

Research Article

The Level of Safety Standards' Observation in the Operating Rooms of Imam Sajjad and Shahid Beheshti Teaching Hospitals of Yasuj

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ABSTRACT

Introduction: Due to the fact that the operating room is the beating heart of every hospital, observing the safety regarding to the physical standards or fire prevention; staff and patient's safety as well as compliance with infection control standards is often considered for the overall assessment required by the hospitals to earn points. Therefore the present research was performed to study the level of Standards' Observation in the Operating Rooms of Imam Sajjad and Shahid Beheshti Teaching Hospitals of Yasuj (2011).

Materials and methods: The present research is a cross-sectional investigation on safety standards conducted in Imam Sajjad and Shahid Beheshti teaching hospitals of Yasuj (2011). The research variables included safety standards; physical space; safety of personnel and patients; equipment; and cleanliness of environment, offices, and clothing of personnel.

Results: The findings obtained in the morning shifts were in 71% of overall compliance with standards and had a better percentage compared to evening and night shifts in hospitals and it was a shift with better safety standards. In the end, standards compliance by both hospitals' staff with an average of 68% , has been relatively safe.

Conclusion: The results of the study indicated that operating Rooms of Imam Sajjad and Shahid Beheshti Teaching Hospitals of Yasuj were in a relatively safe level regarding the overall safety and patient safety compared to the standards. Besides, standards compliance by staff was proved to in an acceptable level. However, in terms of devices and equipment safety as well as infection control was found to be unsafe.

Key words: Safety standards, operating room, Yasuj

INTRODUCTION:

Operating room is considered as one of the main units in the hospital and the most important step in the patient's treatment process. Besides, the observation of its safety standards by the

personnel and patients is of utmost significance due to the physical characteristics of medical gases and the use of different electrical devices. The purpose of observing the safety standards in

the operating room is for both the staff and patient safety in the room in which the surgery is operated. The observation of the safety standards in the operating room is a group task where everyone has a shared responsibility to ensure patients' as well as theirs safety. For that reason, periodic review of safety requirements and matching it, with existing standards is essential as limited economic resources and medical equipment, and space suits require more sensitive practices in service delivery. Due to the fact that the operating room is the beating heart of every hospital, observing the safety concerning the physical standards or fire prevention; staff and patient's safety as well as compliance with infection control standards is often considered for the overall assessment required by the hospitals to earn points (13). The complexity of the issues related to patient, treatment protocols, and the use of high-tech is manifested in the operating room (7). In this regard, there is a need for effective management to accommodate with rapid daily changes to ensure the safety of staff and patients in the operating room.

Nosocomial infections have been the issues of the past century and wound infection after surgery is considered as one the most important side-effects of surgery. Sterilized principles' observation when washing hands, wearing a gown and gloves during and after surgery prevents infection of the surgical site. The surgical team performance, sterilization process of the surgical instruments and operating room ventilation all play a role in surgical wound infection(8). The researches have shown that the highest amount of bacteria in operating rooms result due to the surgical system and their activities (9). While factors and contaminated instruments are considered among the causing factors in the spread of organisms in the hospital environment, human resources are far more effective regarding to the development and transmission of nosocomial infections than the solids (10). In addition Manely (2004) stated that bactericidal effect of UV radiation is undeniable and many operating rooms in Europe use this

radiation (9). A study about the standards of care by Jackson et al. (2004) found that if sterile equipment are stored in the operating room and are not used, they remain sterile up to two weeks(1). The complexity of the issues related to patient, treatment protocols, and the use of high-tech is manifested in the operating room (11).

In the present research, it was attempted to consider all metrics related to health and safety conditions, physical space, equipment and facilities of the operating room. A checklist was designed in this matter for safety estimation in the operating rooms of Imam Sajjad and Shahid Beheshti Teaching Hospitals of Yasuj and solutions were suggested in the end for the observed issues.

Review of the Literature:

In an article titled "A study on the use of infection control principles and procedures in operating rooms of hospitals affiliated to University of Medical Sciences and comparing them with the standards" by Nurian et al (2). (2005), the following results were found:

The performance of the observed staff was poor regarding disinfection and sterilization procedures (93.75%), personal and clothes' hygiene and scrub (79.2%) and patients' hygiene (84%). Moreover, it was proved that facilities and equipment of the operating room are far from standards in terms of infection control practices. It was concluded that there was an urgent necessity to review the physical space, facilities, and equipment in operating rooms beside personnel training in the field of infection control principles while monitoring and precise control over their performance.(12)

In another investigation titled "Evaluation of disinfection and sterilization methods used in the operating rooms in hospitals Malayer" by Futurechi et al (3). (1999) deduced that:

Percentage points of observing in applying disinfection and sterilization methods in terms of physical space, surgical hand scrub, and preparation of the surgical site, metal objects, plastic items, and rest of fabric were 30.18, 56.68,

39.92, 77.96, 40.97, and 70.46 percent, respectively. In addition, overall percentage of the hospitals number 1, 2, and 3 were 54.75, 48.89, and 55.73, accordingly regarding observing disinfection and sterilization methods.

