



## Factors influencing the creativity and innovation in managers of military and civilian hospitals in Tehran, Iran

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### Introduction

The changes in today's world have caused organizations to be creative and innovative and set their goals and interests toward creativity and innovation in order to survive in such a variable and unstable atmosphere.

### Abstract

Similar to other organizations in the society, hospitals need creative and innovative managers to survive and progress. Developing and training such managers require a suitable context that should be provided through determining factors affecting creativity and innovation in individuals. This study was conducted to determine the factors influencing creativity and innovation of managers in military and civilian hospitals in Tehran, Iran. In this cross-sectional study, the senior and middle managers of 9 military and civilian hospitals comprised the statistical population (90 people). The data were collected using a questionnaire. The data collected were analyzed in SPSS software. The ANOVA test was used to compare mean scores of different groups. The maximum and minimum possible score for the factors influencing creativity and innovation was chosen as 3 and 1, respectively. The results showed the organizational factors with the score 56.2 as the most important factors influencing creativity of managers in military and civilian hospitals. Among the subcategories of the organizational factors, the factors related to reward system gained the maximum score. The most important factors influencing innovation of hospital managers were personal factors with the score 83.2 the factors related to knowledge and expertise of managers received the highest score in this category. Based on the results, the provision of a favorable organizational environment can encourage hospital managers to be creative. Moreover, making changes in the culture governing hospitals and making innovation a positive value and norm may be beneficial.

**Keywords:** Creativity, Innovation, Manager, Hospital

The unpredictability of future status of affairs and changes, which some experts believe is the most important feature of the information age, has necessitated the focus on the creativity and innovation, especially in managers, more than ever [1].

The necessity for creativity and innovation in organizations has increased to the extent that some references consider the lack of creativity and innovation equal to the destruction of organizations in the long run [2]. Organizations without creativity and innovation cannot survive and would vanish over time. In this respect, organizations always seek methods to enhance creativity and innovation (personally and organizationally) and eliminate the barriers in this regard [3]. The importance of creativity and innovation in success of organizations is not limited to manufacturing sectors but true and even higher for service sectors, including hospitals where the services can be copied rapidly by their competitors [4]. Creativity and innovation of service sectors, especially the health and treatment sector, are essential for countries like Iran. The accelerating growth of technology necessitates creativity and innovation for reducing the gap between the developed industrial world and the current realities of these countries that gets deeper every second. The importance of creativity and innovation in success of organizations has urged many scientists and scholars to identify the factors promoting and inhibiting creativity and innovation in individuals working in organizations through determining these factors and their results [5]. Tierney *et al.* determined the relationship of creativity with personal and organizational factors. They studied 191 employees working in the research and development department of large chemical manufacturers and found the positive relationship of creativity with personal and organizational factors. Those factors included individuals' innate motivation, their supervisors' creativity and support for creative employees [6]. Gumusuqlu and Arezoo Ielsu conducted a study titled the transformational leadership and organizational creativity and innovation in order to determine the influence of leadership on levels of creativity on 163 personnel and managers of research and development departments in Turkey in 2009

and found that leadership highly influenced the levels of creativity in the organization [7]. Michael W.L. and Guarder performed a study titled creativity and surgeon in teaching hospitals in Greenville, United States in 2009 and found a close relationship between surgery and creativity [8]. The results of the above study emphasized the importance of creativity in all health and medical products and all physicians, students, and residents and showed that creativity of physicians and surgeons in surgical care led to higher workload and quality of medical services. In their study titled the relationship of creativity and organizational performance in Taiwan in 2010, Jung Jen Chen and Vi Fen Hung examined the effect of the relationship between creativity and organizational performance [9]. The results of the above study on 305 Taiwanese companies working in the field information technology (IT) showed that creativity resulted in higher organizational performance in different organizations. Creativity and innovation have been studied also in Iran. Mahmoud Elahi aimed to identify the factors affecting organizational creativity and innovation from the perspective of managers and their deputies in governmental organizations in Kerman, Iran in 1999 [10]. Sajjadi also conducted a study to examine the most important factors influencing creativity and innovation in hospital managers in Isfahan, Iran in 2004. Based on the above study, the provision of a favorable organizational environment could encourage the hospital managers to be creative, and such an environment necessitated the modification of payment systems and designing a payment system appropriate for hospitals. The study also recommended managers to increase their knowledge and expertise through studying and trying to acquire more experiences [11]. In their two-step study on the steel industry, Mahlouji, Hendijani, and Kermanshah examined the effect of the social responsibility on

