HEALTH CARE WASTE MANAGEMENT PRACTICES IN THE HOSPİTALS OF TABUK CITY

Christina L. Ammakiw, RN, RM, MAN, MSN
Judith S.Balicag , RN,MSN
Marymina P. Odiem, PhD

Abstract

The study determined the frequency of practice of the health care waste management practices on segregation, minimization, collection, storage, transport, disposal and treatment in the hospitals in Tabuk City.

The study utilized a descriptive cross-sectional design. Interviews and ocular surveys/on-site observation, and the interviewer-administered questionnaire were utilized to gather data from the head nurse, waste handler during collection, waste handler during transport and waste manager.

Data collected were treated using a five point Likert scale, and quantified using the frequency count, ranking, percentage and the Weighted Mean.

The revealed that the health care wastes management practices are sometimes implemented in the hospitals in Tabuk City; segregation of wastes was generally often practiced, however, the use of plastic bags/plastic-lined cardboard boxes/leak-proof as containers of infectious and pathological wastes was seldom practiced. Waste minimization was often practiced, but composting was seldom practiced. Waste collection was sometimes practiced, but the collection of general wastes every shift and collection of biohazard wastes every shift was seldom practiced by the respondents.

Waste storage and waste transport were sometimes practiced by the hospitals; but labeling properly all bags/containers with basic information of content, written or attached on the bag, and using transport vehicles exclusively for HCW were never practiced.

Waste disposal was sometimes practiced, but offsite disposal exclusively for HCW was never practiced. Waste treatment was seldom practiced. Treating HCW before disposal, onsite treatment and using chemical disinfection as a type of treatment were seldom practiced while categorizing HCW when treating and treating wastewater prior to discharge off-site" were never practiced.

From the conclusive results, the following recommendations were formulated: There is a need for the DOH to monitor regularly the management of health care wastes in each hospital

1. For waste segregation, in the use of labels and color coding scheme, all body fluids and excreta should be disposed in the infectious category.
2. Waste minimization through source reduction and recycling not only of plastics but also other recyclable materials such as papers
3. Strengthen the practice of composting
4. Due to the lack of appropriate storage area, collection and transport of biohazard waste should be done daily.
5. The city government should propose a separate disposal site for all healthcare wastes and set limit to public access to decrease the risk of infectious diseases
6. Burial pits should be lined with material of low permeability, such as clay, to prevent groundwater contamination. However, burial pits are recommended if they are located within

the premises of the establishment. Encapsulation is the best method for disposal of sharps and should be practiced.

7. Waste treatment should be done to all infectious wastes.

8. The KASC Midwifery Department can initiate and conduct education and information campaign (IEC) for the hospital personnel, patients and guests at least once a year

Keywords: Helath care, hospitals, Tabuk city

Introduction

There are five hospitals in Tabuk city that include Kalinga Provincial Hospital, Almora General Hospital, Holy Trinity Hospital, St. Peter Claver hospital, and St. Jude Hospital. All these hospitals are licensed under Department of Health which is the fundamental criteria for the selection of hospitals for inclusion in this study. Kalinga Provincial hospital is a government hospital, classified as secondary hospital and largest in Tabuk city and the whole province of Kalinga. It operates with a 100-bed capacity and has four departments to include Surgery, Pediatrics, OB-Gyne and Medicine with basic services on radiology, X-ray, anesthesia and laboratory. The Kalinga Provincial Hospital is also the core referral hospital in the province of Kalinga. At present, facilities and services of the Kalinga Provincial Hospital are being upgraded as part of the Provincial Government's program to provide quality health services to the people. The Kalinga Provincial Hospital is governed by the board of Governors and headed by the Secretary of Health as provided by PD 1411. The daily operation is undertaken by Dr. Romulo Gaerlan, the provincial Health Officer.