Majidi et al (4). (2006) conducted a study titled "The infection control principles' application by operating room staff in teaching hospitals of Rasht" and reached to the following results:

The performance of Rasht nursing personnel ranging from nurses, operating room technicians, and health care workers in operating rooms was acceptable regarding the principles of infection control (97.9%). Furthermore, most of the surgeons (100%) and a high percentage of the anesthesia personnel consisting of technicians and specialists (61.8%) showed an acceptable performance. The highest percentage of operating rooms and equipment were acceptable in terms of the physical environment and the situation. Principles observation regarding to infection control by personnel in operating rooms in washing hands, dressing, sorting hair, changing shoes, decontamination of surgical instruments, and controls on equipment's sterile date yielded to an satisfactory level.

Yet in another article titled "Review of the safety standards in hospital operating rooms of Tehran University of Medical Sciences" by Mousavi et al(5). (2011) it was proved that university affiliated hospitals were 84.9% safe in terms of overall safety in operating rooms. However, the employees' safety percentages were lower in terms of safety and infection control. Hospital operating rooms of Tehran University of Medical Sciences were safe regarding the physical environment, fire protection, and patient safety; in terms of infection control were in relatively safe ranges, and were unsafe considering the safety of personnel.

Overall, acquiring a score of 97.5 percent in terms of overall compliance with safety in operating room, Tehran Heart Center might be a suitable model for the other hospitals.

Method:

First of all, researchers were introduced to teaching hospitals affiliated with the introduction of the Research Council. Then, sampling was done in operating rooms affiliated with Yasuj Medical-Science University. Data collection tool was a checklist composed of eight parts that was utilized as a standard checklist in the hospitals affiliated with Tehran's Shahid Beheshti University. The checklist consisted of the parts regarding gown and protective coating, control and infection prevention, devices and equipment, avoiding accidents and fire, delivery of the patient to the operating room, patient's privacy, and daily and weekly cleaning of offices and papers. Likert scale (excellent/ very good / good / average/ poor) was utilized for grading. SPSS 16 software was used to analyze the collected descriptive and analytical data.

Data collection process included the completion of the standard checklist by students, staff, and a number of surgeons. This checklist was used as standard for all operating rooms and its reliability and validity was estimated.

The checklist contained 8 sections as follows:

The first part included 4 questions that investigated the participants' gown and cover in the operating room personnel.

The second part consisted of 13 questions relating to the control and prevention of infection by the staff.

The third section contained 14 questions in relation to the machinery and equipment.

The fourth section was composed of 8 questions about avoiding accidents, injuries, and fire.

The fifth section inquired about the delivery of the patient to the operating room.

The sixth section comprised three questions regarding the patient's privacy.

In section 7, there were 9 questions that focused on daily and weekly cleaning.

The eighth section consisted of four questions in connection with papers and offices.

RESULTS

Table 1. The collected data showed that 57.7% of surgeons and 38.5% have been operating room participants were students while 3.8% consisted of personnel.

Table 1. people in the study

Participants	Percent
University student	57.7%
Surgeon	3.8%
Operating room personnel	38.5%
Total	100%

Table 2. The findings also suggested that in Imam Sajjad 67.77% and in Shahid Beheshti Hospital 74.11% of the standards were met.

Table 2. Compliance with the standard in the field protective cover for personnel

Hospitals	Percentage of standards met observation in personal protective coating
Imam Sajjad	67.77%
Shahid Beheshti	74.11%
Total	100%

Table 3. In infection control and prevention section in Imam Sajjad 67.17% and in Shahid Beheshti Hospital 70.12% of the standards were met.

Table 3. Compliance with the standard for control and prevention of infection

Hospitals	Percentage of standards met in infection control and prevention
Imam Sajjad	67.17%
Shahid Beheshti	70.12%
Total	100%

Table 4. Regarding instruments and equipment in Imam Sajjad 56.9% and in Shahid Beheshti Hospital 58.73% of the standards were met.

Table 4. Observe the standard in the field of devices and equipment

Hospitals	Percentage of standards met in instruments and equipment
Imam Sajjad	56.9%
Shahid Beheshti	58.73%
Total	100%

Table 5. In terms of weekly cleaning in Imam Sajjad 57.3% and in Shahid Beheshti Hospital 62.05% of the standards were met.

Table 5. Compliance with the standard for weekly washing

Hospitals	Percentage of standards of weekly cleaning
Imam Sajjad	57.3%
Shahid Beheshti	62.05%
Total	100%

Table 6. In other sections such as delivery of the patient to the operating room, patient's privacy, and offices in Imam Sajjad over 69% and in Shahid Beheshti Hospital 70% of the standards were met.

