

# THE ACCREDITATION OF HUMAN RESOURCES AND PHYSICAL SPACE OF THE IRANIAN HEART CENTRE: COMPARISON TO THE NATIONAL AND INTERNATIONAL STANDARDS

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## ABSTRACT

### OBJECTIVE:

Standardization of hospital resources and physical space can be an important strategy to increase productivity and effectiveness of services. The study was conducted with the aim of comparative accreditation of human resources and physical space in Mazandaran heart centre compared with the standards.

### METHOD:

This comparative descriptive study was carried out in Sari city (centre of Mazandaran province) during 2016-2017. The data collection tool consists of two checklists for investigating the physical space and human resources of the hospital. To evaluate the quality of the content, a checklist was distributed to 5 experts from Mazandaran University of Medical Sciences. After corrections the checklist was applied. Data were analyzed by SPSS software version 16 and descriptive statistics.

### FINDINGS:

The total number of nurses in this hospital was 288 and the total number of beds was 171. The human resources in the nursing, nutrition, operating room, anaesthesia departments were not standard. The ratio of total human resource to the number of beds was also estimated as 4.04. Results showed that the physical conditions in the hospital were moderately standard. The physical conditions of the hospital in most dimensions based on checklist, except the

physical location of hospital and the features of its doors, were in accordance with the standard requirements.

### CONCLUSION:

Considering the inappropriate distribution of human resource in the hospital and the non-standard design of physical space for providing services with better quality and increasing patients' satisfaction, it is recommended that experts control more carefully standard requirements.

### KEYWORDS

hospital, physical condition, human resources, standards, Iran

## INTRODUCTION

In most countries, hospitals are the most important medical institutions [1], such that among different components of health system, hospital services are the main factors in the growth of costs. [2] Human resources, as an important strategic factor, have also played a significant role in the productivity of health care organizations. [3] Based on the results of a study in 2009, 48% of the total hospital budgets were accounted for staffing costs. [4] This refers to the undeniable importance of hospital human resource and its significant role in hospital costs. [2] On the other hand, human resources employed in organizations should be

regarded as a kind of capital, since the supply of human resources with specialized capabilities is not readily possible. [5] Therefore, shortcomings and surpluses of human resources have a significant effect on the quality of services to patients. [6, 7] The studies conducted by Shams [8] and Aazami [9] in Iran and Ritu [10] in India showed that there were insufficient human resources in related centres. However, the research of Davari [11] showed that the human resource of the anaesthesia department was desirable in Hazrat Rasool Hospital in Iran which had a different result with previous research. Bahrami Naraki [12] studied human resources of healthcare centres. They reported human resources more than standard requirements. Therefore, because of the importance of this matter and the different results had led us to examine the human resources available at the hospital.

The standard design and construction of physical space is another one of the important factor in improving the quality of care services. The standards vary in different societies based on socio-cultural, climatic, healthy conditions and social security. [13] When standards are well implemented in the design of health centres, good facilities will be provided for patients. [14, 15] Standards have a valuable role in demonstrating the least desirable and expected performance, targeting and determining the current state of the hospital, educational programs, evaluating, monitoring and directing the organization's activities. [16-18] The reports suggest that hospital standards of the ministry of health and treatment in Iran are not adequate and comprehensive due to inefficiency in presentation of weaknesses and shortcomings. [19, 20] Reviewing the researches that were done on the physical space of the hospitals [19, 13, 18] showed that these studies evaluated only certain parts of the hospitals. To provide high quality services and increase the satisfaction of patients, the first step is to identify the strengths and weaknesses. This is possible by evaluating and comparing existing standards. [21]

Reviewing available databases showed that there were few articles published on the evaluation and standardization of healthcare centres, especially in Iran. Therefore, the present study was conducted with the aim of comparative accreditation of human resources and physical space in the Mazandaran heart centre in comparison with the standards in 2016-2017.