Almora General Hospital is a private institution owned by Dr. Jaime Almora located at Purok 04, Bulanao. It is classified as secondary hospital and operates with a 15-bed capacity. It has four departments to include Surgery, Pediatrics, OB-Gyne and Medicine with basic services on radiology, X-ray, anesthesia, laboratory, laparoscopy and bone densitometry. The owner is a practicing surgeon and also the medical director of the Almora General Hospital (AGH).

Holy Trinity Medical Clinic is located at Purok 06, Bulanao, Tabuk, Kalinga. It is classified as primary hospital and operates with 10-bed capacity. The owner is Dr. George Taclobao, medicine doctor, and is also the medical director of the hospital.

St. Peter Claver Hospital is formerly St. Luke's Emergency Hospital which is located at Poblacion, Tabuk City, Kalinga. It is classified as primary hospital and operates with 22-bed capacity. The current hospital administrator and owner is Jane A. Claver, a nurse by profession. St. Jude Hospital is found at Mabini St., Poblacion, Tabuk, Kalinga. It is classified as primary hospital and operates with 20-bed capacity. The present medical director is Dr. Clifford John R. Gacuya who is the owner of the hospital.

Conceptual framework

Waste management practices of hospitals today on environmental configurations are anchored on the concept on Environmental theory of Florence Nightingale.

Nightingale stated in her nursing notes that nursing "is an act of utilizing the environment of the patient to assist him in his recovery" (Nightingale 1860/1969), that it involves the nurse's initiative to configure environmental settings appropriate for the gradual restoration of the patient's health, and that external factors associated with the patient's surroundings affect life or biologic and physiologic processes, and his development.

The above idea goes along with the same path to the study since the study aims to determine the waste management practices of hospitals. The suggested waste management

practices of the Department of Health are forms of environmental configurations that would not only restore patient's health but the public at large.

Nightingale also believed that pure fresh air, pure water, effective drainage, cleanliness and light are the environmental factors affecting health that any deficiency in one or more of these factors could lead to impaired functioning of life processes or diminished health status.

Hence, this study intended to determine the frequency of practice of segregation, minimization, waste treatment, proper storage and proper waste disposal in the hospitals covered guided with the concepts that segregation and minimization of wastes in the forms of recycling and reusing would help in maintaining cleanliness of the environment because wastes are lessened. Waste treatment leads to pure water. Proper storage and proper waste disposal also leads to cleanliness, pure air, pure water and effective drainage.

Significance of the Study

This study was conducted to provide data on the health care waste management of the abovementioned hospitals. The results will help provide the framework for policy formulation and promote regulatory compliance on the health care waste management guidelines of the Department of Health. Through this study, it is hoped that there will be (1) protection of the health of waste generators, waste handlers, clients, and the entire community; (2) protection of the environment from the potential hazards; (3) economic benefits resulting from reuse and recycle of waste; (4) opportunities for private sectors to provide waste treatments and final disposal sites for HCW; and (5) healthier and safer environment.

Objectives

General objective: The study aimed to determine the health care waste management practices of hospitals in Tabuk city.

Specific objective: To determine the frequency of practice of the health care waste management practices on segregation, minimization, collection, storage, transport, disposal and treatment in the hospitals in Tabuk City.

Procedure/Methodology

The respondents were the personnel from the hospitals licensed by the Department of Health particularly waste manager, head nurse, and the waste handlers during collection and transport. The Head nurse supervises nursing staff and nursing aids who are most responsible in segregating waste, the waste handler (collection and storage) is the janitor/ institutional worker responsible in the collection, storage, and treatment (if any) of healthcare waste within the hospitals, the Waste handler for transport and disposal site is the Janitor/ city garbage truck driver/ utility person in disposal site who is responsible in the transportation of HCW and off-site treatment and final disposal, and the Waste manager refers to the hospital administrator knowledgeable of the waste treatment plan of the hospital.

Final Procedure

The study utilized a descriptive cross-sectional design. Through interviews and ocular surveys/on-site observation, and the interviewer-administered questionnaire for the head nurse, waste handler during collection, waste handler during transport and waste manager. The questionnaire was constructed patterned from the study "Waste management practices of Free-standing clinical laboratories in Zamboanga city" (Alfaro, 2009).

