of training.

Statistical Analysis:

We have selected pair t Test and checked weather any significant difference is occurred between pre and post test scores.

Paired Sample Statistics

	Mean	N	Std. Deviation	Std. Error Mean	C.V
Pre Score	5.79	42	4.003	.618	69.14%
Post Score	13.07	42	2.598	.408	19.87%

Paired Sample Test

	Paired Differences			
	Mean	Std. Deviation	Std. Error Mean	95%Confidence Interval of Difference
Pre & Post Scales	-7.286	3.591	.554	-8.405(LOWER) -6.1679UPPER)

Paired Sample Test

	Value Of T	D.F	Sig(Two Tailed)
Pre & Post Scale	-13.150	41	-000

Conclusion:

If we compare the pre & post test scale with various group there is vast difference between the average value, pre score value and post score value. If we consider standard deviation of both the groups pre test score is more fluctuated then post test score. Even coefficient variation of post test score is also on lower side which shows consistency level of post test score is on higher side the pre test score groups.

The computed t values with n-1 degrees of freedom and 95% confidence level is -13.150 which is less then tabulated values which shows t value is considerable . Hence null hypothesis is rejected and alternative hypothesis is accepted .so it can be concluded that training programmed has considerably improved the knowledge of the employees.

Reference:

1. Praveen Mathur, Sangeeta Patani and Anand S Shobhavat. Need of Biomedical Waste Management System in Hospitals - An Emerging issue   A Review. Current World Environment   Vol. 7(1), 117-124 (2012).
2. Patil ,A. D. Shekdar A.V. 2001, 63
3. BMW (Mgt & hand rules 1998), Ministry of Environment and forest.
4. World Health Organisation: http://www.who.int/injection_safety/toolbox/en/AM_HCW_Safety_EN.pdf

5. World Health Organization (WHO). Safe Management of Bio-Medical Sharps Waste in India: A Report on AlternativeTreatment and Non-Burn Disposal Practices. New Delhi:WHO Regional Office for South-East Asia; 2005.
6. Pandit NB, Mehta HK, Kartha GP, Choudhary SK. Management of bio-medical waste: Awareness and practices in a district of Gujarat. Indian J Public Health. 2005;49:245– . [PubMed]
7. Rao PH. Report: Hospital waste management--awareness and practices: A study of three states in India. Waste Manage Res. 2008;26:297–303. [PubMed]
8. Kishore J, Goel P, Sagar B, Joshi TK. Awareness about biomedical waste management and infection control among dentists of a teaching hospital in New Delhi, India. Indian J Dent Res. 2000;11:157–61.[PubMed]