

HOSPITAL WASTE MANAGEMENT PRACTICE ALERTNESS AMONG HEALTH PRACTITIONERS IN SECONDARY AND TERTIARY CARE FACILITIES IN UYO METROPOLIS, AKWA IBOM STATE

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ABSTRACT

This study evaluated the extent of curiosity to safe hospital waste management practice among principal managers of patients in care facility which are not directly saddled, primarily with managing medical waste generated in the process of care giving due to divisions in lines of duties. The study focused on analyzing the demographic characteristics of the medical practitioners, assessed the perception of the medical practitioners towards hospital waste management and assessed the pattern of alertness of medical practitioners on waste management practices in the care facilities. Both secondary and tertiary health facilities that serve the most urbanized regions of Akwa Ibom State surveyed the responses of the medical practitioners within the two facilities which made up the population of study. Descriptive statistical techniques were adopted to analyze the responses of the medical practitioners. Findings indicates the presence of vibrant and active individuals alongside well experienced practitioners, who seem to lack knowledge or in some situations, ignore technical issues surrounding waste management and disposal procedures within the facilities of their practice. They tend not to consider waste management as part of their care activities, neither are they concerned about steps involved and implemented in proper waste management procedures. There is utmost need to alongside, medical training, include environmental health education in various curricula as applicable in colleges and schools of medicine. Practitioners need to understand the health implications of improper waste management as well as standard waste management procedures that should be adopted to effectively support the monitoring of best practices within care facilities.

Keywords: Hospital, Waste, Management, Medical, Practitioner, Practice Alertness, Care Facilities, Uyo, Urban.

INTRODUCTION

In developing regions of the world, there is usually inadequate facilities to sustain high level hygiene and sanitation, especially where few facilities are responsible for providing medical care to a rising urban and rural population that visit public hospitals. When the population of

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patients outnumber the available facilities and staff, medical waste generation grows at a geometric proportion and therefore reduces the level of hygiene and sanitation within care facilities. In Nigeria, the scenario is usually the case in most public secondary and tertiary facilities. Delay in timely evacuation of waste bins becomes a ready indicator of sub-standard waste management operations. Safe medical waste management entails systematic and timely segregation of waste in line with accepted best practices. In Nigeria, this level of general waste segregation is still far from reality. Thus, despite considerable advances, clinical waste disposal procedures within hospitals remain grossly inadequate. In most hospitals, breaches in procedures occur with depressing frequency and the responsibility for the prevention of such events often falls between different professional and managerial groups. Disposal of mixed wastes are particularly difficult and procedures for the safe handling of potentially infective clinical waste contaminated with cytotoxic drug residue or radioactive substances are often breached. Many groups within the healthcare professions and commercial sector, environmental groups and local/central government, have made major contributions to improvements in the standards for collection, transport and terminal disposal of clinical waste, although considered in isolation (Blenkharn, 1995, Babayemi et al, 2009, Diaz et al, 2005 and Kaiser et al, 2001). Health practitioners are primary witnesses to biomedical waste generation, are they involved in proper waste management operations? Do they care on their treatment procedures, their management status or their final disposal? Is it part of their professional responsibility to monitor effective disposal? Could it be considered as a form of general care provided, not just to patients, but with the interest of medical well-being of the entire populace, including the practitioners? Any mismanaged waste constitutes a dangerous environmental issue. An effective and efficient program for the management of healthcare waste is a critical component of the facility's infection control program and consequently, plays an important role in the quality of care as well as in the occupational health of the entire staff of the facility (Manyele, 2004).