## METHODS

This comparative descriptive study evaluated the human resources and physical space of Fatemeh Zahra Hospital affiliated with Mazandaran University of Medical Sciences (Sari, Iran) and compared them with the standards in 2016-2017. Fatemeh Zahra Hospital (Mazandaran heart centre) is a 171-bed educational hospital including CCU, ICU, Heart Surgery, CICU, Dialysis, Emergency, Post CCU, Angiography and Operating Room. The students in general medicine, cardiology and surgery residencies, internship, clinical pharmacology, nursing and paramedical students are being trained in this educational hospital.

### DATA COLLECTION TOOL

The data collection tool was comprised of two researcher-made checklists, a checklist for studying physical space of the hospital and a checklist for studying human resources of the hospital. Several sources [21-24] were used in the design of the checklist and the extraction of standards. The checklist was presented to 5 expert faculty members in Mazandaran University of Medical Sciences to evaluate the content validity. Checklist items in the dimension of human resources were assessment of nursing, physiotherapy (physiotherapist, physiotherapy technician and clerical staff), laboratory (laboratory specialist, laboratory expert, laboratory technician, and clerical staff); radiology (radiologist, radiology expert, radiology technician, clerical staff), technician of operating room, anaesthesia technician, nutritionist, finance, administrative affairs, services and pharmacy (pharmacist, pharmaceutical expert and technician of pharmaceutical affairs) relative to the number of beds in the hospital. Dimension of hospital physical space assessment also had 22 phrases: hospital location (5 phrases), land size (1 phrase), doors' status (3 phrases), corridors' status (4 phrases), staircases' status (2 phrases), elevators' status (2 phrases) and bed size (5 phrases). Each of the items is measured to check the physical condition as follows: 0 = non-standard (noncompliance with standards), 1 = relatively standard (relative compliance with standards), 2 = completely standard (complete compliance with standards). Total scores vary from 0 to 44. Scores are classified into 4 groups: (0-11), (12-22), (23-33), and (34-44). Therefore, the compliance of existing conditions with the standards is placed in poor, good, moderate and excellent levels based on obtained scores.

## ETHICAL CONSIDERATIONS

About 31 ethical codes that approved by research and technology assistance of Mazandaran University of Medical Sciences have been observed in present study [ethic code: IR.MAZUMS.REC.94.2043]. The data was collected after providing the necessary explanations about the research objectives and taking permission from the authorities of the research & technology assistance of the university and the hospital. Also, the present study has attempted to avoid any prejudgment in the conclusions of the study by correct reflection of the information.

## DATA ANALYSIS

Data was extracted from the checklist using SPSS software version 16 and descriptive statistics (frequency, mean, standard deviation, median, and mode).

## RESULTS

Based on obtained results, the total number of nurses in this hospital was 288 and the total number of beds was 171. Table 1 lists the available number of nurses and beds and their standard numbers in each department (table 1).

TABLE 1. THE NUMBER OF AVAILABLE NURSES AND BEDS IN DEPARTMENTS OF HEART HOSPITAL

NAME OF WARD	NUMBER OF NURSES	NUMBER OF BEDS	THE STANDARD NUMBER OF NURSES RELATIVE TO BEDS
CCU1	12	10	16 people per 5 beds
CCU2	14	9	16 people per 5 beds
CCU3	14	9	16 people per 5 beds
CCU4	12	9	16 people per 5 beds
CCU5	12	6	16 people per 5 beds
CCU6	14	13	16 people per 5 beds
CCU7	12	9	16 people per 5 beds
CCU8	14	13	16 people per 5 beds
ICU1	25	8	16 people per 5 beds
ICU2	22	9	16 people per 5 beds
CICU	17	8	16 people per 5 beds
Post CCU	16	20	16 people per 24 beds
Heart A	13	19	16 people per 24 beds
Emergency	28	14	32 people per 10 beds
Operating room for open heart surgery	15	3	38 people per 12 beds
Dialysis	22	10	38 people per 12 beds
Angiographic operating room	26	2	38 people per 12 beds
Total	288	171	420

Also, based on results, the number of human resources employed in physiotherapy was 4, 12 in laboratory, 8 in radiology, 16 in technician of the operating room, 14 in anaesthesia technician, 1 in nutrition, 25 in financial affairs, 34 in administrative affairs, 95 in services and 8 in pharmacy. The statistics of the human resources employed at the hospital based on their employment type were as follows: formal staffs: 201, committed staffs: 97, conventional staffs: 155, staffs who have to work obligatorily for two years: 57, non-formal nurse (corporate): 53, service staffs (corporate): 90, assignment staffs (typing & printing, laundry, facilities, vehicles and kitchen): 38 and the total number of personnel is 691 people. The ratio of total human resource to the number of beds was also estimated as 4.04.

