

Infections Risks of Medical Buildings: Perspectives Investigation in a Case-study

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ABSTRACT

Each medical building has a significant role in presenting high quality of health services for public, so, attention to medical risks, such as, Hospital Acquired Infections (HAIs) is essential. therefore, this article attempts to describe the HAIs situations of a medical building in the Middle East and mention some medical building's factors which have role in increasing the rate of HAIs risks. The unstructured interviews with experts of the case were conducted. Based on the results, the medical building involves about HAIs like the other medical buildings and some factors, such as, poor personal hygiene can increase the rate of HAIs in the case. Any document like this article can be a useful evidence to nominate health risks, like HAI, in different medical buildings and remark issues which are relevant to decrease the rate of health risks in the other medical buildings. It can help to improve the quality of the health services and can give new ideas to the researchers and practitioners to find solutions in various fields to decline the risks of different medical errors, specially HAIs.

Keywords: *Infection, Medical building, Case study.*

Introduction

In each country, health and setting health care services are one of the significant issues at the primary level of each society strategies ⁽¹⁾. Medical building, likewise it is known as health-care facilities or similarly can be acknowledged as hospitals, are among infrastructures of public health. The goals of each medical buildings can be attained by some doings, such as, patient care, personnel-health education, health related study and health promotion ⁽²⁾. Despite the improvements and innovations in health and medical sciences and health management, health risks are still problems of the medical buildings. Hospital-Acquired-Infection (HAI) is one of those risks that require special attention. HAI or medical buildings cross-infection is a kind of infection wherein a patient becomes infected along his/her hospitalization

or within a few days of his/her discharge ⁽³⁻⁷⁾. The history of HAIs, as one of the main problems and one of the 10 leading causes of death in medical buildings, is back to the many years ago ⁽⁸⁾. HAI is not limited to a special geographical area; it is a universal challenge ⁽¹¹⁾. HAIs extend duration of hospitality, lead to a long-term disability of the patients, increase the patients' resistance to antimicrobials, can cause mortality, rise the financial load of medical buildings and extra costs for the patients and their families ^(9, 10).

Methodology

For this research, a qualitative research method is used, through interview. In this study, viewpoints of the experts of a medical building (hospital) in the Middle East, as a case study, are presented in field of HAI. Additionally, some factors which can increase the rate of these infections risk have been discussed. Twenty therapeutic and diagnostic departments with 400 beds and 1,400 medical staff are belonging to this medical building. Though to some considerations, this article kept the name of the case medical building confidential.

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The goal population for this research is the experts who are related to assessment of HAI risks in the medical building. The researcher, for this study, conducted interviews with experts of the medical building, in 2018. The face to face interviews were conducted. The

researcher used unstructured interview format for this study. List of the medical building's experts with their characteristics is tabulated in Table 1. The expertise of the selected list is validated in a session of discussion with the manager of the selected medical building.

Table 1: List of experts related to assessing HAI risks in the medical building case of Middle East

Expert Code	Position	Duration of professional experience
N1	Infectious disease specialist	7 years
N2	Medical building infection control coordinator	8 years
N3	Infectious disease specialist	5 years
N4	Infectious disease specialist	3 years
N5	Medical building nursing head	11 years
N6	Medical building quality improvement committee coordinator	7 years
N7	Environment health coordinator	6 years

Finding and Discussion

About the situation of the HAIs in the medical building, based on the viewpoints of all experts, HAIs are one of the challenging issue of the medical building. Referring to expert N2, finding the origin of infections of patients is expensive and time-consuming. While in many developed countries the patient after being discharged is followed by a nursing force to complete infection treatment. Lack of this system leads to incomplete treatment and transmission of infection. In some cases, a patient attends the medical building with an intense infection, which causes high expenses to both the patient and the medical building and increases the death rate. This is the case with the medical building where the infection origin is not assessed, with the excuse of insufficient manpower in infection control department.

With respect to the question that how distant the medical building from ideal conditions to control infection is, the experts' answer is that the main problem of the medical building is its construction; the departments are not in standard conditions and no precision is observed as to infection transmission possibility in their construction. According to expert N6, because of the type of medical building's services, there exists the necessity to run several surgeries in the abdominal area, in specific, and many patients suffer breakages and brain hemorrhage; hence, HAI is inevitable

If the infection test is positive, in case the patient is brought to the medical building recently, it is supposed

the patient had the infection before. This holds true for urology patients with a urine infection and internal department patients with blood infection which do not get recorded. Some patients attend the medical building from other therapeutic centers where they get an infection during a surgery process and the infection does not get recorded. Only the medical building patients get recorded if their infection is proved after 24-48 h. But the origin and the reason for this infection is not assessed.

According to experts N1, N2, N3, N4 and N7, the medical building is distant from global standards as to HAI control. For instance, despite the fact that every bed needs one nurse to provide services and control infection, in the medical building one nurse serves 3 beds; hence, the treatment quality is reduced. Due to the heavy workload of the nurse may not observe hygiene conditions, leading to an increase in infection. With respect to the question that is emergency condition announced due to high-risk infection reported in the medical building, the experts expressed their answers. According to expert N6, a case of high meningitis in ICU departments and another of pneumonia caused by ventilators in the medical building were reported, where immediate actions to control were taken. Expert N1 states that in a case the encephalitis rabies (100% fatal) of a patient was to spread in the medical building and increase the death rate, while a crisis condition was announced to control the infection.