Theoretical Framework and Conceptual Review of Relevant Literature

Hospitals are places where patients' ill-health are diagnosed, analyzed and managed. During these activities, generation of different categories of solid and liquid wastes (biological or non-biological) is unavoidable. These different categories of wastes are discarded as "hospital wastes" (Altin et al, 2003 and Chandra, 1999). Hospital wastes come from various sources/department within healthcare facilities and are considered risk factors to both humans and the environment, their disposal becomes crucial to safety. These hospital wastes can be grouped as medical wastes, domestic wastes or infectious wastes (Manyele, 2004 and Hegde et al, 2010). "Medical waste" refers to materials accumulated as a result of patient diagnosis, treatment or immunization of human beings; "Infectious waste" refers to the portion of medical waste that is in contact with a patient who has infectious disease and it is capable of producing an infectious disease; "Domestic waste" refers to other forms of waste similar to the ones generated in normal settings at home; offices etc. These wastes may be seen at disposal in their different categories or as mixed wastes and mostly, in various quantities. The disposal of hospital waste as unsegregated waste renders such wastes potentially harmful (Pimental et al, 1998). The quantity of Bio-medical waste generated varies depending on the hospital policies and practices and the types of care being provided. The data available from developed countries indicate a range from 1-5kg/bed/day, with substantial inter country and inter specialty differences. Meagre data from developing countries indicate that the range is essentially similar but the figures are lower i.e. 1-2kg/day/patient (Soncuya et al, 1997, Altin et al, 2003 and Lee et al, 2004). About 85 per cent of hospital wastes are non-hazardous, 10 per cent are infective (hazardous) and the remaining

5 per cent are non-infectious but hazardous (chemical, pharmaceutical and radioactive) (Yadav, 2001) and represent a small amount of total residues generated in a community (Abor, 2007). In a related report, the amount of hospital waste varies in different countries of the world. In U.K the amounts of hospital waste generated by quantity was 2.5(kg/bed/day), in U.S.A, 4.5(kg/bed/day), in France 2.5(kg/bed/day), Spain, 3.0(kg/bed/day) while for india,1.5(kg/bed/day)(Chandra1999). In another report, (Lee et al, 2004) Thailand generated 1(kg/bed/day), Portugal between 2.5 – 4.5(kg/ bed/day). These variations are indications of their medical situations. Hospital waste can also be termed differently, that is, “clinical waste” or “Biomedical waste” and refers to any solid, fluid and liquid or liquid waste, including its container and any intermediate product, which is generated during the diagnosis, treatment or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biological and the animal waste from slaughter houses or any other similar establishment (Chandra, 1999). Though it can be used interchangeably, all wastes, hospital, clinical or biomedical, are hazardous and pose serious treats to life if not properly managed. Researchers in Nigeria have undertaken to study medical waste generation, but most of the studies are usually case studies of particular states. Therefore, an average medical solid waste generation in Lagos lies between 0.562kg/bed/day and 0.670kg/bed/day, in Abuja, the Federal Capital Territory, 2.78kg/bed/day was generated and in Ibadan 150g /head/day (Babayemi et al, 2009). In another report, (Bassey et al, 2006) records that the average healthcare waste generation rates in Abuja were in the range of 1.053kg/bed/day to 2.290kg/bed/day while for Ibadan 1.0kg/bed/day to 1.50kg/bed/day. Similar ranges reported for other places are Dhaka city 0.8 – to 1.67kg/bed/day, for Amsterdam 2.7kg/bed/day and for Paris 2.5. But higher ranges 1.0 – 4.5 were documented for New York City, Chile Brazil, Argentina and Venezuela. Different department also show variations in their waste generation. For instance, in Garki General Hospital, Abuja, the lowest volume 0.08kg/bed/day came from ENT unit and highest at the labour ward. This is expected because of the nature of activities in a specific ward or unit. There exist different sources of wastes from care facilities. The different sources generate these wastes due to either occupational tendencies, lifestyle or response to needs and care (Das et al, 2000). They include the following: Hospitals and associated clinics, Health Centres, General Practitioners Surgeries, Needle Exchange Schemes/Drug Treatment Centres, Public Health Laboratories, Blood Transfusion Centres, School And Company Health Clinics, Ambulance Services, Community Health Care Services, First Aid Centres, Dental Surgeries /Hygienists, Dental Laboratories, Police Services, Trauma Services (Accidents, Street Violence, Etc), Veterinary Hospital /Surgeries, Veterinary Laboratories /Pet Shops, Medical Research Institutions, Physiotherapists, Chiropractors, Tattooists, Cosmetic piercers, Acupuncturists, Osteopaths and other alternative practitioners, Funeral Parlours /Undertakers/Embalmers, Residential homes, Domestic premises from domiciliary dialysis etc, Domestic premises, Pharmacists, Armed Forces Establishments (Blenkharn, 1995). It could be observed that health or medical-related activities seem to be major sources of these wastes. The waste streams in hospitals are made up of different materials which include:- Clinical wastes, sharps, Linen, Foul or infected linen, Laboratory waste – diagnostic laboratories, research laboratories, experimental animal (bedding/carcasses, etc), Domestic refuse, Documents, Pharmaceutical wastes, Cytotoxic wastes, Chemicals, including oil, Radioactive wastes, Residues from gas scavenging systems, Food, Deceased persons /post-mortem waste, Almoner/social services (belongings from deceased persons), Glass, wastes, Sewage, Waste water, including cooling water from air conditioner systems (Blenkharn, 1995). Although the vast majority of medical waste is no more dangerous than household waste, a significant fraction of medical waste does pose some form of danger if exposed to the general public or environment in an untreated form. This is waste mismanagement. Mismanagement of hospital waste implies a

