Original Article

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Evaluation of Human Resources in the Hospitals Affiliated to Babol University of Medical Sciences and Social Security of Qaemshahr City based on the Standards of the Iranian Ministry of Health

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ABSTRACT

BACKGROUND AND OBJECTIVE: Human resources is one of the most important factors in the process of production, as well as the greatest asset of every healthcare institution. Resolution of hospital issues regarding the provision and management of human resources has been a major concern in the field of health care. This study aimed to evaluate human resources in the hospitals affiliated to Babol University of Medical Sciences and Social Security of Qaemshahr city in Iran based on the standards of the Ministry of Health and Medical Education.

METHODS: This cross-sectional study was conducted using an analytical-descriptive approach in 2015 in the hospitals affiliated to Babol University of Medical Sciences and Social Security of Qaemshahr city, Iran. Sample size consisted of all the hospital personnel, with the exception of physicians and maintenance staff. Data were collected using checklists via interviews with head nurses and supervisors. Data analysis was performed in SPSS V.19.

FINDINGS: In total, 3,130 personnel employed at seven hospitals were enrolled in this study. Lowest mean age of human resources was reported in Ayatollah Rohani Hospital (33.74±5.907 years). In addition, the highest number of health care providers in proportion to the total of human resources was reported in Ayatollah Rohani Hospital of Babol and Valiasr Hospital affiliated to the Social Security of Qaemshahr city (65.7% and 64.7%, respectively). Between the studied hospitals, no significant difference was observed regarding the mean of human resources ($p=0.921$). However, a significant difference was observed in the distribution of nursing human resources compared to the standards of the Ministry of Health ($p<0.001$). So that the manpower shortage in medical sections and paraclinic centers in most centers was observed.

CONCLUSION: According to the results of this study, the selected hospitals had surplus of human resources in financial and administrative departments, while shortage of human resources was observed in medical and paraclinical units. Therefore, it is recommended that planning and organization of human resources be performed based on the standards of the Ministry of Health for the recruitment, development and transfer of healthcare personnel.

KEY WORDS: *Hospitals, Human resources, Nursing, Paraclinical, Standards.*

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Introduction

Human resources is one of the most important factors in the process of production, as well as the greatest asset of every healthcare institution (1,2). Human resources is not as a cost assets but are considered as assets of material is dumped (3,4). Resolution of hospital issues regarding the management of human resources has been a major concern in the field of health care (5, 6). Nowadays, the process of health care is changing worldwide, and hospitals are considered as the most expensive sectors of the health system (6,7). As much as 50-80% of the health budget, as well as a large proportion of trained staff and specialists, is allocated to hospital services (8). On the other hand, lack of balance in the provision of human resources has been a major concern for medical universities, which could debilitate the performance of healthcare providers in these institutions (9-11).

Several studies have evaluated the effects of human resource imbalance and shortage of health workforce on the quality of hospital services. For instance, one study was conducted by Elarabi et al. in Malaysia to assess the effect of human resource management on the quality of healthcare services and patient satisfaction (12). In this regard, the findings of Shinjo et al. (Japan) were indicative of a significant correlation between the distribution of human resources and provision of health care for patients (13). In another research, Eygelaar et al. stated that inadequate human resources and lack of professional development were likely to reduce the quality of care in hospitals (14). Furthermore, the results obtained by Matsumoto et al. were indicative of the incompatible distribution of human resources in healthcare centers of different countries such as Japan, America, and England (15).

In Iran, the Ministry of Health and Education has proposed specific standards for human resource management in public hospitals. However, many hospitals do not comply with these standards due to several factors, including insufficient financial resources for staff employment, lack of recruitment permit in some areas of health care, improper use of hospital bed capacity, recruitment of healthcare personnel with inadequate skills, and appointment of staff to non-specialized positions.

To date, no comprehensive studies have been conducted to investigate and compare the performance of medical and non-medical personnel in the hospitals affiliated to Babol University of Medical Sciences and Social Security based on the standards of the Ministry of Health. This study aimed to evaluate the adequacy of human resources in the hospitals affiliated to Babol University of Medical Sciences and Valiasr Hospital of Qaemshahr (affiliated to the Social Security) based on the standards of the Ministry of Health

Method

This cross-sectional study was conducted in seven hospitals affiliated to Babol University of Medical Sciences and Social Security of Qaemshahr city, Iran in 2015. After interviewing the authorities of each hospital unit, the following data were collected: titles and total number of hospital units, total number of beds and bed occupancy rate, number of personnel in each hospital unit, areas of human resource management, and distribution of human resources in terms of gender and education level.

