

Hospital Equipment Management in District Base Hospitals in Kalutara District in Sri Lanka

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Abstract: Introduction: Medical equipment management is important as human resource management to function a hospital in a maximum capacity. Accurate and comprehensive data are needed in order to have a good equipment management. It has several domains such as, procurement, accept, inspect, install, ensure performance within the accepted standards, safe and effective use, maintenance and service, repair, eventual retirement and disposal. Quality hospital equipment management is also important to reduce accidents caused by improper handling of unsafe equipment to the patients and staff. Objective: To assess the current practice of hospital equipment management in District Base Hospitals (DBHs) in Kalutara District in Sri Lanka. Methodology: This was a hospital based cross sectional descriptive study conducted at the DBHs in Kalutara district in Sri Lanka. All the healthcare managers at different levels engaged in hospital equipment management were included in this study. Results: All hospitals reported lack of efficient equipment management system and all hospitals were found to be without guidelines for procurement of equipment. Most of the hospital departments (85.4%) do not have proper register maintained for equipment maintenance. Only about very few wards (14.6%) had an equipment maintenance register, but all these registers were lacking necessary details. Conclusion and recommendation: The findings of this study revealed that hospitals do not have proper management of their equipment. Processes of equipment management can be re-engineered with implementation of computerized management system to have a good quality hospital equipment management system.

Keywords: Hospital Equipment Management, Procurement, Maintenance Register

1. Introduction

Healthcare service environment in a hospital consists of two main components, one is human resource and the other is logistics and equipment [1]. Good quality healthcare service is totally depending on a proper management of both these components. To create a safe, secure and to promote quality patient care services to all patients, staff and visitors, hospital management should pay much attention to hospital equipment management. Hospital equipment management is not a simple process. Medical equipment are used in the diagnosis, treatment and monitoring of patients. Accurate and comprehensive data are needed in order to have a good equipment management [1, 2]. The Healthcare technology management cycle is described in figure 1.

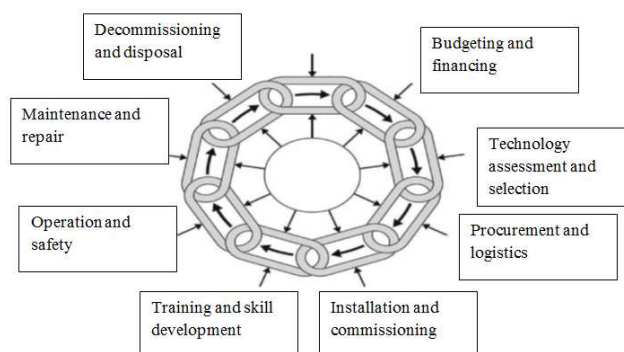


Figure 1. Health care technology management cycle.

It has several domains such as, procurement of an equipment, acceptance, inspection, installation, ensure performance within the accepted standards, safe and effective use, maintenance and service, repair, eventual retirement and disposal.

Quality hospital equipment management is also important

to reduce accidents caused by improper handling of unsafe equipment to the patients and staff [1, 6, 7]. Most of the hospitals in developed countries have their own electronic hospital equipment management system installed to their hospital information system. To ensure proper hospital equipment management system basic, accurate and update records are needed such as, nomenclature, manufacturer, nameplate model, serial number, cost, maintenance assessment [2, 3, 4,]. Other useful data includes, warranty, location, other contractor agencies, scheduled maintenance due dates and intervals and service agreement. These fields are vital to ensure appropriate maintenance is performed, to ensure device is safe to use in patient care [4].

Justification

Most of the instances hospital healthcare managers are keener on human resource management in order to have better health outcomes but pay less attention to hospital equipment management [8]. Once an equipment is ordered, received and installed, then the management does pay less attention to it until somebody who works with the machine comes and put a complain about the machine. Most of the occasion hospital management pays attention to equipment when it is broken or not functioning in proper order. Then only he/she pay attention to the service agreement but may be too late that the warranty period expired, realize that the recommended services to the equipment were not done timely. This will cost more than expected to the hospital thus to the government [9, 10, 11]. It also affects the delivery of good quality healthcare service to the patients. Use of improperly managed equipment with fault may cause harm to the patient, staff as well as to the visitors sometimes. These problems occur in our day today management in hospitals due to lack of proper hospital equipment management plan [12, 13].

Objective: To describe the current practice of hospital equipment management in the District Base Hospitals in Kalutara District in Sri Lanka.

2. Methodology

Study Design

This study was a hospital based cross sectional descriptive study to assess the current practice of hospital equipment management in the District Base Hospitals (DBHs) in Kalutara District in Sri Lanka.

Study Setting

This study was conducted at the DBHs in Kalutara District in Sri Lanka. There are three DBHs in Kalutara district namely Horana, Panadura and Pimbura.

Study Population

There are different basic and other specialty units within hospitals including Out Patient Department (OPD), Emergency Treatment Unit (ETU), medical units, surgical units, gynecology and obstetrics units, pediatric units, radiology unit, theaters, blood bank, laboratory. The Principal Investigator (PI) collected total number of health care managers at different levels, nursing sisters, nurses and

others responsible persons handling equipment in those units and all of them were included in this study to get the information for the self-administered questionnaire, key informant interviews and for the focus group discussions.

