Research Article

# Improvement of clinical waste management in Selected Medical Officer of Health Areas under Regional Director of Health Services Galle.

*Alahapperuma D[1], Suraweera I[2]*

[1] Senior Registrar in Medical Administration, [2] Consultant community Physician

## Abstract

**Introduction** Clinical waste management is a worldwide burning issue. Environmental pollution and associated health risks including disease transmission and social issues are the main impact of this problem. Government pays more attention for clinical waste management in the curative sector than preventive sector. Proper waste management practices are needed to be improved in the preventive sector in Sri Lanka as well. This intervention project was carried out in selected Medical officer of Health (MOH) offices in Galle Regional Director of Health (RDHS) division.

**Objective** To improve the clinical waste management in clinics conducted in selected MOH offices in Galle district.

**Methods** Initial assessments were done to identify the waste generation and segregation practices in the clinics in MOH offices. Staff knowledge and practices on waste management and available facilities for segregation were assessed and an intervention was developed and implemented. The post intervention analysis was done to evaluate the effectiveness of the intervention.

**Results & Conclusion** The main problems identified were lack of facilities, poor knowledge in Clinical Waste Management and low priority of top management for proper clinical waste management. New information, educational and communication material were developed to improve the knowledge on the color coding, segregation, temporary storage, transport and final disposal. Several awareness sessions were conducted for public heath midwives( PHM). Improvement of knowledge and practices after intervention was statistically significant (P=000).

Key words: Clinical Waste management, Segregation, Incinerator

## Introduction

### Background

Clinical waste is defined as any waste resulting from medical, nursing, dental, pharmaceutical, skin penetration or other related clinical activity that has the potential to cause injury, infection or offence[1]. Clinical waste management includes all the events and activities required to manage from generation to final disposal[2]. This consists of collection, transport, treatment, temporary storage, and disposal together with monitoring, evaluation and regulation. It also involves the legal and regulatory framework.

Medical Officer of Health (MOH) office is the main grass root level health services provider to the people in Sri Lanka. Maternal and child care, preventive health care, immunization and family planning are the key programs

conducted by MOH offices[3]. Vaccination, insertion of family planning objects, blood drawing, wound dressing and various screening procedures are conducted at MOH offices. Clinical waste (CW) is generated in the clinics such as syringes, needles, scalpel blades, utility gloves, cotton and pathological substances[4].

### Justification

Substandard way of clinical Waste management practices noticed in MOH offices in everywhere. Physical injuries, environmental contamination, breeding ground for vectors and cross or auto infection to people are main health hazard encounter in CWM. Unorganized clinical waste management practice in MOH office also lead to unpleasant environment to the customers and the staff. There are complaints against MOH staff members regarding disposal and transport of clinical waste in destructive and unpleasant manner. It is also related to knowledge and skills of infection control.

## Objectives

### General Objective

To improve the clinical waste management in all clinics conducted in selected Medical Officers Health (MOH) areas in Reginal Director of Health Services (RDHS) Galle.

### Specific Objectives

1. To assess the current clinical waste management process in selected clinics conducted in selected MOH areas in RDHS Galle.
2. To improve clinical waste management process in selected clinics conducted in selected MOH area in RDHS Galle.
3. To assess the effectiveness of new clinical waste management interventions

## Literature Review

### Clinical Waste

Clinical waste is potentially dangerous because it can cause cuts and needle-stick injuries or transmit disease. If improperly handled, clinical waste would be hazardous to people at the workplace, cleaners, waste handlers, and the general public[5].

### Clinical Waste Management

When handling and disposing of CW is increased health hazards and environmental pollution. lack of specialized clinical staffs, lack of awareness, the lack of appropriate legislation and effective control are main reasons in mismanagement of CW. Most of the healthcare facilities of the developing world have encountered financial difficulties and looking for cost effective disposal methods of CW[6].

