

INVESTIGATING CONDITION OF MEDICAL EQUIPMENT AND ITS RELATION WITH MANAGEMENT OF MAINTENANCE RELATED TO EQUIPMENT IN HYGIENIC-MEDICAL CENTERS OF KOHGILOOYE BOOYER AHMAD PROVINCE

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ABSTRACT

Introduction: The importance of medical equipment and increasing progress in technologies related to them are specified and obvious in health system, as nowadays achievements of medical sciences experts are indebted using this technology in prevention, diagnosis and treatment of disease. Despite the importance of management of maintenance related to medical equipment, they have not focused on this issue consumedly. On the basis of this, the purpose of this study was investigating condition of medical equipment and its relation with management of maintenance related to equipment in hygienic-medical centers of Kohgilooe Booyer ahmad province. **Methodology:** This descriptive-sectional study was performed on 115 employees of hygienic-medical centers in Kohgilooe Booyer ahmad province. Data were collected by using checklist of investigation management of maintenance related to medical equipment. Collected data were analyzed by using SPSS, version 21 (a statistical software). **Findings:**

Results of this research indicated that 71% of hygienic-medical centers and staff of group, don't have medical equipment and none of experts in hygienic-medical centers have

professional certificate of medical equipment. Hygienic-medical centers on the basis of having certificate of medical equipment, training, repairs and maintenance of medical equipment respectively 16%, 17%, 6% and 7% are in proper conditions. Results indicated that management of maintenance related to medical equipment in hygienic-medical centers is weak and there are meaningful statistical relations between management of medical equipment and having certificate of medical equipment, training, repairs and maintenance of medical equipment and if the condition of these items be higher, the condition of management of maintenance related to medical equipment will be more proper. **Conclusion:** According to obtained results from the study, hygienic-medical centers don't have desired conditions in aspects of management of maintenance related to medical equipment. It seems that having an expert in medical equipment in staff of hygienic-medical centers, is necessary. Also increasing level of awareness related to personnel who use medical equipment in hygienic-medical centers and in management of medical equipment will be more effective.

KEYWORDS: Management, maintenance, medical equipment, hygienic-medical centers.

INTRODUCTION

Medical services have been as the most fundamental and important needs of human societies and meantime, medical equipment have important roles in proper presentation of these services. The importance of medical equipment is such that, many great achievements in medical sciences are indebted them. One of the major gorges is cost in care-health system of medical equipment and more than 30% of costs related to each bed of hospital in year are assigned to equipment that have included great shares of budget in hygiene and care.^[1]

Medical equipment greatly help in medical diagnosis, care and training and investigating for experts, surgeons, doctors, nurses and experts in diagnostic and medical units and each year many shares of hospital's costs (annually about 5-15%) assigned to purchase of medical equipment (such as devices of radiology, experimental Eliezer ironing machines, microscopes of surgery, monitors of operating room, ICU and CCU, ventilators, anesthesia machines, electroshock, electro cautery and so o.) in or out of the country.^[2]

Medical equipment have special roles in increasing health and safety of society and their proper and optimized management on the basis of hygienic and medical economic, medical education and investigation can considerably effects on national development of each

country. In all public, private and cooperative sectors, medical equipment have special importance and attention in economical and management views.^[3]

The process related to management of medical equipment starts with realization of needs related to an organization and ends by their destruction. This process includes way of good purchasing, financial aid, request and presentation, shipping, delivery, installation and launching, management of stock, repair and maintenance, proper usage, education and measuring medical effectiveness.^[4]

On the basis of performed researches by WHO, more than 60% of medical equipment have been not used in developing countries and facilities of maintenance and repair aren't existed for them.^[5] Studies indicated that costs of repair and maintenance related to medical equipment are more expensive in developing countries than industrialized countries.^[6] So because of lack of managing medical equipment such as: improper structure, lack of required infrastructure for purchasing and preparing, maintenance, education and using imported technology, wasting national hygienic resources will be continuously lasted.^[7]

Many medical equipment in hospitals related to developing countries have weak qualities (96%), they only work for 5 years after installation and 39% never work because of lack of training, catalogue or side accessories.^[8]

Lack of technical certificates related to equipment, not obeying international standards of equipment, improper purchase of equipment resulted from ignorance concepts of technical experts and lack of consumable accessories and parts^[2] and not using equipment because of lack of skill in working with them, are some of these problems.^[9] On the basis of performed studies, lack of proper medical equipment is the factor in creating medical errors and annually mortality of 400 people in England.^[10] Also studies indicated that about 60% of medical equipment in hospitals of medical sciences university in Iran, have not been investigated by evaluation of employees related to their sections.^[1]

Management of medical equipment is a continuous problem in developing countries. This problem is as shortage in numbers of equipment or quality of equipment^[8], as only by executing one of the parts of managing medical equipment means that preventive maintenance, we can 45-50% reduce costs of repairs.^[5] Halbovachz in a study indicated that executing plan of proper management of medical equipment in developing country can twice

increase helpful life of their lives devices.^[11] Dargahi and colleagues in their study indicated that studied sections in hospitals don't have proper medical equipment on the basis of management and also according to criteria of ability and way of using devices in these hospitals they are not observed.^[12] Sajadi and colleagues considered management of maintenance related to medical equipment in hospitals of medical sciences in Esfahan as average.^[13] According to above problems, the purpose of this study is investigating condition of medical equipment and its relation with management of maintenance related to equipment in hygienic-medical centers of Kohgiluyeh Booyer ahmad province.