Six hospitals affiliated to Babol University of Medical Sciences were selected for the study, including Ayatollah Rohani, Shahid Beheshti, Shahid Yahyanejad, Shahid Rajayi, 17-Shahrivar, and Amirkolah Children's Hospital. In addition, we evaluated one hospital affiliated to the Social Security of Qaemshahr city (Valiasr Hospital). Study population consisted of all the personnel employed in the selected hospitals, except for physicians and maintenance staff. Data analysis was performed in SPSS V.19 using T-tests, one-way analysis of variance (ANOVA), and Chi-square, and $p \leq 0.05$ was considered significant.

Results

In total, we studied 3,130 personnel employed in seven hospitals, 1,889 of whom (60.35%) were female, and

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1,241 (39.65%) were male. Medical and non-medical units accounted for 61.40% and 39.6% of the allocated human resources, respectively. In addition, the nursing staff constituted the majority of the human resources in these healthcare centers; as such, 1,558 of the studied personnel (49.75%) were recruited as nurses, paramedics, paramedic assistants, and midwives in the hospitals affiliated to Babol University of Medical Sciences and Social Security of Qaemshahr city. Distribution of human resources in financial and administrative departments, maintenance services, and paraclinical units was 17.70%, 12.55%, and 9.9%, respectively, which denotes the lowest level of activity in the paraclinical units of the studied hospitals(table 1). With regard to education level, most of the active human resources (n=1,678; 53.6%) in the hospitals affiliated to Babol University of Medical Sciences and Social Security of Qaemshahr city had bachelor's degree, and only a few of the personnel (n=17; 1.8%) had master's degree. Considering the fact that the highest rate of human resource activity was observed among the nursing staff, education status of these healthcare professionals is of paramount importance.

In this study, out of 1,558 nursing personnel in the selected hospitals, 81.9% had bachelor's degree in this major. As for the other nursing staff, 6.80% had associate degree, 6.1% were paramedical assistants below diploma, 4.1% were paramedics with diploma, and 1.1% had master's degree. The lowest ratio of human resource distribution to hospital beds was observed in Valiasr (1.75) and Amirkola (1.6) hospitals. In this regard, Shahid Rajayi Hospital with 88 human resources and 22 available beds had the distribution ratio of 3.52.

The results of this study were indicative of a significant difference in the distribution of human resources in nursing teams, paraclinical units, and financial and administrative departments between the hospitals affiliated to Babol University of Medical Sciences and Social Security of Qaemshahr city. Therefore, the mean of human resource distribution in different units of the selected hospitals had a significant difference with the mean standards of the Iranian Ministry of Health ($p<0.001$). This marks the lack of human resources in the hospitals affiliated to these two organizations based on the standards of the Ministry of Health (table 2).

Considering the standard number of nurses in each unit of the six hospitals affiliated to Babol University of Medical Sciences (total units: 84), the mean number of nursing staff was estimated at -21.47±32.5. This value was estimated at -19.77±39.6 in Valiasr Hospital (total units: 17) affiliated to the Social Security of Qaemshahr city. In this regard, the results of this study were indicative of no significant difference between the mean number of nursing staff in the hospitals affiliated to Babol University of Medical Sciences and Social Security of Qaemshahr city.

According to our findings, the median of the number of nurses in each unit of Ayatollah Rohani Hospital had the least significant difference with the standards of the Ministry of Health. On the other hand, the most significant difference in the median number of nursing staff with the standards of the Ministry of Health was observed in Shahid Rajayi Hospital. In this regard, the results of this study were indicative of a significant difference between the distribution of human resources in the selected hospitals and standards of the Ministry of Health ($p<0.001$) (Diagram 1).

According to our findings, all the studied hospitals, except for Shahid Beheshti Hospital (18.4%), had shortage of paraclinical human resources in proportion to the standards of the Iranian Ministry of Health. In this regard, the most significant difference in the distribution of human resources in 17-Shahrivar and Shahid Rajayi hospitals was reported to be -37.5% and 38.3%, respectively (Diagram 2). On the other hand, Valiasr Hospital of Qaemshahr had complete correspondence with the standards of the Ministry of Health in terms of the distribution of administrative human resources, while human resources in the financial department of this hospital exceeded the standard level. In this regard, Amirkola Children's Hospital had the most significant difference with the standards of the Ministry of Health (-27.5%). Also, with the exception of 17-Shahrivar Hospital (-33.3%), all the studied hospitals were reported to have surplus of financial human resources (Diagram 3).