Table 6. Compliance with the standard in the field of delivery of the patient from the department to the operating room, patient privacy and offices

Hospitals	Percentage of standards met in delivery of the patient to the operating room, patient's privacy, and offices
Imam Sajjad	Over 69%
Shahid Beheshti	70%
Total	100%

Table 7. The results also suggested that the overall safety in the two hospitals had an average of $69\pm 7.49\%$ compared to international standards.

Table 7. Observing overall safety against international standards

Hospitals	Percentage of safety with respect to international standards
Imam Sajjad and shahid beheshti	$69\pm 7.49\%$

Besides, in terms of safety equipment both hospitals had an average of $57\pm 7.69\%$. As regards safety standards of the patients, both hospitals had a mean of $73.3\pm 8.88\%$. Considering infection control standards, 56% of the standards were met in both hospitals while instruments and equipment with the mean of 57 ± 7.69 were proved to be below average. Moreover, regarding the compliance with infection control, the hospitals were below standards with 56%.

However on the subject of patient safety standards, the samples were proved to be relatively safe with a mean of $73.3\pm 8.88\%$. The results obtained in the morning shifts were in 71% of overall compliance with standards and had a better percentage compared to evening and night shifts in hospitals and it was a shift with better safety standards. In the end, standards compliance by both hospitals' staff, with an average of 68%, was proved to be relatively safe.

DISCUSSION AND CONCLUSION:

Safety and infection issues have always been a major problem in medicine and this is not something to occur recently. The reason why it has been under the spotlight these years is the fact that there is much research conducted in this field. The studies have shown that despite the anti-microbial materials and compliance with safety standards, and using new sterilizing equipment, the spread of infection in hospitals is still at a high level. Operating rooms' structure shall be designed in a way that it prevents infection spread to the surgical site and also other parts of the hospital. Operating rooms must be located in a part of the hospital away from noise with a calm and peaceful area around it. The operating rooms should not be located in the packed areas of the hospital with a

fast air flow. Moreover, these days it is attempted to locate the operating rooms in the lower floors of the hospital equipped with a separate ventilation system so that patients are transferred there quickly and without difficulty.

The results found in this article showed that the performance of both the hospitals' staff regarding clothing and gown, with a mean percentage of 55.94%, were consistent with Nurian et al. (2005) in Shahr-e Kord's teaching hospitals with a mean of 79.2%.

Regarding infections' prevention and control the mean obtained was 56% in both hospitals that was in an average level compared to Majidi et al. (2006) investigation in Rasht teaching hospitals with the mean of 86.5%. Besides, Nurian et. Al (2005) article in Shahr-e Kord's teaching hospitals obtained a mean of 93.75%.

In terms of instruments and equipment, both the hospitals in the study had a mean percentage of 57.31% which was again in an average level in comparison with Majidi et al. (2006) article with a mean of 83.3%.

In the present study, the mean for physical standard and cleaning was 59.54% that is again in an average level compared with Mousavi et al. (2011) research in Tehran science-medical universities with the mean percentage of 83.3%. Furthermore, regarding the patient's delivery to the operating room, this study obtained the percentage of 67.5 while Mousavi et al (6). (2011) were in a higher percentage with 94.4%.

Based on the results of the in-hand investigation presented in Table 8, it is concluded that the overall safety in the two teaching hospitals affiliated to medical-science universities of Yasuj with the mean of $69\pm 7.49\%$ is relatively safe compared to international standards.

Table 8. Overall safety in both Yasuj medical education hospitals

Hospitals	Percentage of safety in both Yasuj medical education hospitals
Imam Sajjad and shahid beheshti	69±7.49%

Finally, with regard to the results and due to the fact that the responsibility of the safety of patients and staff is very important, it must be considered as a priority for the hospital officials and necessary measures are adopted in terms of physical conditions, facilities and equipment among others.

Besides, it is suggested that university and hospital officials plan particularly for safety training courses related to the operating room for staff at different levels in university hospitals. In addition, the officials must seriously follow the creation of levels of control and management. Therefore, taking measures such as training needs assessment and use it to organize courses and workshops; recovery in infection control related to the operating room according to new findings of scientific research; continuous revision of safety control programs in hospitals, operating rooms and repairing them, infection control procedures in operating room by staff, patients and practitioners; the estimation of the costs resulting from non-compliance with the required safety standards in the operating room; and more active safety committees and control of nosocomial infections regarding the issue of safety for patient satisfaction are all significantly useful and might be better to be considered by the hospital authorities.

Suggestions:

The researchers of the field might find it useful to investigate on the following matters:

1. Study more on different aspects of the field of standards and explore its effects on other areas
2. Conduct this study at different age levels and compare its results with the present article

Limitations:

1. Lack of sufficient time and financial resources
2. Lack of foreign primary sources and studies in the field
3. Executive limitations and reluctance of the staff to answer due to the length of the test
4. Lack of time to gather more information
5. Lack of cooperation of many hospital staff

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