The Environmental Health Condition of The New University of Port Harcourt Teaching Hospital.

Type of Article: Original

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ABSTRACT

Introduction: The hospital plays a significant role in modern health care delivery; while it provides an avenue for the treatment of patients, it can also encourage the transmission of several disease agents. Environmental interventions are routinely used to make the hospital safe. This study examined the facilities at the permanent site of the University of Port Harcourt Teaching Hospital (UPTH), a 510 bed multi-specialist hospital in Port Harcourt, south-south Nigeria.

Method: The study was carried out using an assessment checklist originally developed by the WHO. Data collected include the quantity and quality of water provided for services in the hospital; the number, types and maintenance of the toilet facilities; the building design as it relates to ventilation; and the methods used in the hospital for the control of mosquitoes.

Results: The hospital was built on a marshy ground, and was heavily infested with mosquitoes. It needed 24, 776 liters of water daily for its services, which was provided from an underground source, though the water was not routinely disinfected. Although the hospital had an average of 5 toilets in its out-patient clinics, and one toilet for every 12.75 in-patients; open defecation was however common, especially close to the in-patient wards. The in-patient wards had large windows, but the out-patient clinics had poor natural lighting, small windows and had to rely on massive air conditioning sets for ventilation.

Conclusion: The permanent site of the hospital had all the facilities required for the safety and comfort of clients and staff, but maintenance has been an expensive and difficult task. Technologies and designs suitable for the tropical environment, hard-wearing, durable and culturally sensitive are hereby recommended.

Keywords: Patient safety, environmental health condition, University of Port Harcourt Teaching Hospital, Port Harcourt

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INTRODUCTION

The hospital plays a significant role in modern health care delivery; while it provides an avenue for the treatment of patients with several ailments, it can also encourage the transmission of several disease agents, either due to the congregation of the pathogens in the hospital environment, or the presence of immuno-compromised in the hospital. Hospitals have indeed been epicenters of outbreaks of certain diseases, including tuberculosis[1], diarrhoeal diseases[2], and viral haemorrhagic diseases[3]. It is estimated that 5 -30% of patients a year develop one or more infections during a stay in hospital, costing as much as one billion Pounds a year to treat, in England alone[4]. This public health problem is further exacerbated by the growing incidence of diseases such as AIDS that result in greater hospitalization and susceptibility; hence the urgent need for more proactive efforts in the prevention of nosocomial infections.

Environmental interventions are routinely used to make the hospitals safe for the patients, carers, health workers and the environment[5]. These interventions include the supply of good quality water in adequate quantity, the proper disposal of excreta and health care waste, vector control, building design to ensure adequate ventilation, amongst others[5]. The interventions have also been found to improve patronage and the quality of care in the hospitals, especially as services could be disrupted due to shortage of water, electricity and other supplies. Apart from this, hospitals with good environmental standard provide a good educational opportunity for the promotion of safe environment in homes, and in other community settings[5].

The University of Port Harcourt Teaching Hospital officially moved to its permanent site in October, 2006. It has a stated vision of becoming a world class, five star hospital, capable of providing excellent medical services, manpower training and research; to the satisfaction of clients, staff, and the society at large. This study examined the facilities at the permanent site of the University of Port Harcourt Teaching Hospital (UPTH) to ascertain their adequacy for the delivery of five star hospital services, while guaranteeing the safety of patients, staff and the environment.

MATERIALS AND METHODS

Study Site: The study was carried out in the University of Port Harcourt Teaching Hospital, one of the two tertiary health care institutions in Port Harcourt, the capital of Rivers State, south-south Nigeria. Although located in Port Harcourt, the catchment area of the hospital extends beyond Rivers State, to include much of the Niger delta region; a catchment population that can be conservatively put at ten million people. The hospital is a 510 bed multi-specialist teaching hospital that offers not only tertiary health care services, but also secondary

and primary health care, due to the near collapse of the other facilities in the State and region. It is heavily patronized with average bed occupancy of more than 78%, and a daily average out-patient attendance of 624. It carries out an average of 8.42 surgical operations every day, and handles an average of 9.24 deliveries each day.

Study Design: A descriptive cross-sectional study design was used, with the data collected through field observation, using an assessment checklist adopted from WHO guidelines[5].

Data Collection: The study tool was adopted from a rapid assessment tool developed by the World Health Organization for assessing the essential environmental health standards in health care institutions[5]. The checklist was used to assess the quantity and quality of water provided for services in the hospital; the number, types and maintenance of the toilet facilities; the building design as it relates to ventilation; and the methods used in the hospital for the control of mosquitoes. The assessments consisted of direct observations, spot checks and rating checks.

Data Analysis: The data collected were manually checked for consistency and completeness; and then analyzed using a pocket calculator. Summary measures were calculated for each outcome of interest. The water needs of the hospital was assessed based on the minimum WHO target of 5 liters of water for every out-patient consultation, 40 60 liters/ day for every in-patient, and 100 liters for every deliveries or surgical operation carried out; while the number of toilet facilities required in the hospital was determined using the WHO target of one toilet per 20 in-patients[5]. The toilets were considered to be in hygienic condition when no faeces was seen in the toilet bowl, floor or wall, and no fly seen within the toilet[6].

RESULTS

The hospital was built on a marshy ground, though it was rarely flooded, due to a good network of surface and underground drainage system. It was however surrounded by several impounded water bodies; and heavily infested with mosquito, which the hospital management tackled with quarterly spraying of residual insecticide, insecticide-treated bed nets (ITN) and window screens, but with very little success.