By comparing hospital location with existing standards, the hospital was not fully compliant with the standard requirements, but the hospital land size was completely compliant with standards. Details are given in Table 2.

The total score obtained in the physical assessment checklist showed that the physical conditions in the hospital were moderately compliant with standard. Based on the results, the physical condition of the hospital is relatively standard in most aspects except for the physical location and the characteristics of doors. Table 3 shows other details of physical condition of Fatemeh Zahra Hospital in Sari

**TABLE 2: HOLISTIC EVALUATION OF PHYSICAL SPACE OF HEART CENTRE**

THE STUDIED FEATURES	STATUS QUO	STANDARD
Hospital location	Relative compliance	Adequate space
	Relative compliance	Calm space
	Noncompliance	Surrounding areas
	Noncompliance	A location for helicopter
	Noncompliance	Separate streets that are available for doctors, patients and employees
Land area	Complete compliance (780 m <sup>2</sup> )	42 m <sup>2</sup> per bed

## DISCUSSION

The present study compared the human resources and physical space of the Mazandaran Heart Centre educational hospital with the standards. The present results on standard compliance showed that the number of nurses relative to the number of beds in CCU, ICU, emergency and dialysis units was lower than the standard requirements. [22] Also, the standard number of human resources is estimated in following departments: laboratories: 12 people, physiotherapy: 3 people, radiology: 8 people, nutrition: 2 people, surgical technicians per active operating room: 10 persons, the technicians and expert anaesthesia personnel per active operating room: 11 people, pharmacy: 6 people [23], financial affairs: 25 people, administrative affairs: 34 people, and services: 26 people. [24] Based on present results, the number of human resources in laboratory, radiology and administrative affairs in Fatemeh Zahra Hospital was compliant with standard. On the other hand,

human resources in the financial affairs, pharmacy, physiotherapy and services were higher than the standards, whereas the human resources in the nutrition, the operating room and anesthesia departments were lower than the standard. The results of a study on hospitals affiliated with Tehran University of Medical Sciences (University Type 1 in ranking) showed that the distribution of human resources was inappropriate in nursing, support and paramedical units. [3] Neyasi et al also stated that most of the hospitals' departments lacked human resources in different wards, especially nursing staff and para-clinical wards. [23] Researchers in another research with result analysis found that the hospital's emergency department faced shortages of nurses, especially in night shifts. [25] Matsumoto et al. noticed the inappropriate distribution of human resources in the health care sectors in Japan, the United States and the United Kingdom. [26] Also, according to research results in China, it was found that there was an inappropriate distribution of human resources, especially

**TABLE 3: DETAILS OF PHYSICAL CONDITION OF HEART CENTRE**

VARIABLE	STUDIED FEATURES	EXISTING DATA	STANDARD (24)
Doors	Size of entrance doors of vehicles	3.5* 2.5 m	1.26-1.37* 2.13 m
	Size of corridor doors	2.40* 2.30 m	2.40* 2.40 m
	Health doors of hospitals	Noncompliance	Protected against fire and infection
Corridors	Usual corridors	2.25 m	1.5 m wide
	Corridors of hospitalized patients	2.10 m	1.26-2.13 m
	Main corridor	3.25 m	3 m
	Corridor of operating room	3.10 m	2.25
	Staircases	Relative compliance	Both sides should be railed
Stairs	Size of stairs	Complete compliance	Emergency stairs should not be spiral
		2 m	The emergency staircases should be 1.50- 2.50 m wide
		15 cm	The height of stairs should be 17 cm
Elevators	Size of elevator	Relative compliance	120 * 90 cm
	The number and features of elevators	Complete compliance	An elevator for beds, patients, visitors per 100 beds
		Relative compliance	Two small elevators for equipment and staff
		Relative compliance	The elevators of wastes should be separated
		Relative compliance	The elevator should be big enough for a bed and two companions
		Complete compliance	Flat surfaces should be washable
Bed size	Bed length	2m	2 m
	Bed width	95 cm	90 cm
	Bed height	60 cm	65 cm
	The head of bed against wall	0 cm	10 cm
	The distance between the end of two beds	60 cm	20 cm