combination of improper handling of waste during generation, collection, storage, transport, treatment and disposal. When these situations are restrained, the environment is sustained to support life meaningfully thus reducing state of ill-health and therefore strain on medical facilities. But in many countries, hazardous and medical wastes are still handled and disposed together with domestic wastes thus, creating a great health risk to municipal workers (Pimental et al, 1998), the public and the environment (Abor, 2007). The safe disposal and subsequent destruction of hospital waste is a key step in the reduction of illness or injury through contact with potentially hazardous materials and in the prevention of environmental contamination (Blenkharn, 2006). As various waste are disposed differently, hospital waste has been categorized into nine different groups to facilitate the type of disposal and treatment that are appropriate. These, according to Malik (2007), are the human anatomical waste, animal waste and microbiology & biotechnology waste which can be disposed & treated by incineration or deep burial system; for sharps, incineration or disinfection, chemical treatment or mutilation can be employed; for medicines & cytotoxic drugs, incineration or disinfection and disposal in secured landfill can be used; for solid waste (blood & body fluids) and solid waste (disposable items), autoclave or chemical treatment or burial options can be applied; liquid waste(blood & body fluids) can be taken care of through disinfection by chemicals discharge into drains; for Incineration Ash, disposal in municipal landfills can be used, while for chemical waste, chemical treatment or source landfill would be an option. In the ward or clinic, medical waste is disposed into suitably labeled colour-coded plastic sacks or rigid bins, and then disposed properly (Blenkharn, 2006). This is done to separate infectious waste from others and facilitate easy identification, handling and disposal, but most importantly, it helps to control and minimize environmental contamination by mismanaged medical waste. The different colours are indications of what type of waste should be dropped into the bins. This requires basic training to ensure efficiency and to avoid mix up, a process that could be muddled up if not understood. The gap in the knowledge of the environmental impacts of healthcare products and services underscores the need for increased understanding among health professionals of the integral links between human health and environmental health. The average physician receives little, if any, occupational health training in medical school. A 1994 survey of medical school deans indicated a “minimal” emphasis on environmental education (Kaiser et al, 2001). Nurses are in a similar situation with curricula in nursing programs that normally do not include environmental education programs. This educational gap is particularly problematic because it concerns not only the potential impacts of healthcare product choices but also the understanding of attributing factors to disease processes. Some researchers claim that 45 percent of deaths worldwide can be attributed to various environmental factors, especially organic and chemical pollutants (Cannata et al, 1992). These chemicals would likely be bio-accumulative, bio-persistent and the cumulative effects can be hazardous. In view of this situation, environmental information should be integrated into the educational activities of healthcare professionals to match the changing trends in disease and illness; and to increase their consciousness of appropriate use and disposal of medical resources (Kaiser et al, 2001). This demands special management which will incorporate various personnel into the process of medical waste control such that their contributions would generate an efficient waste control procedure. Waste management procedures may not have an effective assessment without proper, regular and consistent documentations. As such, record keeping of all activities involved in waste management be enforced as obtained in European countries (Ndidi et al, 2009).