METHODOLOGY

This study was done by the ways of descriptive and sectional in 2015 and in hygienic-medical centers related to medical sciences university of Kohgiluyeh Booyer ahmad province. After coordinating with responsible people in hygienic-medical units, information were completed by checklist among responsible experts in developing staff of unit, responsible people in hygienic-medical centers and technicians of these centers. Table 1 represents numbers of studied hygienic-medical centers in cities of Kohgiluyeh Booyer ahmad province.

The used device in this study is checklist of measuring management of medical equipment which was codified by the researcher as self-structured and by using concerned resources. This checklist is from checklist of measuring condition related to management of hospital equipment and includes seven parts. The first part includes public information and items such as having expert in medical equipment, certificate of expert in medical equipment, being full-time of expert in medical equipment, having unit of repairs in medical equipment, creating committee in medical equipment and so on are investigated. The second part includes questions of certificated related to medical equipment that is investigated by 8 questions. The third includes questions of investigating education of medical equipment that is investigated by 11 questions. The forth part includes questions of safety and protection of medical equipment that is investigated by 10 questions. The fifth includes questions of repairs related to medical equipment that is investigated by 14 questions. The sixth part includes questions of maintaining medical equipment that is investigated by 7 questions and the seventh includes questions in sterilizing medical equipment that is investigated by 9 questions. Responding is as yes or no and yes has one and no has zero points. Collected data were analyzed by using SPSS statistical software (version 21).

RESULTS

Results indicated that 33 (7.28%) of studied medical centers have experts in medical equipment that none of them have professional and educational certificate in medical equipment. In studied centers, 17 (7.14%) of centers have suitable devices in primary repair. 2.92% of studied centers don't have proper areas for maintaining medical equipment. 17 centers of studied centers formed committee of medical equipment which 10 centers according to instructions and 8 centers regularly and monthly have formed this committee.

Results indicated that experts, responsible people in hygienic-medical centers and technicians, have reported management of maintaining medical equipment in centers under their supports as weak and average, as 43% weak and 53% were reported average. Studied centers according to having certificate of medical equipment are in improper condition and only 9.13% of studied centers are in proper condition. According to immunity of medical equipment, 3.37% of centers are in suitable condition. 60% of studied centers are in bad condition about condition of repairs and maintaining medical equipment and only 16% of personnel have been necessarily trained about repairs and maintaining medical equipment.

Results indicated that there are meaningful relations between management of maintaining medical equipment and having certificate of medical equipment, condition of repairs and maintaining medical equipment and if the condition of these items be better, management of maintaining medical equipment will be in more proper condition.

DISCUSSION AND CONCLUSION

Nowadays medical equipment are great aids in medical diagnosis, care and education and research for experts, surgeons, doctors, nurses and experts in diagnostic and medical units and annually 5% of costs related to hospitals such as radiology devices, experimental devices, monitors, ventilators, electroshock, electro cautery in or out of the country are assigned to them.

Preventive maintenance plays an important role in management of medical equipment and its requirements will be management of record and documentation of maintenance, creating list of stock related to information bank and system of management in computerized maintaining of medical equipment and certificate of repairs related to medical equipment. Results of this study indicated that maintenance and repairs of medical equipment in studied centers are not properly performed and don't have proper conditions. Different studies focused on maintenance and preventive repair and consider them as facilitating access,

increasing the endurance, longevity, efficiency and reducing future costs of equipment. It seems that lack of expert of medical equipment in staff related to hygienic-medical centers and also low supervision on works of technicians have caused reduction of this factor in management of medical equipment.

Education prepares the main pillar and necessary field for applying management of medical equipment in hygienic centers. This education prepares in three levels of academic training (clinical engineers), training in hygienic-medical centers (operators) and annual continuous education (with intercalate in educational case of engineer, technician and operator). Agusta and Moslemi consider complete education of operators and users by unit of medical engineering for exact and proper performance and optimized usage of device as necessary. Results of this study indicated that training maintenance and repairs of medical equipment are done very weakly and educational courses about management of maintenance of medical equipment are not held in hygienic-medical centers that can be one of the effective factors in low level of management related to maintenance of medical equipment and also increasing financial pressure on hygienic system.

Lack of technician or expert of medical equipment in hygienic-medical centers were another findings of this paper, as only 2 centers of studied centers in the city had expert in medical equipment that none of them had professional and educational certificate about medical equipment. In a study in Latin America, Maxol indicated that numbers of resourceful people for working with technical device of medical, repair and maintenance are low. On the basis of the investigation, 44% of existed medical equipment didn't have even one engineer or medical technician^[6] that is parallel with findings of this research.

CONCLUSION

According to results of study, existence of an expert related to medical centers in staff of hygienic-medical centers in cities for supervision and evaluation of medical equipment and also recording features of equipment seem necessary. Also holding continuous educational meetings are helpful for technicians and experts of medical equipment in increasing management of maintenance related to medical equipment.

This paper is driven from thesis of MA in management of hygienic-medical services in Azad University and Marvdasht branch.

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