



BIO-MEDICAL WASTE MANAGEMENT: EFFECT OF EDUCATIONAL INTERVENTION AMONG HEALTH CARE WORKERS IN BANGALORE CITY HOSPITALS

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ABSTRACT

Background: Infectious waste management has always remained a neglected public health problem in the developing countries, resulting in high burden of environmental pollution affecting general masses. This study was conducted to know the effect of intervention on health care personnel's regarding BMW management.

Objectives: To assess the impact of educational intervention on the KAP of HCP's regarding BMW management.

Methodology: An interventional study was conducted among health care Personnel's in Bangalore city hospitals for a period between (January - December 2013) sample size of 550 was initially screened, and 151 were selected for intervention by using a pre-tested structured questionnaire.

Results: This study indicates that the statistical difference between pre-intervention and post-intervention tests ($p < 0.01$) was highly significant. There was 43% increase in knowledge about BMW management.

Conclusion: This study has determined that training programs on the subject of waste management in the health sector has a significant effect in increasing the information level of the healthcare personnel.

Keywords: Biomedical Waste Management, knowledge attitude and practice, health care waste management

INTRODUCTION

The health care services apart from providing curative, promotive and preventive services generates waste, which can be classified into general waste and infectious waste or hazardous waste, which is a threat or has the potential to cause various health hazards which can also lead to contamination of the environment. It is estimated that annually about 0.33 million tonnes of hospital waste is generated in India and, the waste generation rate ranges from 0.5 to 2.0 kg per bed per day.¹ In India uniform guidelines for practice in the country have been laid down under the Bio-medical Management and handling Rules 1998.² The waste management programme in hospitals

are in accordance to these guidelines and aim to minimize cross infection, improve the general hygiene in hospitals and minimize environmental pollution through proper treatment and disposal of waste.³ Persons at risk of exposure include health care facility employees (doctors, nurses, health care assistants, maintenance personnel and support personnel for waste handling, transportation and laundry), patients and their visitors, and waste management facility employees and scavengers. Infectious wastes containing potentially harmful micro-organisms can infect hospital patients, health care employees, and patient's visitors.⁴ Healthcare workers have an important opportunity to manage the environmental effects of

their practices. Their efforts may seem small, but each step builds a base of sound behaviors and thinking that are necessary for the success of the whole.⁵ Moreover, practices that healthcare personnel begin their career with usually become habits that are difficult to change thereafter. This indicates the importance of addressing BMW management issues amongst health care personnel.⁶ There is a considerable paucity of management-strategy related research and context specific explorations of hospital staff perception regarding feasibility and accept-ability of HCWM interventions and implementation strategies, particularly in rural hospital settings.^{7,8,9}

Educational intervention gives an opportunity to figure out ways to serve the problems, the idea is that the behavior gets increasingly intensive to respond to the instructional or behavioral needs, to deliver the solution of the problems educational intervention is one of the best tool in effectiveness and cost effectiveness.

METHODOLOGY

We conducted a follow up study for a period of 1 year (January–December 2013) in the Bangalore city hospitals. The list of hospitals was obtained from sulekha.com (6 month prior to the study). Convenient sample size of 550 was recommended, Based on strata population the city of Bangalore was divided into 4 zones, The hospitals were randomly selected from each zone till the required sample is met from each zone. The HCP's included in the study were the Doctors, Nurses, Housekeeping staff, Laboratory Technicians.

A pilot study was conducted after reviewing previous studies and a Pre-tested, Semi-structured questionnaire was designed (separate for pre and posttest) keeping in mind the objective of the study and the variables. Initially the data was collected by interview method as pre-tested semi-structured questionnaire. The questionnaire had 20 questions to account for knowledge, attitude and practice. The scoring was done into 3 categories 1) No knowledge 2) Inadequate 3) Adequate¹⁰. Category 1 included scores <10, Category 2 included scores <15 and category 3 included scores >15.

The category 1 and 2 were taken for posttest based on the necessity for intervention according to the pilot study undertaken, A single session was conducted with power point presentations on various topics with demonstrations of BMW equipments, procedures and color coded bags, followed by interactive session. The

batches were divided in the frequency of 10-20 depending on the convenience of the staff, each session was 2 hours of scheduled time apart from interactive session and the posttest evaluation was done after a month with a separate questionnaire.

Data were entered and analyzed in statistical software package SPSS version 21. Descriptive statistics were used to describe the distribution of all variables.

RESULTS

In our study we took 550 samples for the pre-test and 151 were taken for post-test.

Table 1: Distribution of study subjects according to age, gender, work experience, training and details of HCP

Characteristics	Frequency (n=550) (%)
Age in years	
≤40	315 (57.27)
>40	235 (42.73)
Gender	
Male	160 (29.1)
Female	390 (70.9)
Work experience in years	
<10 years	223 (40.5)
>10 years	327 (59.5)
Training Received	
Not received	333 (60.5)
Received	217 (39.5)
Details of HCP	
Doctor	165 (30)
Housekeeping staff	115 (20.9)
Lab tech	12 (2.2)
Nurse	258 (46.9)

In this study 57.27% were in the age ≤40 and 42.73% were in >40 age group, 40.5% were having <10 year's experience and 42.73% were having >10 year's experience, 60.5% were not received training and 39.5% were received training. And in this study 30% were doctors, 46.9% were nurses.