METHODOLOGY

The study was conducted in the University of Uyo Teaching Hospital (UUTH), and St Luke's Hospital, Anua, in Uyo Local Government Area (LGA) of Akwa Ibom State, Nigeria's largest oil producing state. Uyo is located centrally in the map of Akwa Ibom State in Nigeria. It situates globally between latitude 5°.05' North and longitude 7°.50' East within the equatorial rainforest belt, and it has a population of 309,573 according to 2006 National Population Census. Uyo serves a dual role as state capital as well as local government headquarters. It is bounded on the North by Ikono, Ibiono Ibom and Itu Local Government Areas; on the East by Uruan Local Government Area and on the West by Abak Local Government Area. The people speak Ibibio language and are mainly engaged in farming, trading and craftsmanship. The research design for this study was purposive sampling procedure. This was used to investigate the level of alertness by health practitioners on the status of medical waste disposal and treatment in use at these health facilities. The study population was made up of medical doctors (55) drawn from Saint Luke's Hospital, Anua and the University of Uyo Teaching Hospital (UUTH), Uyo. Primary data were collected using structured questionnaire to reflect the specific objectives of the study. Data were analyzed using descriptive statistics particularly Frequency Counts and Percentages.

RESULTS

A. Demographic Characteristics of Medical Practitioners

The study of the demographic characteristics of the health practitioners as displayed on table 1 showed a two sectional representation as primary data were taken from two different care facilities, St. Luke's hospital and UUTH within the metropolis. With reference to Item 1, from both locations, about 20% of the study population did not indicate their age ranges for some undisclosed reasons. This seems somewhat unexpected. They are learned personalities from recognized institutions who would have been well trained on and actively aware of research activities. The very nature of their profession demands that patients should supply necessary information especially, those on demand; as such, their educational exposures should have had a boost on the confidentiality of information released. For the rest of the ranges, an equal distribution was shown amongst the age brackets in St Luke's except for the bracket of 36 -50 years which had no representation. From UUTH, 32.7% of the respondents were between 24 -29 years, 30.6% were between 30 -35 years being the highest population of sampled practitioners; while 18.4% were between 36 -50 years. Item 2 shows that 80.0% were males while 20.0% were females from UUTH, indicating a male dominated profession and as well as the population that returned the completed questionnaire. Item 3 shows that 63.6% of the respondents had not exceeded 3 years in practice, 20.0% were within 4 -6 years, 10.9% were within 7 -9 years, while 5.5% of the respondents being the least and only from UUTH, were within 10 - 20 years of practice. Personnel in this category may be officially or privately engaged outside sampled facilities.

Table 1: Distribution of Responses Based on their Demographic Characteristics

| Item | Variables | Hospitals | | Total |
|------|--------------------------|-----------|----------|-----------|
| | | St Luke's | UUTH | |
| 1 | Age (in years) | | | |
| | None | 33.3(2) | 18.4(9) | 20.0 (11) |
| | 24-29 | 33.3(2) | 32.7(16) | 32.7(18) |
| | 30-35 | 33.3(2) | 30.6(15) | 30.9(17) |
| | 36-50 | - | 18.4(9) | 16.4(9) |
| 2 | Sex | | | |
| | Male | 100(6) | 77.6(38) | 80.0(44) |
| | Female | - | 22.5(11) | 20.0(11) |
| 3 | Years of practice | | | |
| | 1-3 | 50.0(3) | 63.3(32) | 63.6(35) |
| | 4-6 | 33.3(2) | 18.4(9) | 20.0(11) |
| | 7-9 | 16.7(1) | 10.2(5) | 10.9(6) |
| | 10-20 | - | 6.1(3) | 5.5(3) |