Data collected were quantified for description using a five point likert scale with the indicated limits and corresponding descriptive equivalent.

Scale	Limits	Descriptive Equivalent
5	4.21 – 5.0	Always (A)
4	3.41_ 4.20	Often (O)
3	2.61_ 3.40	Sometimes(S)
2	1.81 _ 2.60	Seldom (Se)
1	1.0 – 1.80	Never (N)

Frequency count, ranking, percentage and the Weighted Mean were used to quantify data for description.

Resultas and discussions

Frequency of Health Care Waste Management Practices of Hospitals in Tabuk city

The findings on health care waste management practices are presented along waste segregation, waste minimization, waste collection, waste storage, waste transport, waste disposal and waste treatment.

Waste Segregation

Table 1 shows the frequency of practice of the management practices on waste segregation.

Table 1. Frequency of Practices on Waste Segregation in Tabuk City

Waste Segregation Practices	**WM**	**Interpretation**
1. Waste is segregated at point of generation (by staff)	4.0	Often
2. Use of color-coding scheme for HCW segregation	2.40	Seldom
3. Waste containers are labeled	3.6	Often
4. Waste containers are stored away from drains	5.0	Always
5. General waste containers are placed beside infectious waste containers	4.0	Often
6. Sharps are collected together whether or not they are contaminated	5.0	Always
7. Sharps containers are puncture-proof (metal/ high-density plastic)	2.6	Seldom
8. Containers of infectious and pathological wastes are placed in plastic bags/plastic-lined cardboard boxes/leak-proof	1.4	Not Practiced
9. Appropriate containers or bag holder are placed in all locations where particular categories of waste maybe generated	2.60	Seldom
10. Body fluids(blood, serum, sputum, urine, discharges, etc) are disposed down the drain	5.0	Always
11. Chemicals are disposed down the drain	4.30	Always
Total Mean	3.63	Often

As shown by the table, the waste management practices on segregation were generally often practiced as revealed by the Total Mean of 3.63

The researchers identified 11 practices on segregation of which 3 of these were always practiced as revealed by the obtained Mean of 5.0 each. These were the indicators of waste containers are stored away from drains, and body fluids(blood, serum, sputum, urine, discharges, etc) are disposed down the drain. Similarly, the practice that chemicals are disposed down the drain was always practiced with an obtained mean of 4.30.

The practice that general waste containers are placed beside infectious waste containers was often practiced with a Mean of 4.4 together with the practice of “waste containers are labeled” as evidenced by the Mean of 3.6.

The practice of using color-coding scheme for HCW segregation was seldom practiced as shown by the obtained Mean of 2.40 together with the practice that sharps

containers are puncture-proof (metal/ high-density plastic) as reflected by the Mean of 2.6. Appropriate containers or bag holders are placed in all locations where particular categories of waste maybe generated was also sometimes practiced in the hospital as revealed by the Mean of 3.0 while the practice that "containers of infectious and pathological wastes are plastic bags/plastic-lined cardboard boxes/leak-proof" was seldom practiced in the hospitals in the City of Tabuk with a Mean of 1.4.

The above findings generally imply that wastes segregation in the hospitals are practiced as expected except the practice of "containers of infectious and pathological wastes are placed in plastic bags/plastic-lined cardboard boxes/leak-proof" which is seldom practiced. These containers are handled just like those containers of non-infectious and pathological wastes.

Waste Minimization

Table 2 presents the frequency of practice of the management practices on waste minimization.