Study Instrument

A Self-Administered Questionnaire (SAQ), key informant interviews and focus group discussions were used to describe the current practice of hospital equipment management in DBHs.

Selection and training of interviewers

The PI selected four undergraduates as interviewers. The PI trained four undergraduates giving them full knowledge on assessment tool, the questionnaire and to record Focus Group Discussions (FGDs). The objective of the study was explained by the PI during the training and importance of the maintenance of confidentiality was explained.

Pre test

All the study instruments were pre tested at a selected hospital. Problems during the pretest were identified and the necessary improvements were made following the pretest.

Data analysis

Quantitative data was analyzed using Epi info and Statistical Package of Social Sciences (SPSS). The data entry was totally done by the PI. The accuracy of data entry was ensured by introducing valid checks and re-entering a selected sub-sample and comparing them with the original data set. Basic descriptive analysis was presented by frequency distribution tables and graphs. The appropriate statistical tests were used to describe the significance of the tests.

Identification of potential risks/benefits

The study was not contained an invasive procedures as such so there were no risk to the participants.

Findings of this study, including recommendations, were disseminated to relevant authorities. The findings will improve the understanding of health managers who are involved in hospital equipment management. The findings of this research will help health authorities to take measures to improve the hospital equipment management among health care units, and thus to improve the patient care and to give better service to the patients.

3. Results

The response rate for the SAQ was 92%. The participation to the key informant interviews were 100% and participation to the FGDs by medical managers were 100%, Nursing sisters were 91.85 and nursing officers and other heads of the departments were 73.4%.

The study included three District Base Hospitals. There were 137 participants, included 04 medical managers, 08 matrons, 35 nursing sisters, 58 nursing officers and 32 other responsible persons at different units in three DBHs.

Out of the total, all three (100%) hospitals reported lack of efficient equipment management system as a main problem.

Procurement

All hospitals were found out to be without guidelines for

procurement of equipment. Among health care managers, most of them (113, 82.5%) were agreed on that they have no guideline for procurement (Table 1).

Table 1. Major issues on medical equipment procurement by healthcare managers.

	Number	Percentage
Lack of proper guideline	113	82.5
Lack of experts on Health Technology	56	40.9
Assessment or lack of health economists		
No clear and viable specifications	108	78.8
Get the procurement within very short period hence lack of time to assess	85	62.0
Lack of proper system of selecting appropriate technology	98	71.5

Availability of clear and viable procurement specifications was another main problem. All three hospitals (100%) have no clear and viable specifications to equipment procurement. Almost all hospital managers have no established system to select appropriate technology in procurement.

Medical Equipment maintenance

Healthcare managers were asked to respond regarding the major problems/challenges they faced in the field of medical equipment maintenance. After analysis of the data it was found that the main problem of medical equipment maintenance was lack of proper guideline. Major challenges on equipment maintenance showed in table 2.

Table 2. Major challenges on equipment maintenance by healthcare managers.

	No	Percentage
No challenge	01	7.3
No proper guideline	112	81.8
Lack of information in service agreement	98	71.5
Lack of supervision	76	55.5
Lack of Interest by the service providers	102	74.5
Lack of interest by the hospital management	54	39.4

Most of the hospital departments (85.4%) do not have proper register maintained for equipment maintenance. Only about very few wards (14.6%) had an equipment maintenance register, but these registers were lacking some necessary details such as, date of purchase of equipment, date of installation, service agreement, warranty period, accessories provided, free services availability, date of next free service, breakdown record and maintenance record.

Donation

All hospitals received donated medical equipment. The main feature that all the healthcare managers agreed on was, these donations were not based on their requirement. In addition, health managers do not have system to trace these donations. Some medical units have donated equipment which did not enter in to the hospital inventory even. Therefore it was a common feature in all three hospitals seen that, some wards have equipment which were not ordered from the proper channel, not entered into hospital inventory and installed without permission from the head of the institution.

4. Discussion

Results found in this study revealed a lack of proper medical equipment management system as similar to study in Ethiopia [4] but as compared to other studies conducted in countries with similar conditions [3, 5] this study revealed a higher gap in medical equipment management system. Most of the hospitals in developed countries have their own computerized hospital equipment management systems which enable good quality equipment management [14, 15]. Good quality equipment management includes proper procurement/selection, purchase, installation, maintenance, and disposal equipment with all necessary documents to be retrieved whenever necessary in order to deliver safe, effective and quality healthcare to the public [4, 5, 15].

5. Conclusion and Recommendation

Most of the hospitals do not have a proper medical equipment procurement plan or guideline. Most of the healthcare managers do not have proper guidelines to procure medical equipment as well as lack of healthcare technology assessment before procurement of equipment. Maintenance of records on equipment was not satisfactory. The findings of this study revealed that hospitals do not have a good equipment management system. Processes of equipment management can be re-engineered with implementation of computerized information management system in order to have a good quality hospital equipment management system.

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