CWM is very important due to its infectious and hazardous nature irrespective of amount generated that can cause uninvited effects on humans and the environment. Clinical waste is an unavoidable by product of health care services, managing the waste generated is considered a prime responsibility of health care institutions[7]. Clinical waste is not properly managed, it gives excessive health and environmental problems like water, air and soil pollution, and adds additional problem to the health care cost and to the economy[8]. Study in National Hospital in Sri Lanka, Occupational safety measures taken during handling waste were not satisfactory. Internal transport and internal storage of waste were not safe. Trolleys were inspected and found not cleaned properly[9].

Waste segregation as 'separating different types of waste based on the type of treatment and disposal practices'[7]. They also point out that treatment and disposal costs can be significantly reduced by preventing mixing of non-hazardous waste with hazardous waste[7]. Lack of segregation is the root cause of many problems in clinical waste management in many countries[10].

Clinical waste management depends on a dedicated waste management team supported by administration with careful planning, available legislation, monitoring and supervision with adequate financing and full participation of the staff[7]. India is a good example for what can be achieved in hospitals. By changing staff attitudes and incorporate waste management practices in to daily operations[11].

Lack of awareness on hazards of health-care waste, inadequate training in proper waste management, absence of waste management and disposal systems, insufficient financial and human resources and the low priority given to the topic are the most common problems encounter in health-care waste management[7].

**Table 1: Age distribution of PHM in selected MOH areas**

| Age (years) | Frequency | Percent |
|---|---|---|
| 20-29 | 22 | 18.3 |
| 30-39 | 47 | 39.2 |
| 40-49 | 37 | 30.8 |
| 50 and above | 14 | 11.7 |
| **Service experience** | | |
| 1-10 years | 46 | 38.3 |
| More than 10 years | 74 | 61.7 |

## Methods

This study was conducted in all PHMs of selected MOH areas in RDHS Galle. Study period was from 01 April 2019 to 25 June 2019. Data collection were accomplished in 3 phases.

**Pre-Intervention**

Assessed the current practices of clinical waste management among all PHMs in selected MOH offices in RDHS Galle. A self-administered questionnaire was used to assess the current knowledge, practices and awareness of clinical waste management. A Focus Group Discussion (FGD) and a Key Informant Interview (KII) were conducted to identify issues in clinical waste management.

Guidelines were developed to MOH

a) Training and awareness programmes were conducted to staff.
b) Checklist was developed to monitor the CWM
c) Supervisor was appointed to monitor CWM in MOH area
d) New posters were printed and distributed in every clinic
e) Adequate waste bins and bags were distributed to MOH for storage.
f) Implemented CW transport and final disposal at BH Elpitiya.

**Post Intervention Assessment**

- No of clinic adhere to National Guide Line.
- Focus group discussion.
- Questionnaires.

## Results

Majority (70%) of sample was between 30 to 49 years and more than 61.7% had experience in health sector more than 10 years.

Table 1 describes PHMs background information on selected CWM fields.

Majority of PHM are 40 – 49 age group. More than 50 years old PHMs are only less than 12 presents. When it comes to service experience most of them have more than 10 years work experiences.

It was revealed that only 20.8 % PHMs were vaccinated against Hepatitis B.

When it comes to training on waste management was satisfactory and it was 59.2 %. In the other hand training on 5 S, infection control and training on waste management circulars not up to the desirable level and it was 44.2 %, 13.3 % and 11.7 consecutively.

**Table 2: Distribution of the PHMs according to vaccination status and training experience in selected MOH areas**

| Item | Frequency | Percent |
|---|---|---|
| **Hepatitis B Vaccinated** | | |
| Yes | 25 | 20.8 |
| No | 95 | 79.2 |
| **Training on Waste Management** | | |
| Yes | 71 | 59.2 |
| No | 49 | 40.8 |
| **Training on 5S** | | |
| Yes | 53 | 44.2 |
| No | 67 | 55.8 |
| **Training on Infection Control** | | |
| Yes | 16 | 13.3 |
| No | 104 | 86.7 |
| **Training on Waste Management Circulars** | | |
| Yes | 14 | 11.7 |
| No | 106 | 88.3 |