Table 2. Frequency of Practices on waste minimization

Waste minimization	**WM**	**Interpretation**
1. Recycling plastic bottles	4.20	Often
2. Reuse of vials	4.0	Often
3. Segregation	4.0	Often
4. Composting	2.40	Seldom
Total Mean	3.65	Often

The Total Mean of 3.65 shows that the practices on waste minimization were often practiced by the respondents in the hospitals in the City of Tabuk. Waste minimization practices covered recycling plastic bottles, 4.20; reuse of vials,4.0; segregation, 4.0; and composting, 2.40. The results show that there is the practice of minimizing wastes among the hospitals by recycling plastic bottles, reusing vials, and segregating wastes in way that those infectious ones be placed in proper containers while those degradable ones can be separated for composting. It is noted however, that composting is seldom practiced. The finding could be attributed to the nature of hospital wastes where they are mostly plastics and bottles not suited for composting.

Waste Collection

Table 3 reveals the frequency of practices on waste collection.

Table 3. Frequency of Practices on Waste Collection

Waste Collection	**WM**	**Interpretation**
1. Containers are immediately replaced with new ones of the same type after collection	3.6	Often
2. Collection of general wastes is done every shift	1.81	Seldom
3. Collection of biohazard wastes is done every shift	1.81	Seldom
4. In collecting wastes, protective gear is used.	4.0	Often
5. A supply of fresh collection bags are readily available at locations where waste is produced	4.4	Often
Total Mean	3.12	Sometimes

Table 3 shows a Total Mean of 3.12 which indicates that the practices on waste collection were sometimes practiced as a whole. The result was attributed to the result of the 5 indicators under waste collection. These were the practices of a supply of fresh collection bags are readily available at locations where waste is produced with the highest Mean of 4.4 interpreted as "often" practiced; followed by the practice that in collecting wastes, protective gear is used, 4.0; and containers are immediately replaced with new ones of the same type

after collection, 3.6. On the other hand, the two practices of collection of general wastes is done every shift and collection of biohazard wastes is done every shift were both seldom practiced by the respondents as shown by the similar Means obtained of 1.81 each

Waste Storage

Table 4 shows the frequency of practice of the waste management practices on storage.

Table 4. Frequency of Practices on Waste Storage

Waste Storage	WM	Interpretation
1. Collected wastes are stored in waste storage area until transported	3.0	Sometimes
2. Number of days wastes are kept in storage area Within: 2-3 days	3.80	Often
3. Biohazard wastes are stored not more than 2 days	3.00	Sometimes
Total Mean	3.00	Sometimes

As a whole, the waste management practices on storage were sometimes practiced by the hospitals as shown by the Total Mean of 3.00. The finding was attributed to the Means obtained by the three indicators where two were sometimes practiced with one often practiced. The practices that the number of days wastes are kept in storage area within 2-3 days was often practiced with a mean of 3.80 while the practices that biohazard wastes are stored not more than 2 days both obtained a Mean of 3.0 described as sometimes practiced while the practice that collected wastes are stored in waste storage area until transported got 3.0 Mean with an interpretation of "sometimes" practiced.

It noted from the data that wastes in the hospitals are not always stored properly before they are transported for disposal.

Waste Transport

The frequency of practice of the waste management practices on transporting wastes is shown by Table 5.

Table 5. Frequency of Practices on Waste Transport

Waste Transport	**WM**	**Interpretation**
1. All bags/containers are labeled properly with basic information of content, written or attached on the bag	1.0	Never
2. The containers of HCW are robust for their content for their normal conditions of handling and transportation	4.0	Often
3. The HCW containers are tightly closed or sealed before transport	4.0	Often
4. The City Garbage Truck transport wastes	4.0	Often
5. Transport vehicles are exclusive for HCW	1.0	Never
6. Frequency of general waste transport is done 2x a week	4.0	Often
7. Biohazard waste transport is done daily Daily	4.0	Often
Total Mean	3.14	Sometimes

As a whole, the waste management practices on transport were sometimes practiced as revealed by the Total Mean of 3.14 as indicated on the table.