innovation in corporations with a resource-based perspective [12]. Similar to other organizations in the society, hospitals need creative and innovative managers to survive and progress [13]. Developing and training such managers require a suitable context that should be provided through determining the factors affecting creativity and innovation in individuals. Therefore, it is necessary to identify these factors and suggest strategies to enhance them. The present study was conducted to achieve the above objective and determine the factors affecting creativity and innovation in hospital managers.

### Method

This cross-sectional study was performed in 2010. All the 90 senior managers (hospital director, hospital manager, and nursing service manager) and middle managers (treatment manager, administrative manager, support manager, finance manager, clinic manager, manager of medical assistance services, and health manager) of 9 hospitals were invited to participate in the study. The data were collected using a 3-section questionnaire that was formulated after studying and determining the factors influencing creativity and innovation in managers. The first part of the questionnaire covered demographics (9 items on the first page of the questionnaire), the second part contained 18 items for determining the most important factors influencing creativity in managers (16 closed-ended questions and 2 questions for prioritization), and the third part comprised 19 items for determining the most important factors influencing innovation in managers (17 closed-ended questions and 2 questions for prioritization). The face validity of the questionnaire had been determined through library studies and the internet and using specialized texts, opinions of professors and specialists. Once face validity of the questionnaire was verified by experts, construct validity including content validity and internal consistency was determined using Hamilton's method and

the Cronbach's alpha (0.79). To determine the reliability of the questionnaire, a pilot study was performed in one of the above-mentioned hospitals using the test-retest, and correlation coefficient  $r=81.2\%$  showed the favorable reliability of the questionnaire. The data obtained from the 90 questionnaires were analyzed using the SPSS-17. The ANOVA test was used to compare the mean scores of the different groups. The maximum and minimum possible score for the factors influencing creativity and innovation was chosen as 3 and 1, respectively. The significance level in this study was 0.05.

### Results

The results showed that 57.5% of the participants were male, and the rest of participants were female. In terms of the age distribution, 39% of the 78 participants who declared their age in the questionnaire were in their 40s and comprised the highest percentage of age distribution. Regarding the education level, 52.6% of the participants had bachelor's degree and comprised the highest percentage of educational degrees, and participants with high school diploma comprised the lowest percentage (3.8%) of the educational degrees. Most participants were married (78.2%), and permanently employed (59%). Most of the 78 participants who answered the question on the years of service had over 20 years of service (37.7%). Among the participants, minimum and maximum years of service were 2 years and 58 years, respectively. In terms of the organizational position, few participants were directors. The most important factors influencing creativity in managers of the military and civilian hospitals were the organizational factors with the score 2.56. Of the subcategories of the organizational factors, the factors related to the reward system gained the maximum score. The most important factors influencing innovation of hospital managers were personal factors with the score 2.83; the factors related to

the knowledge and expertise of the managers received the highest score in this category.