According to experts N1, N2, N5, N6 and N7 future strategies of the medical building to control and reduce

HAI constitute increasing supervision and observing personal hygiene by physicians and staff together with enhancing working conscience among personnel. By assessing the expert's opinion, it is revealed the awareness of the medical groups for infection control within the medical building departments, where attempts are made to control and prevent the outbreak of HAIs through applying disinfectants, personnel hygiene, prescribing antibiotics, etc. Despite the made advances, HAIs are still one of the problems in the medical building.

About some factors of the medical building which can increase the risks of HAIs, referring to viewpoint of experts is the medical staff, physicians and medical students of every department who do not observe personal hygiene. According to experts N1, N3 and N4, infection is transmitted due to the training and research purposes of this medical building. The students are moving among the departments without changing their medical gown or observing hand hygiene and other items related to infection control. They enter departments like hematology/oncology, where sensitive patients with the very weak immune system are hospitalized and do not wear a medical gown, change gloves, wash their hands and observe other health items leading to an increase in infection transmission risk. In addition, the medical building physicians move among departments to visit patients and do not observe hand hygiene. For instance, they move from the infectious ICU department to other departments and increase the infection transmission possibility. This holds true for department technicians who move among departments like physiology and radiology. In addition to contact transmission, there exists the airborne infection transmission type of tuberculosis, in specific, based on viewpoint of experts N1 and N6.

Also, transferring of patients among departments can be the other reason of HAIs transmission in the medical building. Referring on experts N1, N2 and N3, due to long hospitalization, open surgeries and the necessity to undergo cerebrospinal fluid cultivation in order to obtain negative infection report, neurology patients have to move among various departments; hence, the possibility of infection transmission. According to experts N1, N2 and N6, at emergency department where hospitalization time is maximum 6 h and then the patients are discharged or transferred into a department corresponding to their diseases, there exists the possibility to transmit the infection to other

departments. Inappropriate venipuncture at emergency department is considered as an infection resource which may transmit into other departments. Experts N1 and N2 state that a patient in the venipuncture discovers to have an infection after undergoing a surgery and being discharged. After running assessments, it is revealed that this patient got the infection during the surgery. In order to receive necessary services, patients may have to return to a previous department and based on the intensity of infection, they may need surgeries and therapeutic services of other departments, which in turn leads to an increase in infection transmission possibility.

Referring to all experts, there exists the possibility of infection transmission among departments. ICU department in the venipuncture is an example. According to experts N1, N2, N3 and N4, ICU department constitute the highest infection rate and is considered the infection resource. This is due to the long hospitalization of patients and the weakening of their immune system due to antibiotics consumption. These patients are prone to bed sore due to long hospitalization which is considered as an infection resource. Based on viewpoint of expert N1, in a case, a patient in ICU department in the venipuncture was suffering difficile diarrhea and another patient in internal department got diarrhea with the positive difficile test. This is an example that difficile infection is transmitted from ICU to the internal department, both patients had a same physician.

According to expert N6, in cases the hospitalization time of patients increases due to HAI, everything related to the patient is affected, expenses, in specific. This is due to the demand for medication, antibiotics in specific, infection consultation and infection visit and in some cases the necessity to undergo surgery, which depends on the infection type. The simpler the infection, the lower the expenses and manpower. In case of acute infections, a patient with osteomyelitis (an infection of the bone) in the medical building underwent 11 surgeries and did not recover. This is an instance of high expenses as to surgery, medication, equipment, and personnel for both the patient and the medical building because of HAIs. If necessary actions are taken to control infection, the suffering and expenses caused by infection may reduce to a considerable extent. According to the expert N6, the type of diseases and the physical structure of the medical building together with the arrangement of departments are contributive in generating and transmitting infection.

Conclusion

To conclude, it can be recognized that the prevention of HAIs is an essential factor for every medical building and government of countries, ^(2,12). Based on the information which achieved through interview sessions with the experts of the medical building, it can be found that the strategies and standards which are relevant to control HAI are not implemented in a sufficient way in that medical building. This issue can be because of some factors, for instance, lack of knowledge of personnel in field of HAI control strategies and it's standards; poor personal hygiene among physicians, nurses, medical students, medical staffs; lack of suitable constructor layout of medical buildings departments; transferring of patients, medical students, physicians, medical staff and technicians among departments and etc. Therefore, if the management and medical group of the medical building pay attention to these factors and try to decrease errors in them, it can help to decline the rate of HAIs in the medical building. These activities can improve the quality health services and reduce the rate of mortality, morbidity and financial load of HAIs in the medical building. Also, referring to the factors which mentioned in above sentences, researchers can work on fields of personal hygiene, medical building's layout as an example of research fields to control and/or prevention risks of HAIs in the medical buildings around the world.

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