Seven (7) practice indicators under waste management on transport were identified from which 5 were often practiced, and two never practiced. The practices that the HCW containers are tightly closed or sealed before transport, the City Garbage Truck transport wastes, frequency of general waste transport is done 2x a week, and biohazard waste transport is done daily were perceived by the respondents to be always practiced; and the practice that the containers of HCW are robust for their content for their normal conditions of

handling and transportation were often practiced with similar Means of 4.0 while the practices that all bags/containers are labeled properly with basic information of content, written or attached on the bag and transport vehicles are exclusive for HCW were never practiced as shown by the Means of 1.0 each.

The findings generally reveal that wastes collected were not properly labeled before transporting them for disposal and there were no city vehicles exclusively for transporting wastes.

Waste Disposal

Table 6 reveals the frequency of practice of waste management practices along disposal.

Table 6. Frequency of Practices on Final Disposal

Disposal (onsite)	**WM**	**Interpretation**
1. The site is exclusive only for HCW	4.0	Often
2. Type of disposal sites for HCW Septic/ concrete vault (wastewater and infectious waste) Small burial pit(sharps)	4.0	Often
3. The site is secured from public access	3.4	Sometimes
Area Mean	3.80	Always
Disposal (offsite)	**WM**	**Interpretation**
1. The site is exclusive only for HCW	1.0	Never
2. Type of disposal sites for HCW is the Sanitary landfill	4.0	Often
3.The site is secured from public access	4.0	Often
Area Mean	3.0	Sometimes
Total Mean	3.40	Sometimes

The Total Mean of 3.40 reveals that the practices on final waste disposal were sometimes practiced generally.

Final waste disposal is divided into onsite and offsite disposal. As indicated on the table, onsite disposal practices were always practiced with an Area Mean of 3.80 while the practices along offsite disposal were sometimes practiced with an area Mean of 3.0.

Of the 3 indicators under onsite disposal, "the site is exclusive only for HCW" was often practiced with a Mean of 4.0, which means that the onsite for disposal of HCW is a site used for disposing health care wastes only. Similarly, the types of disposal sites for HCW which were either Septic/ concrete vault (wastewater and infectious waste) or Small burial pit(sharps), with a Mean of 4.0, while practice that the site is secured from public access was sometimes practiced with a mean of 3.40 an indication that there are times when the site for HCW is also used for disposing other kinds of wastes by the public. Under offsite disposal, it has 3 indicators of which 2 were often practiced with one never practiced. The indicators of "type of disposal sites for HCW is sanitary landfill" and " the site is secured from public access" both obtained Means of 4.0 each while the indicator "the site is exclusive only for HCW" got a Mean of 1.0, interpreted as "never" practiced. It is implied in the finding that the site for disposing health care wastes is the same site for the final disposal of other kinds of wastes.

Waste Treatment

The frequency of practice of the waste management practices on treatment is presented on Table 7.

Table 7. Frequency of Practices on Waste Treatment

Waste treatment	**WM**	**Interpretation**
1. HCW are treated before disposal	1.8	Seldom
2. Treatment is done onsite	1.8	Seldom
3. Type of treatment used chemical disinfection	1.8	Seldom
4. Treatment of HCW is by category	1.4	Never
5. Treatment is done to wastewater prior to discharge off-site	1.0	Never
Total Mean	1.56	Never

The Total Mean of 1.56 indicates that as a whole the waste treatment practices were never practiced. The finding resulted from the findings on the 5 indicators along waste treatment where 3 of them were seldom practiced with 2 never practiced. The 3 indicators which obtained similar Means of 1.8 each interpreted as "seldom" practiced were " HCW are treated before disposal", "treatment is done onsite" and "type of treatment used chemical disinfection".

On the other hand, the practices that "treatment of HCW is by category" and "treatment is done to wastewater prior to discharge off-site" both got similar Means of 1.0 each which indicated that the indicators were never practiced. The findings imply that in the hospitals in Tabuk City, healthcare wastes are not being categorized when treated and wastewater are not treated before disposal.

It can be deduced from the data gathered that hospital wastes are not properly treated before they are finally disposed.