**Table 3: Level of knowledge and practice of the CWM of PHMs in selected MOH areas**
*NB: Total Sample size = 120*

| | Mean score | | Statistics Wilcoxon Signed Ranks Test |
|---|---|---|---|
| | Pre | Post | |
| **Knowledge** | | | |
| Segregation | 1.4 | 7.11 | P=.001 |
| Transport | 2.33 | 3.64 | P=.001 |
| Final disposal | 8.46 | 12.95 | P=.001 |
| Disease Transmission | 19.2 | 20.94 | P=.001 |
| Temporary storage | 6.63 | 11.73 | P=.001 |
| **Practice** | 8.04 | 11.53 | P=.001 |

After intervention, knowledge improvement was assessed using self-administrative questioner. It was improved significantly at 1% significant level.

Clinical waste management practice was assessed by observation check list. It also improved significantly at a rate of 1%.

## Discussion

Substandard Clinical waste management practices in preventive health sector is burning issue. There was low attention has been given to improve the CWM in preventive sector in Sri Lanka. This intervention project was aimed to improve clinical waste management in maternal and child health field (MCH) clinics conducted in selected MOH areas in in Galle RDHS.

Unavailability of adequate number of utensils, improper waste labels, Personal Protective Equipment and poor guidance and encouragements from administrators were identified as important barriers for proper segregation. This resulted in mixing of paper, polythene, foods left over and some clinical waste. Many field clinics did not have waste bins for collecting general waste. Thus, people were influenced to dispose even general waste to available bins. There were no adequate colour coded bins for all waste categories. But clinical waste and vaccine vials were disposed to safety box. There were instances of using yellow bags other than non-clinical waste bins due to non-availability of black bags.

"SIGN BOARDS" have not been displayed for waste segregation. Less attention has been paid by the majority of the staff for waste management and it has not been considered as one of the responsibility. Thus, several awareness programs were arranged to improve the knowledge and practice of PHM on CWM.

Many clinics didn't have proper place for temporary storage and no proper plan for general waste management. Collected polythene and paper had been disposed as general waste with food waste. Final disposal was open burning of all waste including clinical waste, polyethene and plastic. This caused environment pollution (water, air, soil) and negative health impact for the surrounding people (infection, dioxin inhalation).

The internal guide line for CWM was prepared and introduce to MOH office. This was included colour coding of segregation, usage of personal protective equipment and protection from injuries. Supervisory checklist was prepared and establish in the clinics, Supervisory team was appointed for monitoring of sustainability of project.

Regional Director Health Service Gall arranged final disposal of CW in these MOHs directed to incinerator in BH Elpitiya. Continuous awareness programme covering all categories of staff was done throughout the project.

Remarkable changes in segregation of waste material were observed following several awareness program and continuous supervision carried out by the supervisory staff in addition to introduction of new posters and labels on color code with pictorial masseges. Knowledge and practice significantly improved post-intervention. Mean Knowledge on segregation has improved from 1.4 to 7.11 ($p=.001$). On the other hand, mean knowledge on final disposal also improved from 8.46 to 12.95 ($p=.001$).

After the intervention the mean practices on CWM has improved from 8.04 to 11.53. Which was also statistically significant at 1% level (Table 4.3). The periodical supervision by the supervisory team was one of the main factors for the success of the project. Sharing of supervision findings and good practices among all the staff members of the MOH office lead to motivate them for better practices.

## Conclusions and Recommendations

### Conclusions

The staff knowledge on colour code was unsatisfactory at the beginning of the project. The existing labels and posters did not help for proper segregation of waste materials. Unavailability of adequate dustbins was some of the issues raised by the staff with regard to waste management. Project evaluation has shown that there was a significant improvement in waste segregation and disposal.

### Recommendations

1. To incorporate regular waste management training and health education programmes to all stakeholders.
2. To provide adequate facilities for proper waste segregation, and transport facilities.

3. To make regular supervision on waste management, sharing experience and good practices need for better staff compliance.
4. To establish an active waste management committee in district and central level to develop and monitor the preventive sector waste management plan.
5. To motivate the staff by conducting competitions among clinic.

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