Table 1 shows the priorities of the personal

**Table 1** *The mean scores of individual factors affecting creativity from the perspective of individuals under review according to the type of hospital (n=78)*

	Public hospitals	Private hospitals	Military hospitals	P (ANOVA)
Factors related to the managers knowledge	79.2	84.2	73.2	0.73
Factors related to the managers intellectual abilities	62.2	61.2	52.2	0.83
Factors related to the managers mood	57.2	66.2	78.2	0.33
Motivational factors	72.2	66.2	34.2	0.82

factors influencing the creativity are similar in public and private hospitals. In other words, the factors related to managers' knowledge in public and private hospitals and the factors related to managers' temperament in military hospitals were identified as the mostly influencing factors on creativity. Moreover, factors related to intellectual abilities of managers in public and private hospitals and motivational factors in military hospitals had

the least effect on creativity.

The last column shows the result of the test. Considering the obtained odds ratio, it was concluded that the mean score obtained from the factors related to knowledge, intellectual abilities, and motivation in the three types of hospitals did not significantly differ from one another at the significance level of 5% (P-value > 0.05).

Table 2 shows the mean score of prioritizing

**Table 2** *The mean scores of organizational factors affecting creativity from the perspective of individuals under review according to the type of hospital (n=78)*

	Public hospitals	Private hospitals	Military hospitals	The test result
Factors related to the reward system	65.2	76.2	73.2	41.0
Factors related to the education system	71.2	57.2	60.2	66.0
Factors related to leadership style	71.2	69.2	63.2	87.0
Factors related to organizational culture	48.2	42.2	28.2	24.0
Factors related to organizational structure	30.2	36.2	28.2	85.0
Factors related to facilities	62.2	69.2	77.2	57.0

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organizational factors affecting creativity, similar results were obtained in public and private hospitals with the focus on factors related to leadership style and reward system, respectively. However, unlike the total result of the study and the public and private hospitals, military hospitals prioritized the facilities as the most influential factors and then factors related to leadership style and education, respectively as the second

and third priority. The factors related to organizational culture and structure respectively comprised last priorities. Regarding the obtained odds ratio shown in the test result column, the mean score of each factor in the three types of hospitals did not significantly differ from one another at the significance level of 5% ( $P > 0.05$ ). According to Table 3, similar to the total result, personal factors mostly influencing

**Table 3** *The mean scores of individual factors affecting innovation from the perspective of individuals under review according to the type of hospital (n=78)*

	Public hospitals	Private hospitals	Military hospitals	P (ANOVA)
Factors related to science and knowledge	93.2	92.2	95.2	88.0
Motivational factors	86.2	2.76	2.82	df=2 P-value=0.67
Factors related to mood	2.79	2.65	86.2	df=2 P-value=0.28

innovation in the three types of hospitals was related to managers' knowledge; the motivational and temperamental factors were the next priorities of the public and private hospitals, and temperamental and motivational factors were the next priorities of the military hospitals. ANOVA test showed

that the mean score of personal factors affecting innovation in the three hospitals did not differ significantly from one another at the significance level of 5% ( $P > 0.05$ ).

Table 4 shows that factors related to leadership style in public and military hospitals and factors related to organizational culture in

**Table 4** *The mean scores of organizational factors affecting innovation from the perspective of individuals under review according to the type of hospital (n=78)*

	Public hospitals	Private hospitals	Military hospitals	The test result
Factors related to organizational culture	2.72	2.75	2.67	0.72
Factors related to facilities	2.57	2.58	2.50	0.89
Factors related to organizational structure	2.62	2.32	3.23	0.19
Factors related to leadership style	2.75	2.66	2.72	0.72
Factors related to the reward system	2.46	2.69	2.60	0.30
Factors related to the education system	2.65	2.70	72.2	0.90

private hospitals mostly influenced innovation in managers. ANOVA test showed that the mean score of organizational factors affecting innovation did not differ significantly from one hospital to another at the significance level of 5% ( $P > 0.05$ ).

