

Management of Sharps Waste in Manila Hospitals (Part 2) Awareness of Hospital Employees on the Principles of Healthcare Waste Management in Six Tertiary Bay Area Hospitals in South Manila, Philippines

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ABSTRACT

Objective. This paper evaluated the personnel of three public and three private hospitals in the Metro Manila area in terms of their knowledge of the (1) Hospital Waste Committee at their hospital and (2) the general guidelines of segregation and handling of hospital wastes.

Methods. Convenience sampling was used. Nurses, medical technologists, and janitorial staff present at three private and three public tertiary hospitals in south Manila during respective data collection visits were given a self-administered questionnaire.

Results. The majority of those included in the study had correct knowledge regarding the Waste Management Committee of their particular hospital but did not have enough knowledge regarding general waste management, particularly sharps waste management. The medical technologists and nurses in both private and public hospitals had about the same knowledge and awareness regarding hospital policies and sharps waste management; however, there were differences between the knowledge and awareness of private and government hospital janitorial staff. Two of the perceived problems in waste management of the hospitals were (1) the general lack of knowledge regarding waste management, specifically sharps waste and (2) the lack of hospital support in terms of provision of proper waste disposals.

Conclusion. Workers involved in sharps waste management in tertiary hospitals had enough knowledge regarding the Waste Management Committee, but the respondents did not have enough knowledge regarding waste management in general and sharps waste management in particular. Problems perceived by respondents are: lack of knowledge regarding waste management and lack of hospital support.

Key Words: *hospital, hospitals wastes, sharps wastes, infectious wastes, hazardous wastes, hospital waste management*

Introduction

It is ironic that healthcare institutions established to heal the sick and alleviate pain also produce potential sources of diseases. These sources of disease are the hazardous wastes which are the products of the usual daily activities of the biggest healthcare institutions, i.e., the hospitals. Being producers of these hazardous kinds of waste, these institutions have the responsibility of making their environment safe for patients, employees, and visitors.

Poorly managed healthcare waste exposes health workers, patients, waste handlers, and the community to infectious diseases. Contaminated needles and syringes represent a particular threat. The WHO estimated that 10 to 20 nurses and housekeeping personnel out of 1,000 workers are at risk for injuries while 180 per 1,000 healthcare waste handlers will have occupational injuries.¹

As part of a series of three articles describing the management of hazardous wastes in six tertiary hospitals in the Manila Bay area,* this second article presents the knowledge of hospital employees regarding healthcare waste management, specifically sharps waste and their handling, transport, and storage. This knowledge will hopefully translate into policies that will make the hospital environment safe and accident-free.

Methods

The bay area hospitals are a discrete set of hospitals in the Manila Bay area located in the south of Manila. This location is home to seven tertiary hospitals including four private and three public hospitals. One private and one public hospital refused participation in the study. One public hospital was taken at random from those very near the Manila Bay to equalize the sample into three public and three private hospitals. The heads of these hospitals were assured anonymity and confidentiality of study results. Tertiary hospitals are operationally defined as hospitals offering subspecialty medical services.

Of the three private hospitals, one was nonsectarian and the other two were run by religious organizations. Two of

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*See Acta Medica Philippina Volume 44 Number 1 for Management of "SHARPS" Wastes in Manila Hospitals (Part 1).

the public tertiary hospitals were run by the national government while the third was under the local government.

Of all the employees of hospitals in the Philippines, nurses, medical technologists and janitorial staff were chosen to answer the questionnaires given. They were deemed the ones directly and constantly involved in the production, storage, and transport of hazardous wastes. The nurses were chosen because they prepare medication for intravenous and intramuscular injections; medical technologists include phlebotomists who constantly handle blood-laden gauze and sharps waste; and janitorial staff transport and store waste.

Convenience sampling was used in this study. Those present during the data collection visit were given questionnaires. Approximately fifteen persons in every occupational level per hospital participated in the study.

Tool Development

A questionnaire was formulated based on both local and international data regarding hazardous wastes, their production, segregation, and disposal. This included rules and regulations regarding hazardous waste management as recommended by the World Health Organization¹ and as dictated by Philippine government agencies, specifically the Department of Health (DOH),²⁻⁶ the Department of Environment and Natural Resources (DENR),^{7,8,9,10} and the DOH-DENR¹¹ implementing rules and regulations for safe waste management in the hospitals.

The survey questionnaire, printed in the Filipino vernacular and understood by all the respondents, was divided into five parts. Part 1 described the demographic profile of the respondents, including age, gender, civil status, and length of service on the hospital staff. Parts 2 and 3 were multiple choice questions while Parts 4 and 5 were open-ended questions. Part 2, from items one to four, required the respondents to answer their awareness of the Hospital's Waste Management Committee. Part 3, from items six to 18, tested the respondents on their knowledge of the proper ways of disposing sharps waste in a hospital. Part 4 was question 19, which asked the respondents the problems they perceived, if any, in sharps waste disposal at their hospital. Part 5, the last question, asked respondents to list down their recommendations, if any, to help solve the problems in the hospital regarding sharps waste management. The questionnaire itself was not presented as divided into these parts to preserve the fluidity of the respondents' thoughts.