B. Assessment of Medical Professional Perception on Appropriate Waste Management Practices within the Care Facilities

On the review of responses on appropriate waste management practices within care facilities. Table 2 shows that 65.4% of the respondents consented to the fact that there are hospital waste classified as special, as much as 18.2 % had no idea on the issue, while 16.4 % said there was none. It is surprising that principal managers of people with different categories and severity of medical conditions would lack of knowledge on or refute the existence of special wastes generated in care facilities. Why do they use gloves, the commonest protective gadgets, when attending to a patient? Is it cosmetics or for protection? If for protection, from what? With reference to Item 2, the manner of waste disposal had diverse opinions, the use of waste bins showed 5.5% acceptance, the use of incineration method showed 43.6%, the use of open bins showed 18.2%, capping showed 1.8%, incineration and burying had 5.5%, opinions on incineration and open dumping as well as open burning had 3.6% each while 18.2 % indicated lack of knowledge on the manner of waste disposal, which is indifference to disposal operations of hospital waste. None of the respondents mentioned treatment before waste disposal. Item 3 showed that on storage before disposal, 21.8% had no idea, showing lack of interest on safety even immediate working environment; 10.8% indicated use of waste bins, 51.4% indicated use of special bins, 5.5% identified segregation, 1.8% mentioned waste policy, 1.8% mentioned use of black plastic bags and 1.8% identified treatment. It is obvious that some practitioners do not consider waste management as part of care delivery that demands their utmost attention.

TABLE 2: Distribution of Responses by Medical Professional Perception on Appropriate Waste Management Practices within the Care Facilities

| Item | Variables | Hospitals | | |
|------|---|-----------|-----------|-----------|
| | | St Luke's | UUTH | Total |
| 1 | Are there any hospital waste classified as special | | | |
| | No | 16.7(1) | 16.3(8) | 16.4 (9) |
| | Yes | 33.3(2) | 69.4(34) | 65.4 (30) |
| 2 | What is the manner of disposal of these items | | | |
| | Waste bins | - | 6.1(3) | 5.5(3) |
| | Incineration | 50.0(3) | 42.9(21) | 43.6 (24) |
| | Opened bins | - | 20.4(10) | 18.2(10) |
| | Capping | 16.7 (1) | - | 1.8 (1) |
| | Incineration & Burying | - | 6.1(3) | 5.5 (3) |
| | Incineration & open dumping | - | 4.1(2) | 3.6 (2) |
| | Open burning | 33.3 (2) | - | 3.6 (2) |
| | No idea | - | 20.4 (10) | 18.2 (10) |
| 3 | How should these items be stored before collection | | | |
| | No idea | 16.7 (1) | 22.4(11) | 21.8 (12) |
| | Waste bins | 16.7(1) | 10.2(5) | 10.9(6) |
| | Special bins | 50.0 (3) | 52.2 (28) | 51.4 (31) |
| | Segregation | - | 6.1 (3) | 5.5 (3) |
| | Waste policy | - | 2.0(1) | 1.8 (1) |
| | Black plastics bags | - | 2.0(1) | 1.8(1) |
| | Treatment | 16.7 (1) | - | 1.8(1) |

C. Assessment of Medical Practitioners' Alertness on Waste Management Practices in the Care Facilities

The data on table 3 shows that on Item 1, 52.7% of respondents had no idea on documentation procedures, 36.4% said such procedures do not exist while 10.9% agreed to documentation of waste at collection. This indicates that majority of practitioners are not conscious of appropriate procedures relating to their profession. Item 2 showed that 98.2% of respondents are aware of hospital possession of clinical sharp boxes while 1.8% said there were none, these practitioners may drop used sharps just anywhere regardless of potential effects. Item 3 showed that 80.0% of respondents had no idea of licensed waste management agency in collaboration with their facilities, reflecting neglect environmental protection ethics; 7.3% said none was in existence and 12.7% named some agencies they knew on such engagements.

Table 3: Distribution of Medical Practitioners' Responses on Alertness in Waste Management Practices in the Care Facilities

| Item | Variables | Hospitals | | |
|------|---|-----------|-----------|-----------|
| | | St Luke's | UUTH | Total |
| 1 | Are there any documentations when these waste are collected | | | |
| | No idea | 33.3(2) | 50.1 (27) | 52.7 (29) |
| | No | 4(66.7(4) | 37.7(16) | 36.4 (20) |
| | Yes | - | 12.2(6) | 10.9 (6) |
| 2 | Are there any clinical sharps box in the hospital | | | |
| | No | 16.7(1) | - | 1.8 (1) |
| | Yes | 83.3(5) | 100(49) | 98.2(54) |
| 3 | Which licensed waste mgt. company takes care of the hospital waste | | | |
| | I don't know | 33.3 (2) | 85.7(42) | 80.0 (44) |
| | No | 66.7(4) | - | 7.3(4) |
| | Named | - | 14.3(7) | 12.7(7) |