### Discussion

The results on the subcategories of personal factors influencing creativity, including managers' knowledge and expertise, intellectual abilities, temperament and motivation, showed managers' knowledge and expertise was the most important personal factor with the score 2.79 (of maximum 3 points). The priorities of the personal factors influencing managers' creativity were different in our study compared to other studies. Previous studies showed motivation is the most influential personal factor [6,9,15-17]. However, the present study determined the factors related to managers' temperament as the first priority in this regard. It can be argued that although motivation is necessary for presenting new ideas, the participants believed that motivation was a dependent factor, and provided that managers believe in themselves and have sufficient knowledge about the truths, principles, and opinions related to their activities and the skills and capabilities specific to creativity, managers will be motivated to be creative. However, if motivation exists when the conditions are not desirable, motivation disappears.

The results on the subcategories of the organizational factors influencing creativity, including factors related to organizational structure of hospitals, organizational culture of hospitals, leadership styles, educational system, reward system, and required facilities, showed that factors related to reward system were the most important factors influencing creativity with the score 2.71 (of maximum 3 points). Comparison of the results obtained from the tables and also the question related to the prioritization of the organizational factors influencing creativity in managers showed that factors related to the reward system of

the hospital were the most influential factors among the 6 categories. This finding had been also achieved by other researchers [10,16,18]. On the second objective of the study, "determining the factors influencing the managers' innovation in selected military and civilian hospitals in Tehran," the analysis of the data showed that personal factors with the score 2.83 (of maximum 3 points) were more influential than the organizational factors with the score 2.65 (of maximum 3 points). This result had been obtained by some other studies [11-19]. However, fewer studies reached this conclusion than those that found organizational factors more influential. Most previous studies showed that organizational factors were more influential on people's innovation [18], and some other studies only examined the more influential supposing that only these factors were influential on innovation [19]. The presentation of new ideas in hospitals depends more on an appropriate organizational environment rather than personal abilities. In other words, managers can create new ideas if there are appropriate conditions. However, personal factors are more important than organizational factors when implementing the new ideas. In this step, if managers are skillful enough, they can defend their new ideas with their thorough information and convince others to accept their ideas, are patient and can tolerate any kind of defeat, and are motivated enough to implement their ideas, they can implement their new ideas in the hospital and solve organizational problems. Moreover, the results on determining personal factors influencing managers' innovation showed that factors related to managers' knowledge and expertise with the score 2.93 (of maximum 3 points) were the most influential factors among the subcategories of personal factors influencing innovation, including managers' knowledge and expertise, temperament, and motivation. The results on determining organizational factors influencing managers' innovation showed that factors related to organizational

culture with the score 2.71 (of maximum 3 points) were the most influential factors among subcategories of organizational factors influencing innovation, including factors related to organizational structure of the hospital, organizational culture of the hospital, leadership style, educational system, reward system, and required facilities.

The comparison of the results obtained from the tables and also the question related to the prioritization of the organizational factors influencing innovation in managers showed that factors related to organizational culture of the hospital were the most influential factors among the 6 categories of organizational factors influencing innovation. Other studies also had confirmed the influence of appropriate culture on innovation [5,15,21,22]

### Conclusion

The present study showed that organizations where individuals were encouraged to implement their ideas and tolerated failure experienced more innovations. It is useless to expect innovation when there is no appropriate culture accepting innovations and changes. The importance of the influence of organizational culture on innovation was the subject of a study that showed organizational culture was highly influential on innovation in people working in organizations [20]. When the pressure of health-providing organizations and also insurance companies makes hospitals reduce the costs effectively, the hospitals should try to be more innovative and survive longer [23]. A creative and innovative hospital needs creative and innovative managers who can predispose creativity and innovation in themselves and other personnel. One of the major limitations of this study was collecting data from military hospitals. However, this limitation was obviated as the researcher was military personnel and had already coordinated with the relevant authorities in the military hospitals.

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### Contributions

Study design: AA

Data collection and analysis: SHT, HR, SH

Manuscript preparation: SHT, ZKKM, MSH

### Conflict of interest

"The authors declare that they have no competing interests."

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