Three questions were of greatest practical importance to the study: (1) What topics were the respondents failing? There has been no previous study of this kind upon review of literature. An item analysis was done and it was established that 75% of the respondents in each hospital in each work group should be able to answer each item correctly. The topics in which less than 75% of the

respondents gave correct answers should be the focus of health promotion interventions and policies in order to achieve an acceptable level of awareness. (2) Which kind of hospital (public or private) failed to achieve a 75% rate in the survey? Again, because of lack of precedence, a passing rate of 75% (or 13 out of 18 multiple choice questions) was set. The average grade of the three work groups in the private hospitals and the average grade of the three work groups in the public hospitals were taken. The kind of hospital in which the respondents scored less than 75% will be the focus of future health promotion interventions (training and workshops) regarding sharps waste management. (3) Which profession (janitor, medical technologist, nurse) failed to achieve 75% awareness of the principles of hospital sharps waste disposal? It is wise to know which profession has members who still lack knowledge in these procedures. Those who had low scores should repeatedly undergo these interventions.

Results

Description of Respondents

The respondents were divided into three groups (Table 1) based on occupation: the nurses, medical technologists, and the janitorial staff. The nurses comprised 43.4% (66) of the respondents in the private hospitals while they comprised 42.3% (58) of the respondents in the government hospitals. The medical technologists were the smallest group of respondents in both private (18.4%) and government (27.7%) hospitals. The janitorial staff comprised 38.2% and 29.9% of the respondents in the private and the government hospitals, respectively.

Table 1. Distribution of Respondent's Occupational Level by Type of Hospital

| Occupation | Private Hospitals | Public Hospitals | Total |
|----------------------|-------------------|------------------|-------------|
| | n (%) | n (%) | n (%) |
| Nurse | 66 (43.4) | 58 (42.3) | 124 (42.9) |
| Medical Technologist | 28 (18.4) | 38 (27.7) | 66 (27.7) |
| Janitor | 58 (38.2) | 41 (29.9) | 99 (34.3) |
| Total | 152 (100.0) | 137 (100.0) | 289 (100.0) |

There were more female than male respondents in both hospitals (Table 2). The respondents in the private hospitals were 53.9% female while the respondents in the government hospitals were 59.8% female. In the private hospitals, 15.1% of the data was missing. Specifically, respondents did not indicate gender.

The mean age of the respondents in the private hospitals was 29.9 years (range 18 to 56 years, Table 3). The mean age of the respondents in the government hospitals was 34.2 years (range 18 to 61 years).

Table 2. Distribution of Respondent’s Gender by Type of Hospital

| Sex | Private Hospitals n (%) | Public Hospitals n (%) | Total n (%) |
|---------|----------------------------|---------------------------|----------------|
| Female | 82 (53.9) | 82 (59.8) | 164 (56.7) |
| Male | 47 (30.9) | 50 (36.5) | 97 (33.6) |
| Missing | 23 (15.1) | 5 (3.6) | 28 (9.7) |
| Total | 152 (100.0) | 137 (100.0) | 289 (100.0) |

Table 3. Descriptive Statistics: Respondent’s Age by Type of Hospital

| Age | Private Hospitals | Public Hospitals | Total |
|---------|-------------------|------------------|-------|
| Obs | 124 | 123 | 247 |
| Mean | 29.9 | 34.2 | 32.0 |
| SD | 7.6 | 10.1 | 9.2 |
| Min,Max | 18,56 | 18,61 | 18,61 |

Answers to the Survey Tool

The level of awareness of the respondents in both private and public tertiary hospitals was almost perfect when it came to the awareness of the existence of a Waste Management Committee in their respective hospitals.

Out of the 16 remaining questions, there were 6 items in which less than 75% of the respondents answered correctly. These items were Item 6, the different routes of entry of bacteria into the body from hazardous wastes; Item 7, reasons why sharps waste is hazardous; Item 8, who are the persons at risk of contracting diseases from sharps hospital waste; Item 12, waste segregation color-coding; Item 17, the fact that not all garbage collectors can collect hospital hazardous wastes; and Item 18, the frequency at which hospital waste should be collected.

On average, when the survey is taken as a whole, private and government hospital employees did not differ in the level of their awareness of hospital policies, policy makers, and hospital sharps waste management. In fact, the mean scores of the respondents in the private and government hospitals are exactly the same: 13 out of 17 items (Table 4).