DISCUSSION

Every profession thrives on the availability of capable personnel. The data analyzed indicate the presence of young, active and vibrant individuals in the profession, a situation that reflects able hands in providing a holistic health services, giving out medical interventions as well as safeguarding the wellbeing of other medical experts and officers, administrative staffs, support staff, the hospital environment, the global environment and even visitors. This is about contributions, though not defined or direct, but geared towards maintaining a healthy environment and demands dependable hands. Thus, in Table 1, the presence 32.7% of active medical practitioners seems very encouraging. The task may be additional to official responsibilities but with the male population of 80.0%, it is of advantage to overseeing appropriate practices. More so, the distribution shows different years of experience which could inform adequately on retro infections or nosocomial conditions, relating to poor waste management. The responses on Table 2 showcases the attitude of practitioners to appropriate waste management practices within care facilities. The majority of the practitioners, 65.4% recognized some hospital wastes as special, but that as much as 18.2% had no idea and 16.4% felt there was none, indicates their shallow knowledge on hospital wastes – the product of their expertise. On the manner of disposal, singular ideas were prevalent. This was shown by the mention of just a means of disposal which would not adequately cater for all categories of waste. There was no mention of waste treatment, an indication of lack of knowledge on proper waste management. Some options mentioned would not be appropriate for disposing waste, they may be either for temporary storage awaiting collection or an aspect of taking care of a particular waste item. Other items mentioned falls into improper waste disposal methods. Still others, 18.2%, knew nothing about means of disposal. Answers given on the manner of storage before disposal seem to show a kind of mix up with the responses introducing segregation obviously, health professionals know little about occupational health standards (Kaiser et al, 2001). This affects their pattern of thought on medical waste management. Seemingly, these professionals exclude their involvement in ensuring appropriate operational activities in this regard. The Table 3 assessment of practitioners' alertness on waste management practices tend to correlate with the gap in the knowledge

level of practitioners. Their responses show no form of documentation during waste collection while the availability of sharps box had a unanimous affirmation. Majority of the respondents, 80.0%, had no information on the availability of licensed agencies in charge of waste operations. These responses indicate that medical practitioners lack interest in activities concerning waste management, and interest could be triggered by knowledge. In the absence of relative information anomalies are expected. The anomaly is the lack of health knowledge which is expressed by experts who seem to isolate issues on human health from environmental health. The educational gap, unbridged, could explain the trends in global deaths attributed to various environmental factors (Cannata et al, 1992). There had been several observed cases, which may not have been published, in which patients as well as their caregivers went down with medical conditions that were not recorded before hospital admission and were traced to exposures to infections within care facilities. Therefore, in line with other reports, environmental information should be integrated into the educational activities of healthcare professionals to increase their consciousness of appropriate use and disposal of medical of medical resources (Kaiser et al, 2001) and also to be actively involved in monitoring the disposal procedures engaged by the facilities in which they facilitate health services.

CONCLUSION

Medical waste generation has been in existence ever before formal healthcare facilities were established in different locations of human settlements, but the increase in its amount, management procedures and impact both in the primary environment and in extended locations are at an alarming status. It is common to sight clinical sharps and disposables, especially those that do not decompose readily, at public dumpsites. These are materials used by health practitioners in the course professionalism yet they are littered in public dumpsites posing great dangers, not only to immediate users of care facilities or the scavenger population but also to the environment at large. Practitioners should be concerned about effective management of their professional wastes.

ETHICAL APPROVAL

All authors declare that verbally informed consent was obtained from the respondents which was evident by their willingness to participate in the survey and complete the questionnaire. The survey study had committee considerations and received written consent from the University of Uyo Teaching Hospital, UUTH and verbal approval from the management of St Luke's Hospital, Anua, Uyo Local Government Area. The study was conducted in accordance to the tenants of the Helsinki Declaration of 1964 as amended in 2000.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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