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Table 1. Composition and Ratio of Human Resources Based on the Units of Hospitals Affiliated to Babol University of Medical Sciences and Social Security of Qaemshahr City (2015)

Hospital	Nursing Team N(%)	Paraclinical Unit N(%)	Financial and Administrative Departments N(%)	Maintenance Services N(%)	Other Staff N(%)	Total
Shahid Yahyanejad	221(47.60)	37(8)	87(18.70)	76(16.40)	43(9.30)	464
Shahid Beheshti	273(43.80)	70(11.25)	110(17.65)	84(13.50)	83(13.80)	620
Ayatollah Rohani	576(56)	94(9.25)	161(15.75)	134(13)	62(6)	1027
Amirkola Children's Hospital	153(48.60)	40(12.75)	58(18.45)	42(13.35)	22(6.65)	315
Shahid Rajayi	20(22.70)	9(10.40)	30(34)	4(4.50)	25(28.40)	88
17-Shahrivar	22(36.10)	6(9.80)	17(27.90)	6(9.80)	10(16.40)	61
Valiasr (Qaemshahr City)	293(52.75)	54(9.75)	92(16.55)	45(8.15)	71(13)	555
Total	1558(49.75)	310(9.90)	555(17.70)	391(12.55)	316(10.10)	3130

Table 2. Comparison of Human Resources in Nursing Teams, Paraclinical Units, and Financial and Administrative Departments Based on Standards of Ministry of Health in Hospitals Affiliated to Babol University of Medical Sciences and Social Security of Qaemshahr City (2015)

Hospital	Available Beds	Available Nursing Staff	Standard Nursing Staff	Available Paraclinical Staff	Standard Paraclinical Staff	Available Financial and Administrative Staff	Standard Financial and Administrative Staff	Ratio of Human Resources to Available Beds
Shahid Yahyanejad	242	221	290	37	42	87	80	2.46
Shahid Beheshti	280	273	381	70	52	110	101	3.1
Ayatollah Rohani	512	576	692	94	104	141	147	2.64
Amirkola Children's Hospital	196	153	229	40	44	85	65	2.37
Shahid Rajayi	25	20	34	9	15	30	21	4
17-Shahrivar	28	22	35	6	18	17	19	4.06
Valiasr (Qaemshahr City)	316	293	375	54	72	92	87	2.36
Total	1599	1558	2036	310	347	555	520	2.22

Discussion

According to the results of the present study, the highest proportions of human resources were reported in Ayatollah Rohani (65.7%) and Valiasr (64.7%) hospitals. Furthermore, no significant difference was observed between the studied hospitals in terms of the mean of human resources; however, there was a significant difference between the distribution of nursing human resources and standards of the Ministry of Health in the selected hospitals. In the current research, no specific patterns were identified in the distribution of human resources in the studied hospitals, which is consistent with the results obtained by Ghazi Mirsaeid et al. (10). According to their findings, distribution of skilled human resources in different units of the hospitals affiliated to Tehran University of Medical Sciences followed no specific pattern in the area of human resource management; nevertheless, distribution of human resources in these hospitals was in accordance with the guidelines of the

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Iranian Ministry of Health. According to the literature, international standards and guidelines proposed by the Iranian Ministry of Health, human resource management costs account for 55-66% of the total expenses in every hospital. This denotes the importance of human resources in hospitals, as well as the pivotal role of this parameter in determining the expenses of healthcare organizations.

Therefore, it is recommended that hospital authorities control the costs imposed by human resources using necessary standards and proper human resource management. Moreover, appropriate management of different hospital staff by improving the efficiency of the personnel is of paramount importance in this regard (16). According to the results of the current study, distribution of human resources in the hospitals affiliated to Babol University of Medical Sciences and Social Security of Qaemshahr city did not follow a specific pattern. Consequently, most of these hospitals were faced with human resource shortage in different units, especially in nursing teams and paraclinical sections. Correspondingly, out of 101 units in seven studied hospitals, 80 units (79.2%) had shortage of human resources, 13 units (12.9%) had human resource surplus, and only eight units (7.9%) complied with the standards of the Ministry of Health in terms of human resource distribution. These findings are in line with the results obtained by Rekab Esmailzadeh regarding the distribution of human resources in different units of the hospitals affiliated to Ahwaz University of Medical Sciences. Accordingly, these hospitals had surplus of human resources (14.5%) compared to the standards of the Ministry of Health. On the other hand, 79% of the units in these hospitals had shortage of human resources, and 6.45% complied with the standards of the Ministry of Health in terms of human resource distribution (17).

