

# Estimation of the Necessary Nursing Manpower in Selected Hospital Affiliated with Jundishapur University of Medical Sciences

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## Abstract

**Introduction:** Nursing Manpower plays a key role in the quality of care and health promotion. So considering efficient and qualified nursing units is necessary for any health care organization without which they can't survive long. This study was aimed to estimate the Nursing Manpower required by the Imam Khomeini and Razi Hospitals affiliated with Jundishapur University of Medical Sciences in Accordance with Standards of the Ministry of Health.

**Methods and Materials:** This research is a cross sectional study which was accomplished in the Selected Hospitals of Jundishapur University of Medical Sciences (Imam Khomeini and Razi Hospitals) in 2009. For data gathering, data collection forms, referring to different wards of the mentioned hospital and the medicine assistance office of Jundishapur University was used.

**Results:** Based on Findings, from all the 19 wards of Imam Khomeini Hospital, 17 wards had nursing staff less than the standard level. In Razi hospital also, from the total of 9 wards, 8 wards faced with a shortage of nurses. Also, the number of nurses in Imam Khomeini in one ward and in Razi hospital in two wards were 8 nursing Manpower more than proposed standard. Overly, the Imam Khomeini and Razi Hospitals had respectively 193 and 46 nursing Manpower less than proposed standard.

**Conclusions:** According to there sults, status of the number and composition of nurse Manpower in the studied hospitals are far from proposed standard. In order to maintain and improve the quality of provided services in hospitals, Properly informing on the number of required nursing Manpower and providing nursing Manpower accordingly, is a basic and primary step for efficient and effective planning.

**Keywords:** Nursing man powers, Standard, Ahvaz.

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## Introduction

Not so long ago, the term Manpower was used for employees in the organization, but today the 'human resources' term is used for these people; because these workers are skilled and educated people who dedicate their professional knowledge for pushing other resources of organization to produce goods or provide the service (1). So human resources working in the organizations should be considered as an investment and be given more attention, because tools and machinery can always be prepared, but providing human resources with specialized capabilities are often not easy (2). In fact, human resources is considered as the most important factor of development in every country and organization, and also one of the basic components of health care services (3, 4). In Health organizations, especially hospitals, the human resources have more importance. In fact, by the effective efforts of the Health organizations, health of other organizations' employees can be guaranteed (5). In the health ward, the human resources is taken into account as the most important resource and capital and its shortages and surpluses can be effective in reducing the quality of service providing for patients (6). The purpose of human resource planning in the health system is to have a sufficient number of skilled manpower in all required fields which are distributed properly in terms of geographical, sexual and organizational conditions. Any flaws in the planning process, the imbalance between supply and demand will lead to deficiency or excess (7). However, according to the World Health Organization, emphasis on cost reduction in the health sector, giving attention to the hospital's human resources, will reduce hospital admission time and stay period, will reduce hospital costs and improve efficiency (8). Most of the problems in hospitals are due to lack of manpower or its inappropriate distribution. An important part of Human resources of hospitals are nurses. Nursing productivity

has extraordinary significance, because nurses play essential role in promoting health care quality and form great source of work (62% of all hospital staff and 36 percent of hospital costs). Nurses group productivity more than every other group has impacts on improvement and the overall productivity of hospitals (9). So, in order to create the proper functions in hospitals, it is essential to plan organization and labor standards for different types of hospitals based on proper criteria and indicators (government, non-government, education and non-education), so that the hospitals improve their performance by using these standards and experienced managers and using appropriate human resources. One of the new models of estimating human resources for a hospital ward is the health ministry proposed model which is presented in the project of "structural allocation of hospital services during the Fourth Five-Year Plan 1386-1393". It seems that this model compared to previous manpower standards of the Ministry of Health has more accurate estimates about manpower, according to the timing and working measurement of various services in the hospital's wards. The attitude of determining human resources in this model is based on timing and the ability of setting the service shift in any part of the hospital. In this kind of attitude, it is tried to calculate independently the human resource for each ward in the hospital, such as Hospitalization - lab ward, clinical and support ward and other related sectors such as the operating room. So in this type of approach, the obtained index can be specific for each hospital. In other words, a hospital's index is changeable, depending on the type of bed, its occupation coefficient, the number of beds, physical space of hospital and etc. For example, it is possible that one of the two hospitals that has 100 beds and another 500 beds, face with different index of human resources to the bed, or even two hospitals with 100

beds, that have different combination and type of bed, will meet different coefficients in determining index. This type of approach rather than generalizing a top-down fixed index (i.e. choosing a state fixed index like 1.73 for the bed and extending to all hospitals) is trying to extend the index from the bottom to up. In other words, the state index obtained from the sum of the environmental indicators (10). In this regard, this study has been carried out to determine the status of nursing manpower required by studied hospitals according to the proposed model. The results of this project can specify any surpluses and shortages of personnel in various sectors, and meanwhile concentrate the hospital administrators on evidence-based efforts to compensate the personnel deficiencies in various ways, including the reorganization of the human resources, reviewing the job description, using the multiple personnel staff, recruiting the trained staff and etc.