Sumary and conclusions

Sumary of the HCW management practices

Table 8 shows the summary of the HCW practice

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HCW Management Practices	Mean	Description	Rank
1. Waste Segregation	3.62	Often	2
2. Waste Minimization	3.65	Often	1
3. Waste Collection	3.12	Sometimes	6
4. Waste Storage	3.40	Sometimes	3.5
5. Waste Transport	3.14	Sometimes	5
6. Waste Disposal	3.40	Sometimes	3.5
7. Waste Treatment	1.56	Never	7
TOTAL MEAN	3.13	Sometimes	

The health care waste management practices are sometimes practiced by the hospital in Tabuk City as evidenced by the Total Mean of 3.13. Of the 7 practices for implementation, 2 were often implemented. These are waste segregation and minimization with obtained means of 3.65 and3.62. Four were sometimes practiced which included waste collection, waste storage, waste transport, and waste disposal, while waste treatment was never practiced generally in the hospitals except the provincial hospital.

The data and information provides an idea that there is a need to strengthen the practice or implementation of the different practices for a better environment in the workplace and for the patients who are being served by each hospital.

Conclusion

1. The health care wastes management practices are sometimes implemented in the hospitals in Tabuk City

1.1 The waste management practices on segregation were generally often practiced

1.2 The practice that containers of infectious and pathological wastes are plastic bags/plastic-lined cardboard boxes/leak-proof" was seldom practiced
2.1Waste minimization was often practiced by the hospitals
2.2 Composting was seldom practiced
3.1 Waste collection was sometimes practiced by the hospitals
3.2 The collection of general wastes every shift and collection of biohazard wastes every shift were seldom practiced by the respondents
4.1 Waste storage was sometimes practiced by the hospitals
4.2 Storage of biohazard wastes for 2-3 days is sometimes practiced
5. 1 The waste management practices on transport were sometimes practiced by the respondents
5. 2 The practices that all bags/containers are labeled properly with basic information of content, written or attached on the bag, and transport vehicles are exclusive for HCW were never practiced
6.1 The practices on waste disposal were sometimes practiced.
6.2 The onsite disposal practices were often practiced while the offsite disposal practices were sometimes practiced or implemented by the respondents
6.3. Offsite disposal for exclusively HCW was never practiced
7.1. The waste treatment practices were seldom practiced
7.2. Treating HCW before disposal, onsite treatment and using chemical disinfection as a type of treatment were seldom practiced while categorizing HCW when treating and treating wastewater prior to discharge off-site" were never practiced.

Recomendation

1. There is a need for the DOH to monitor regularly the management of health care wastes in each hospital
2. For waste segregation, in the use of labels and color coding scheme, all body fluids and excreta should be disposed in the infectious category.
3. Waste minimization through source reduction and recycling not only of plastics but also other recyclable materials such as papers
4. Strengthen the practice of composting
5. Due to the lack of appropriate storage area, collection and transport of biohazard waste should be done daily.
6. The city government should propose a separate disposal site for all healthcare wastes and set limit to public access to decrease the risk of infectious diseases

7. Burial pits should be lined with material of low permeability, such as clay, to prevent groundwater contamination. However, burial pits are recommended if they are located within the premises of the establishment. Encapsulation is the best method for disposal of sharps and should be practiced.
8. Waste treatment should be done to all infectious wastes.
9. The KASC Midwifery Department can initiate and conduct education and information campaign (IEC) for the hospital personnel, patients and guests at least once a year

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Appendices
Research Pictorials

Figure 8. Storage for sharp objects in the Kalinga Provincial Hospital

Figure 9. Storage for biodegrable, infectious, and non-biodegrable (KPH)

Figure 10. New Disposal for waste waster (Kalinga Provincial Hospital)

Figure 11. Old Disposal for Waste Water (Kalinga provincial Hospital)

Figure 12. Storage for vials (Kalinga Provincial Hospital)

Figure 13. Storage for sharp objectives and medical supply wastes (Almora General Hospital))

Figure 10. Storage for plastic

Figure 14. Storage for medical wastes (Almora General Hospital)