In another research, Arab et al. evaluated the distribution of human resources in the hospitals affiliated to Ilam University of Medical Sciences and reported that out of 62 hospital units, 48 (77.42%) had shortage of human resources compared to the standards of the Ministry of Health (18). In the present study, ratio of human resources to available beds in hospitals of Shahid Yahyanejad, Shahid Beheshti, Ayatollah Rohani, Amirkola, Shahid Rajayi, and 17-Shahrivar (affiliated to Babol University of Medical Sciences) was estimated at 2, 2.21, 2, 1.6, 3.52, and 2.18, respectively. This value was reported to be 1.75 in Valiasr Hospital affiliated to the Social Security of Qaemshahr city. The significant difference in the ratio of human resources to available beds in the hospitals affiliated to Babol University of Medical Sciences and Social Security of Qaemshahr city is indicative of the severe shortage of human resources in these healthcare institutions. In this regard, ratio of human resources (except for medical teams) to available hospital beds was estimated at 2.56, 2.08, and 2.75, respectively in Imam Khomeini, Mostafa Khomeini, and Taleghani hospitals affiliated to Ilam University of Medical Sciences (18).

Compared to the standards of the Management and Planning Organization in Iran, ratio of human resources to available beds in Shahid Yahyanejad, Ayatollah Rohani, Amirkola and Valiasr hospitals was consistent with the hospitals affiliated to Ilam University of Medical Sciences. However, this ratio was observed to have a significant difference in Shahid Rajayi and 17-Sharivar hospitals.

According to the results of the present study, the most significant difference with the standards of the Ministry of Health in terms of human resource distribution was observed in the nursing staff of the studied hospitals. In one study, Bahadori et al. evaluated the distribution of human resources in different hospitals of Ahwaz and Ilam and reported that human resource distribution was lower than the standards of the Ministry of Health in 89.5% of hospital units. In addition, only 2% of the hospital units complied with the standards of the Ministry of Health in this regard, while 8.5% of the hospital units had surplus of nursing staff.

Also, the highest rate of nursing staff shortage was reported in the emergency sections of the hospitals in Ahwaz and Ilam (19). Similar to the present study, Abolhalaj et al. reported that hospital support units had higher staff picks compared to other departments, denoting the negative impact of this human resource

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surplus on proper healthcare provision in hospitals (8). In another study, Frost et al. emphasized the pivotal role of nursing staff in assuring patient safety in different hospital units. Considering the general shortage of nursing staff, education level and area of expertise must be regarded as the key factors in reducing patient complications in different nursing departments (20).

In the current study, the majority of human resources in the selected hospitals had bachelor's degree (53.6%), and only 1.8% of non-medical human resources had master's degree in related majors. Given the large proportion of human resources recruited in nursing teams, special attention should be paid to the education level of these healthcare providers. In the present study, among the human resources employed in the hospitals affiliated to Babol University of Medical Sciences and Social Security of Qaemshahr city, 81.9% of the nursing staff had bachelor's degree. In another study conducted by Aiken et al. in the hospitals of nine European countries, increased number of the nursing staff with bachelor's degree (10%) was reported to reduce the mortality rate of patients by 7%. Furthermore, it was suggested that high workload imposed on nurses could increase the mortality rate of the patients who were hospitalized for less than 30 days. In this regard, it has been reported that the mortality rate of patients could decrease by 30% in the hospitals where 60% of the nursing personnel have master's degree compared to the hospitals where only 30% of the nursing staff have master's degree. Correspondingly, the American Hospital Association has claimed that high mortality rate and failure in patient rescue interventions could significantly decrease (4%) with a 10% increase in the number of nursing staff with bachelor's degree (21). According to the literature, balance in human resources plays a pivotal role in the provision of high-quality hospital services, whereas lack of balance could adversely affect the quality of care and patient satisfaction. Considering the results of the present study regarding the distribution of human resources in the studied hospitals, as well as the significant difference in this parameter (especially in nursing staff), it is recommended that hospital authorities and healthcare policymakers fully comply with the standards of the Ministry of Health in the recruitment, development and transfer of human resources.

One of the limitations of the current research was that some of the personnel were employed temporarily or worked part-time in the selected hospitals. Another limitation was lack of accurate reports about human resources by the related authorities due to the high workload. Nevertheless, these limitations were resolved by the direct supervision and follow-up of the researchers.

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