### **Methods and Materials**

This study is a descriptive cross-sectional study that was carried out in Imam Khomeini and Razi teaching hospitals affiliated to the Jundishapur University of Medical Sciences in 1389. The population in this study consisted of clinical and emergency ward of the hospitals in which the nursing personnel are employed in (28 wards). Data was gathered through special forms designed due to previous studies and the comments of the faculty advisor. In this study, three types of data forms were used as follows:

Form No. 1 was related to the clinical staff, which, the position of human resources in the ward was determined through it. Form No. 2 was related to the Medical Records that was used to determine the BOR in the ward, the number of active beds and the average stay for patients in clinical sectors. Form (3) was designed to assess the condition of human resource and personnel structure of the hospital and was completed by hospitals' Clerk Officer. After

collecting the needed data, due to the personnel standards of Ministry of Health and Medical Education, manpower shortages and surpluses were studied in different hospitals. Then according to the distribution of human resources due to the health ministry standards, it was determined that the shortages and surpluses of manpower is related to which one of the job sequences, that it was determined independently for each hospital. Data were analyzed using Excel; descriptive statistics indices and personnel standards guide of the Ministry of Health and Medical Education.

### **Results**

Imam Khomeini Teaching Hospital has 500 active beds and 25 wards with an average occupancy of 78% and an average patient stay of 4 days. The hospital has 710 approved organizational positions which 408 posts have been occupied and 302 posts are vacant. The total number of the hospital staff except doctors is 1069 people, of which 314 cases were official, 164 people were contractual, 138 projective, 211 were Contractual workers, 17 people purchasing the service and 225 people were associational staffs. Razi teaching hospital has 200 active beds, and 9 wards, which the average rate of bed occupancy and the average stay of the patients were 80% and 3 days respectively. The hospital has 325 approved organizational posts, of which only 207 organizational positions is occupied and 118 posts remained vacant. The total number of the hospital's manpower is 436 people (except physicians) that 110 people were official staff, 88 people were contractual, 69 people were projective, 104 people were Contractual workers, 2 people purchasing the service and 63 people were associational staffs. The situation of distributing the nurses group in studied hospitals is shown in Table One. Most nurses in both hospitals were in emergency wards that in Imam and Razi Hospitals were 77 and 27 staff, respectively. Due to

the proposed standard by Ministry of Health, both Imam Khomeini and Razi hospital had respectively 193 and 46 nursing and one clerk; but both of them were excluded from having the director deputy of nursing. In terms of Clinical Supervisor, Imam Khomeini hospital had one and Razi hospital had two nurses, which were 7 and 2 less than the standard rate (Table 2). From all the 19 wards of Imam Khomeini Hospital, 17 wards had nursing staff less than the standard level. In Razi hospital also, from the total of 9 wards, 8 wards faced with a shortage of nurses. Also, a nurse was more than

standard in the emergency ward of Razi hospital, and in the dialysis 12 people and CCU 1 wards of Imam Khomeini Hospital, nurses had been set more than the standard. From 17 wards of Imam Khomeini, 5 wards had between 1-5 people less than standard, 4 wards between 6-10 people, 4 wards between 11-15 people, and 4 wards needed more than 15 personnel to reach the standard threshold of Ministry of Health. In Razi hospital from all 8 wards that didn't have adequate personnel, 3 wards needed between 1-5 people and also 5 wards needed between 6-10 nursing staff (Table 3).