nurses and doctors. [27] A study reported that the ratio of employed human resources to the active bed in all studied hospitals of Iran in 2015 was equal to 1.7, which corresponds to the health ministry's standard. [6] The total ratio of human resources to the number of beds in studied hospitals was higher than the standard requirements in the present study. But it seems that the distribution of human resources in some departments, especially nursing, has not been done fairly. The reasons for the different results of the studies are the different financial resources allocated for employing human resources, the amount of attention paid to human resources and the welfare and therapeutic conditions of patients in different regions.

The results of this study on compliance of physical status of Fatemeh Zahra hospital with standard requirements showed that the hospital had a relatively appropriate condition in terms of adequate and calm spaces and land area, whereas it did not comply the standards in terms of surrounding areas and lack of location for helicopter. In the design of the dimensions of the entrance doors of the vehicles and corridors, standard requirements were observed, but it should be noted that the hospital doors were not protected against fire and they did not have resistant surface coating against infection. The ordinary corridors, the main corridor, the corridor of the operating room, and the corridor of hospitalized patients were relatively standard. The staircases were also standard, although the height of stairs was lower than standard. The features and dimensions of elevators were nearly appropriate, so that the flat surfaces were washable, but their numbers were not proper. Results of the beds' size showed that the beds were relatively standard in terms of length, width, and height, whereas the position of the head of the bed against the wall as well as the distance between end of two beds were not standard. [28] Keyvanara et al studied the physical condition of hospitals and reported that Isfahan Hospital was in good condition in terms of the physical space of the paediatric ward. [13] Also, the results of a study showed that physical condition and the view and proportionality of public wards and emergency department were fairly acceptable in public and private hospitals. [14] Another study indicated that most of the emergency departments of the educational hospitals of Tehran University of Medical Sciences were in desirable condition in terms of space, activity and facilities. [1] In present study the emergency department of Fatemeh Zahra Hospital was also relatively standard in terms of space, facilities and physical conditions. Since climate

conditions, location, constructional materials, and paying attention to health-treatment facilities play a significant role in the design of physical space and hospital structure, these factors may be possible reasons for different results of the studies.

## LIMITATIONS

Ignoring the physical report of each of the hospital departments, due to the increase in the volume of the paper and the unavailability of an international standard instrument, are limitations of the present study that can be effective in generalizability of results. Another limitation of this research is the non-generalizability of the conclusion to all hospitals, in other words it can be used for comparison with the same type of hospitals with the hospital in our study. Therefore, further studies should be carried out on specialized hospitals in other regions of Iran, and the existing conditions of hospitals are compared with international standard instruments.

## CONCLUSION

It seems that it is the first study published in the Middle East that examines the status of a heart centre hospital. According to results, the human resources in laboratory, radiology and administrative affairs were standard in heart centre hospital. Also, the number of human resources available in financial affairs, pharmacy, physiotherapy and services was higher than the standard; whereas human resources in nursing, nutrition, operating rooms, anaesthesia were lower than standard. Also, the results showed that the physical conditions in the hospital were moderately standard. Therefore, considering the importance of human resource management in hospitals and the physical conditions of health facilities for providing better quality services, it is recommended that the standards be monitored carefully by experts and the authorities. Also, the results of this study can be used for hospital and university officials to reach the standards level and increase the efficiency and quality of health care services.

## COMPETING INTERESTS

The authors have no other relevant affiliations or financial involvement with any organization or entity with a financial interest in or financial conflict with the subject matter or materials discussed in the manuscript. This includes employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties.



## ACKNOWLEDGEMENTS

We would like to thank Mazandaran University of Medical Sciences, Sari-Iran, for its support and those participants in this study who carefully responded to our research questionnaire.

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