Mean of Pre & post intervention of KAP score is 13.99 & 17.61, with t-value (2.748) and there is a significance difference (<0.01) between pre intervention and post intervention of KAP score.

There is a significance difference (<0.01) between pre and post interventions based on work experience of more than 10 years and health personnel's who received training programs. There is a significance difference (<0.01) between pre and post interventions based on age groups and gender group.

Table 2: Pre and post interventions KAP score based on work experience and training program

Characteristics	Pre-interventions KAP score (n=550)	Post-interventions KAP score (n=151)	P-value
Work experience			
<10 years	14.83±4.00 (n=223)	16.95±2.06 (n=43)	<0.01
>10 years	13.42±4.61 (n=327)	17.84±1.57 (n=108)	<0.01
P-value	<0.01	<0.01	
Training received			
Not received	13.46±4.61 (n=333)	17.83±1.56 (n=39)	<0.01
Received	14.80±3.99 (n=217)	16.95±2.09 (n=112)	<0.01
P-value	<0.01	<0.01	

P<0.01 Highly significant; P value calculated by t test

Table 3: Comparison mean of KAP score in pre and post interventions based on age and gender

Characteristics	Pre-interventions KAP score (n=550)	Post-interventions KAP score (n=151)	P-value
Age			
≤30	15.60±2.91 (n=120)	18.45±1.21 (n=23)	<0.01
31-50	13.85±4.15 (n=278)	17.92±1.58 (n=22)	<0.01
>50	11.22±4.67 (n=152)	17.64±1.73 (n=99)	<0.01
P-value	<0.01	<0.01	
Gender			
Male	16.60±2.04 (n=203)	18.95±2.35 (n=38)	<0.01
Female	12.92±4.69 (n=347)	17.61±1.74 (n=113)	<0.01
P-value	<0.01	<0.01	

P<0.01 Highly significant; ; P value calculated by t test

DISCUSSION

Findings of this study revealed that The mean age group of the sample was found to be 41.99 years. The present study revealed that 40.5% of the health care personnel had ≤10 years of experience in their present job. 59.5% had ≥10 years of experience in their respective fields(Shown in table-1). A similar study revealed that 101 (43.91%) had ≤10 years of experience.¹¹ The findings of a similar study revealed that 29 (58%) had experience of 3 years.¹²

Among the subjects of the present study 39.5% of the health care personnel's had training and 70.5 % declared to have had no training whatsoever on medical wastes. When the averages between the pre-intervention test and post-intervention test are examined among the healthcare personnel's who have attended one or more training courses, it will be seen that the averages are raised at the end of training. This situation leads us to think that the tests highlight a deficiency in the information level of the health care personnel that should be replenished with training programs. It may therefore be proposed to draw an effective waste management plan in hospitals, and have that plan continually implemented by training, so as to repair the information deficiency of healthcare personnel's. From the answers to the question "How many times have you attended medical waste training programs?" put to the personnel participating in the study, a significant statistical differ-

ence was found between the attendance status of the subject and the points he/she had scored in the pre-intervention and post-intervention tests (p<0.01). In the study by EL-Sharkawy¹³ significant improvement of good knowledge from 25 to 78% in the internship physicians, was seen after the educational intervention. In the study by El Sayed *etal.*¹⁴ also, a statistically significant improvement in the nurses' knowledge and practices about healthcare waste management, was seen after introduction of the intervention program. The results of the present study too are consistent with the conclusions of a multiple number of research study delving into the information level on medical waste of health workers^{15,16,17,18} waste.

This study provides an insight into what the hospital staff perceives about HCP and their current practices, how do they act and react, what are their training and other needs, what is immediately possible and acceptable and what is not. The study found evidence of a gap between theoretical thinking and actual practice. Awareness and preparedness were satisfactory whereas clarity, updating, involvement, emphasis, basic provisions and overall management appeared lacking. As the study explores perception of hospital staff about the HCP process right from generation of HC waste to its removal from the hospital, the generated information will be helpful in developing ap-

appropriate management strategies for improving HCP in many similar settings.

The findings of the present study further indicate a need to improve involvement, knowledge, skills and capabilities of the hospital staff making it a part of organizational-culture-change. For this a multipronged strategy is needed with an emphasis on providing better facilities and training. Several interventions, for example posters, reminders and role-models, which had been suggested for improving hand hygiene, were also suggested for waste management.¹⁹

CONCLUSIONS

To conclude this study the HCP's were lacking the proper scientific KAP of the biomedical waste management which showed a significant improvement after single training programme. Repeated training at regular interval will only enhance the efficiency.

RECOMMENDATIONS

A very strict implementation of biomedical waste management rules is the need of the hour. It should be made mandatory for healthcare facilities to get their healthcare personnel trained from accredited training centers. These training sessions should not become merely a one-time activity but should be a continuous process depending upon the patient input in different healthcare facilities.

Study limitation

The study was limited to few hospital only. The sample size might not be the exact representatives of the whole case so as to generalize the findings of the study.

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