Based on informal interviews with the hospital administrators, it was assumed that the employees of these hospitals would be knowledgeable about the Waste Management Committees of their respective hospitals and about medical waste management in general. However, when the scores were gathered, the scores were in the 70th percentile. If we consider the 75th percentile score as the

passing score, respondents should be able to provide 13 correct answers. Table 5 shows that only the janitorial staff of the government hospitals failed in this survey. Furthermore, no work group achieved a score of greater than 80% (13.6 correct answers).

Table 4. Descriptive Statistics: Mean Scores Showing the Extent of Awareness of Respondents from the Survey by Type of Hospital

| Total Scores | Private | Public | Total |
|--------------|---------|--------|-------|
| Mean | 13.1 | 13.1 | 13.1 |
| SD | 1.6 | 2.1 | 1.8 |
| Min,Max | 7,16 | 9,17 | 7,17 |

The results demonstrate that the medical technologists and nurses in both the private and public hospitals had about the same knowledge regarding hospital policies and sharps waste management. There is, however, a slight difference in the level of knowledge and awareness regarding sharps waste management between private and government janitorial staff.

The majority of respondents ($f = 60$) believed that lack of knowledge was a significant problem in terms of hospital waste management. Lack of supplies provided by the hospitals due to budgetary constraints was another problem. The respondents said that their hospitals did not have adequate supplies of properly color-coded garbage receptacles and signage. A third problem perceived by the respondents was lack of discipline with regard to waste disposal.

The respondents recommended that frequent seminars (a health promotion strategy) to provide hospital personnel and patients knowledge regarding hospital waste management be conducted. They also recommended the provision of resources, including manpower and utilities. In terms of manpower, the respondents indicated a lack of garbage collectors within the hospital and housekeeping staff. In terms of utilities, the respondents said their hospitals needed more properly color-coded garbage receptacles. Instilling discipline was the third overall recommendation made by both the private and government hospital respondents. The respondents suggested establishing penalties ($f = 8$) for not abiding with the hospital rules and regulations regarding waste management.

Table 5. Descriptive Statistics: Mean Scores Showing the Extent of Awareness of Respondents by Occupation by Type of Hospital

| Total Scores | Nurse | | Medical Technologist | | Janitor | | Total |
|--------------|---------|--------|----------------------|--------|---------|--------|-------|
| | Private | Public | Private | Public | Private | Public | |
| Mean | 13.1 | 13.6 | 13.4 | 13.6 | 12.9 | 11.9 | 13.1 |
| SD | 1.9 | 1.9 | 1.5 | 2.1 | 1.1 | 1.8 | 1.8 |
| Min,Max | 7,16 | 10,17 | 9,16 | 10,17 | 11,15 | 9,15 | 7,17 |

Discussion

The majority of the workers involved in sharps waste management in tertiary hospitals located in and around the Manila Bay area had correct knowledge regarding the Waste Management Committees of their respective hospitals. However, the respondents did not have enough knowledge regarding waste management in general and sharps waste management in particular. The particular topics which they uniformly failed in were the route of entry of bacteria into the body from hazardous wastes, reasons why sharps waste is hazardous, persons at risk of contracting diseases from sharps hospital waste, waste segregation color-coding, the fact that not all garbage collectors can collect hospital waste, and the frequency at which hospital waste should be collected.

It has been shown that the medical technologists and nurses in both private and public hospitals had about the same awareness regarding hospital policies and sharps waste management. There were, however, differences in the level of awareness on sharps waste management between private and government janitorial staff.

The mean scores of all the employees of the private and government hospitals in this study were above 75%. However, taken by work group, the mean scores of the janitorial staff from both public and private hospitals were below 75%, while both nurses and medical technologists scored 75% or higher.

The problems perceived by the respondents are lack of knowledge regarding waste management, specifically sharps waste management, and lack of hospital support in terms of provision of proper waste disposal utilities, specifically properly color-coded garbage receptacles and sharps waste containers.

The respondents recommended holding regular seminars to improve awareness and keep employees and patients updated regarding waste management. They also recommended the provision of resources including more properly color-coded garbage receptacles and manpower.

Recommendations

It is recommended that the Waste Management Committees of all tertiary hospitals should conduct health promotion interventions such as seminars as regular employee orientation sessions. Considering the regularity of turnover for healthcare staff, these seminars should be attended by all new employees of the hospital and every year thereafter (regular turnover rate of nurses in the Philippines). This is based on the fact respondents have inadequate knowledge and awareness. As part of the Needs Assessment before conducting any intervention and as part of good health promotion and education practices, items identified by questionnaire should be emphasized in training programs.

As a follow through of the seminars, policies should be established to ensure that knowledge is translated into practice. A form of validation is through an observation checklist in which the hospital premises are constantly monitored for implementation of relevant rules and regulations. For instance, storage receptacles for sharps waste should be checked for puncture-proofing and proper labeling.

Furthermore, all hospitals should be provided with Information/Education/Communication (IEC) materials that can be posted at nurses' stations and in laboratories.

Further studies on other types of hazardous waste should be conducted to establish a holistic approach to the hospital waste management system.

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