The hospital needed 24, 776 liters of water daily for its services, based on the WHO benchmarks for hospitals. This was provided from an underground source, using three 15 horsepower water pumps that alternate to supply the water; and storage tanks with a cumulative capacity of 50, 000 liters. There was also an emergency water supply for the in-patient wards and the operating theaters. The water from all the sources was however not disinfected, as the chlorination that was initially tried could not be sustained due mainly to lack of funds.

The hospital had an average of 5 toilets in its out-patient clinics, one toilet for every 12.75 in-patients and a wash-hand basin for every 10.63 in-patients, which meet the WHO minimum requirements. All the toilets were of the conventional water closet flush variety, and only 11 (16.92%) of the toilets were found to be in poor hygienic condition. Open defecation was however noticed in the hospital, especially close to the in-patient wards.

The in-patient wards had large windows that occupy at least half of the walls, but the main out-patient clinics had poor natural lighting, small windows and had to rely on massive air conditioning sets for ventilation.

DISCUSSION

The study shows that though the new University of Port Harcourt Teaching Hospital was built with the facilities needed for the safety and comfort of patients, carers, and the health staff, the design of the buildings however did not take full consideration of the tropical environment and the epileptic nature of public social amenities. This was sorely demonstrated in the out-patient clinics of the hospital where the supposedly modern hospital design of low ceilings, small windows and mechanical ventilation were used without meeting the requirement of 6 12 air changes per hour, needed to prevent air-borne noscomial infection[7]; because of the erratic electricity supply and poor maintenance culture[8, 9]. Better ventilation could have been achieved at lesser expense, had natural ventilation been given greater priority as is the case in older hospitals[8, 10]. Natural ventilation is better suited to the tropical environment because it encourages heat loss from the building, even as it provides comparable level of protection against airborne noscomial infection as mechanical ventilation. A study carried out in eight hospitals in Lima, Peru had found that opening windows and doors achieved a median ventilation of 28 air changes/hour (ACH), more than double that of mechanically ventilated negative-pressure rooms. It also found that 39% of susceptible individuals in a mechanically ventilated room would become infected following a 24 hour exposure to infectious tuberculosis patient, compared to 11% in naturally ventilated hospitals with wide, open windows and doors[8].

The massive mosquito problem of the hospital was tackled with indoor spraying of residual insecticide, the use of ITN, and window screens, with little relief. Although these are proven malaria control measures, they are however less effective against nuisance mosquitoes like culex, aedes and Anopheles subpitus that bite with great intensity, from dusk to dawn, and are bred in large numbers in the marshy surrounding of the hospital[11, 12]. The most sustainable option for the control of mosquitoes in the hospital is perhaps the use of biological and environmental modification measures that specifically target the larva and breeding sites of the mosquitoes[12]. The use of larvivorous fish such as Gambusia affinis (mosquito fish), and the filling of the marshes, or their drainage with plants like the Eucalptus tree have been used with great success in similar situation[12].

The hospital needed about 25, 000 liters of water daily, considering its bed occupancy rate, the number of out-patients seen, and the number of deliveries and surgical operations carried out in the hospital. The WHO sets a minimum target of 5 liters of water for every out-patient consultation, 40 60 liters/ day for every in-patient, and 100 liters for every deliveries or surgical operation carried out[5]. The hospital had been able to meet these water requirements, but at great cost, as it has to pay a contractor to ensure the optimum operation of its water facilities. The fact that the chlorination of the water had to be discontinued points to the strain the management of the hospital was going through to ensure that adequate water is

supplied for the services in the hospital. This is unfortunate considering that residual chlorination ensures that the microbiological quality of the water is maintained at the point of use, even with the minor contamination that might be inevitable along the labyrinth of pipes that serve all parts of the hospital[13].

The hospital had an average of 5 toilets in its out-patient clinics, and one toilet for every 12.75 in-patients, which meet the WHO minimum requirements[5]. However, the fact that open defecation was still observed in the hospital showed inadequate access, and perhaps a reluctance to use the toilet facilities, especially as the toilets were all water closet systems that had to be sat upon[14, 15]. People in Nigeria traditionally prefer the squatting position during defecation, and would feel uncomfortable to sit on the toilet seat, especially when the toilet is being shared with many other persons[14].

Also, the WHO minimum standard for toilet was perhaps set without taking into full consideration that in-patients in Africa often require up to three family members to attend to their needs. The solution to open defecation in the hospital might lie in the construction of public toilets, to complement those already available. But these toilets should have a variety of toilet facilities, especially the squat varieties; to give every individual an opportunity to use a toilet facility that meets his/her preferences[15].

CONCLUSION

The permanent site of the University of Port Harcourt Teaching Hospital was built with a modern hospital design, and provided with all the facilities required for the safety and comfort of clients and staff. However the maintenance of these facilities has been an expensive and difficult task for the management of the hospital. It is therefore recommended that technologies used in hospitals in Nigeria should be suitable for the tropical environment, hard-wearing, durable and culturally sensitive.

Conflicts of Interest of each author/ contributor: None, except that the study was a fall out of the statutory responsibility of the authors as consultant and Resident Community Physician with special interest in Environment Health

Acknowledgment: We wish to thank the staff of the Environmental Health unit of the University of Port Harcourt Teaching Hospital for assisting in data collection, and the Management of the hospital for providing the impetus for the study. The opinions expressed in this article are however entirely those of the authors.

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