**Table1: Distribution of nurses in the hospital and its distance with the standards**

Hospital	ward	Number of beds	Bed occupancy rate	Ward coefficient	Existing personal status					Personnel in accordance with the proposed model		required Personnel
					Nurse	Nurse aid	Nurse aid Assist	Secretary	Nurse	Nurse aid	Secretary	
RAZI	Neonatal unit	9	96%	1.17	6	2	-	1	6	4	1	2
	Infectious	24	90%	.78	10	-	4	1	11	7	1	4
	Internal	30	78%	.78	12	-	4	1	14	9	1	7
	Surgery	24	68%	.88	9	2	4	1	13	8	1	6
	Males` Orthopedic	24	71%	.88	9	1	3	1	13	8	1	8
	Female orthopedic	17	67%	.88	9	-	1	-	9	6	1	6
	Emergency	16	-	1.56	15	4	3	5	14	11	1	-1
	CCU	10	76%	1.76	10	-	4	1	11	7	1	4
	ICU	8	95%	3.13	12	-	4	1	15	10	1	9
	total	162	-	-	92	9	27	12	106	70	9	46
Emam Khomeini	Emergency	60	-	1.56	36	9	28	4	56	35	1	15
	Ophthalmology ward	46	75%	.88	6	5	5	2	24	16	1	23
	Jaw Surgery	15	-	1.56	4	3	2	1	14	9	1	14
	Neonatal unit	20	96%	1.17	7	3	3	1	14	9	1	10
	Pediatrics Surgery	19	74%	.88	6	5	4	1	10	7	1	2
	Urology	26	67%	.88	7	3	3	1	15	8	1	10
	General surgery	40	79%	.88	12	2	5	1	21	14	1	16
	Nephrology	25	91%	.88	10	2	5	1	15	7	1	5
	Orthopedics	49	71%	.88	10	1	5	1	24	17	1	25
	Cardiac Surgery	16	59%	.88	8	-	4	1	9	5	1	2
	Dialysis	22	-	.22	10	2	4	1	3	2	1	-12

Gastroenterology	25	82%	.88	8	1	5	1	14	8	1	8
Surgery ICU	12	94%	3.13	15	1	7	1	23	15	1	15
Internal ICU	9	97%	3.13	13	-	6	1	16	12	1	9
Cardiac ICU	12	61%	3.13	15	-	-	1	23	15	1	23
CCU 1	12	87%	1.76	16	1	6	1	13	8	1	-2
CCU 2	9	90%	1.76	9	1	4	1	9	7	1	2
CCU 3	9	91%	1.76	10	-	4	1	9	7	1	2
NICU	9	99%	3.13	13	3	-	1	16	12	1	12
total	435	-	-	215	42	100	23	328	213	19	193

**Table2: The distribution of personnel in the Nursing Office Ward of the studied hospitals**

Hospital	The current status		Personnel standards		Distance with standard	
	Razi	Imam Khomeini	Razi	Imam Khomeini	Razi	Imam Khomeini
Director of Nursing	1	1	1	1	-	-
Deputy Director of Nursing	-	-	1	1	1	1
Educational Supervisor	1	1	1	1	-	-
Clinical Supervisor	2	1	4	8	2	7
Infection Control Supervisor	1	1	1	1	-	-
Secretary	1	1	1	1	-	-
total	6	5	9	13	3	8

**Table 3: summarization of the ward swith fewer personnel than the proposed standards**

Hospital		
Imam Khomeini		Razi
There quired manpower	Number of wards	Number of wards
1-5	5	3
6-10	4	5
11-15	4	-
More than 15	4	-
Total	17	8

## Discussion

Providing sufficient resources is definitely One of the major problems of the hospitals today. Supplying staff is an orderly and logical process which aims to determine the number and composition of the human resources required for providing standard Health Care in the health organization (11). Providing proper health care with high quality and productivity at work requires a sufficient number of nursing staff and trained technicians. Several studies have noted the nursing shortage as an obstacle of efficiency and quality of hospital care

(9, 12). One of the wards that the nurses have an important role in the management of that ward is the intensive care unit. One of the main characteristics of the ICU staff is the strong knowledge and scientific background, and nurses who are not qualified in terms of scientific field should not be employed in these wards (13). In the ICU and NICU of the hospitals, severe shortage of nursing personnel can be seen who provide specific health care in a specific situation. Emergency ward is as

the heart of hospital and a regular turnover of these units which can save many lives. Any hospital without an active emergency and proper performance cannot be considered as an ideal health center, and in case of a shortage of manpower in this ward, other hospital services are affected by the failure (3). Also, the quality of health care in the emergency ward is very important in the formal evaluation of the hospital, and evaluation of other wards depends on gaining a quorum point in the emergency ward of the hospital (14). Therefore, efficient and experienced personnel should be appointed to work in the emergency ward and give priority to actions in saving the lives of patients in the shortest time (15). Rahmani and colleagues at Tehran University of Medical Sciences achieved these results in a research which showed that the majority of emergency wards in the mentioned hospitals in terms of management, operations, space, facilities and equipment are in good condition but in terms of staffing, training processes and procedures are in unfavorable condition (16). Also the global study in Babol University of Medical Sciences showed that the emergency wards were all faced with a shortage of manpower (17). So it should be noted that the hospital's emergency ward, as a key part of the hospital, must be developed and balanced with other sectors. According to the studies conducted in Beheshti University, it is better to show the impact of bed occupancy on the number of staff needed in Inpatient wards such as that for the wards with the BOR of 70 percent, in order to estimate the required manpower, the coefficients multiplied by the number of beds and then the result multiplied by the BOR. If the bed occupancy rate is above 70%, the number of required Manpower is calculated from multiplying the ward coefficients with the number of beds and bed occupation has no impact on the increase or decrease of required manpower (18). In this case, estimating the number of additional manpower is

prevented. This status is true in female orthopedic and surgery ward in Razi Hospital and also in Urology, cardiac surgery and cardiac ICU wards of Imam Khomeini hospital. In a survey conducted, the numbers of Organizational dislocation of the Nurses were determined 10 people in Imam Khomeini hospital and 6 people in Razi hospital. Given the critical importance of skilled and experienced manpower in organizational affairs especially in the health sector, it is very important to match staffs (employed) with their current jobs, because otherwise will have irreparable damage for Hospital and its customers (patients) that it could be observed in reducing client satisfaction, increasing medical errors and decreasing quality of health care. This imagination that prohibiting employment will lead to outsourcing is a chimera and totally unrealistic. In fact prohibition of employment means escaping from functional responsibilities in the public or in the private sector. Since the beds require manpower for providing service. Staff needs should be done through the organization itself or through outsourcing. In each of these situations, whether providing staff is conducted through the organization itself or through contracts with the considered outside firms, consider the efficiency and effectiveness of services must be Experiences in recent years in reducing manpower by forecasting 1.7 personnel for each bed, though apparently led to the miniaturization, but maybe led to the removal of some necessary services, without properly miniaturizing the high and middle level of organization and reducing bureaucracy. According to the study of Sadaghiani (1385) about reducing the human resources of hospitals, a dangerous event has occurred. Because of the impracticability of service providing with 1.7 staff, hospital administration itself have attempted to eliminate some of the hospital beds, which its concept is the differences between active bed and real capacity of hospital beds. The results of

this action were reduction of potentials and thus the "Service Removing" at least 30%, rather outsourcing. In the country's hospitals and especially hospitals that the beds` capacity in hospitals are not used properly and average bed occupancy rate (BOR) are low, hospital management use less human resources and sometimes inappropriate arrangements that has entered an irreparable harm to the body of the hospital system and many of the features and capabilities of hospitals which have been allocated substantial investments, remains unaffected (19). Planning about compensating the shortage of personnel and reaching the hospital wards to personnel standards level and Necessary training for wards` personnel about proper planning and management will increase the efficiency and effectiveness of hospital operations.

### Conclusions

Employment means escaping from functional responsibilities in the public or in the private sector. Since the beds require manpower for providing service. Staff needs should be done through the organization itself or through outsourcing. In each of these situations, whether providing staff is conducted through the organization itself or through contracts with the considered outside firms, consider the efficiency and effectiveness of services must be Experiences in recent years in reducing manpower by forecasting 1.7 personnel for each bed, though apparently led to the miniaturization, but maybe led to the removal of some necessary services, without properly miniaturizing the high and middle level of organization and reducing bureaucracy. According to the study of Sadaghiani (1385) about reducing the human resources of hospitals, a dangerous event has occurred. Because of the impracticability of service providing with 1.7 staff, hospital administration itself have attempted to eliminate some of the hospital beds, which its concept is the differences between active bed and real

capacity of hospital beds. The results of this action were reduction of potentials and thus the "Service Removing" at least 30%, rather outsourcing. In the country's hospitals and especially hospitals that the beds` capacity in hospitals are not used properly and average bed occupancy rate (BOR) are low, hospital management use less human resources and sometimes inappropriate arrangements that has entered an irreparable harm to the body of the hospital system and many of the features and capabilities of hospitals which have been allocated substantial investments, remains unaffected (19). Planning about compensating the shortage of personnel and reaching the hospital wards to personnel standards level and Necessary training for wards` personnel about proper planning and management will increase the efficiency and effectiveness of hospital operations. Totally, factors such as hospital beds occupancy status, education, skills and experience of hospital personnel, physical space of the hospital (the building focus on a block or being diffused) status, hospital equipment, community patients rate and volume of sectors` activity, contradiction of active beds number and approved beds number in hospitals, restrictions on employment authorization, limited funds and limited supply of skilled and trained manpower have impacts on estimating the public sector hospitals human resources. Because many of these factors are not considered in determining the number of required human resources, therefore almost always there is a lack of manpower in current status compared to the organizational standards. At the end, it is suggested that in order to determine the proportion of personnel to specific beds for each hospital, timing and work measurement be done for hospital wards. Also the development of different jobs in studied hospitals in a targeted method and based on the facts with the aims of applying and recruiting new manpower according to the job description and

leading the existent manpower toward this job description is proposed.

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