

## Original Article

# Development of structural equation model for human resource management in health sectors

Sara Tavakoli <sup>1</sup> , Sanjar Salajegheh <sup>1\*</sup> , Saeed Sayadi <sup>1</sup> , Masoud Pourkiani <sup>1</sup> ,  
Hojat Babaei <sup>2</sup> 

<sup>1</sup> Department of Management, Kerman Branch, Islamic Azad University, Kerman, Iran.

<sup>2</sup> Department of Mathematics, Kerman Branch, Islamic Azad University, Kerman, Iran.

**Corresponding author and reprints: Sanjar Salajegheh**, Associate Professor, Department of Management, Kerman Branch, Islamic Azad University, Kerman, Iran.

**Email:** [s.salajeghe@iauk.ac.ir](mailto:s.salajeghe@iauk.ac.ir)

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## Abstract

**Background:** To achieve sustainable productivity, creativity and innovation, proper quality of organizational performance, and effective management of human resources is essential. The aim of this study was to determine the structural equation model of human resources management in healthcare centers.

**Methods:** This study was a descriptive-correlational. Library search method was used to review the literature. The statistical population of the study included staff of health centers and experts in different departments of Hormozgan health centers (n=420). According to the Cochran's formula, the sample size was 200 people who were selected by random sampling. To collect data by reviewing the research literature and surveys of experts. A researcher-made questionnaire was prepared that includes 50 items in the form of 6 categories, including contextual, interventional, core concept, the strategies and the consequences. To analyze the data, structural equation modeling was used in PLS software.

**Results:** Causal factors have had an effect on strategies with a rate of 0.705 in the main category (employment and retention of hospital employees) and the main category (recruitment and retention of hospital employees) with a rate of 0.379 with a confidence level of 95%. Intervening factors with a rate of 0.129, background factors on strategies with a rate of 0.457, and finally strategies with a rate of 0.849 had an effect on the results.

**Conclusion:** Strategic human resource management has been presented as the only way to the success of health centers in the new era.

**Keywords:** Hospital Administration; Mediation Analysis; Personnel Selection; Workforce.

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## Introduction

To achieve sustainable productivity, creativity and innovation and proper quality of life, efficient, effective and intelligent management of human resources is essential. Human is at the focus of attention in the topics of organizational behavior management and human resource

management of health centers and it has a special importance and status in modern management (1). However, if the necessary conditions are not provided in health centers and the necessary motivation is not created for the staff of health centers, there will not be much success in sharing

knowledge and organizational innovation even by attracting the best staff and establishing advanced communication and information technologies (2).

Health and medical centers can enter into the process of value creation and strengthening their foundation by implementing the strategy of recruiting human resources as the basic strategy of health and treatment centers, they can attract and train talented people and improve the performance of employees and create the conditions to achieve organizational goals such as human resources management, performance management of health workers. In the human resources of that health center, organization will be successful that can make the best use of this capital, which requires the use of new management methods to attract and retain human resources and guide them in the best way (3). Human resource management activities in health centers will lead to fulfillment of its functions and tasks. Also, in the staff dimension, it will lead to meeting the expectations of others from this health center management, that is, human resource plans (4), as well as operational duties (including staff recruitment, service compensation, staff empowerment, and staff retention (2). Strategic human resource management has been presented as the only way to success of health centers in the new era (5).

In general, comprehensive attention has not been paid to integrated and complete models to examine all the factors affecting the employment and retention of employees, especially in public health centers, and this issue as a whole requires more investigations (2). It can be said that the importance of the strategic role of human resources management in healthcare centers in creating their competitive advantage, the purpose of this research was to determine the structural equation model of human resources management in healthcare centers.

## Methods

*Study design:* This research was designed with a descriptive-correlation method and a survey method with the aim of determining a model for human resource management in health care centers. General information was collected by the library method.

*Target population:* The statistical population of the study included staff of health centers and experts in different departments of Hormozgan health centers

*Sampling and data collection:* The sample size was determined based on the estimate of Cochran's formula of 200 people who were selected by random sampling method. In order to collect data, a researcher-made questionnaire was designed, which included 50 items in the form of 6 categories: 4 categories of factors: "identification of employability", "occupational adaptation", and "suitability of the person to a job (individual-health centers)" and "Improvement of motivational structures" were selected as a factor. In the study, effective factors for the effective employment and retention of employees in the studied health care centers: the factors in two groups, including "demographics" and "employment policies of health care centers" were determined as background factors in the phenomenon of attracting and retaining employees in the studied health care centers.

*Questionnaire design:* Three groups of factors including "political conditions and relations in health care centers", "organizational and structural factors" and "cultural factors and constructive culture" were selected as intervening factors in the phenomenon of effective recruitment and retention of employees in the studied health care

centers. The main and central phenomenon was "effective and appropriate recruitment and retention of health care center employees". Six categories of factors included "training and empowerment for career advancement", "delegation of authority and opportunity for professional development" "diversity healthcare center management", "management style", "organizational creativity and innovation" and "learning and problem solving" » were selected as the factors of promotion of the effective attraction and retention of employees in the studied health centers. Three groups including "Improving the efficiency and performance of health care centers", "Improving human capital and social capital", "Improving internal marketing" and "Learning and problem solving" were identified as the results of the phenomenon of effective recruitment and retention. Employees of health and treatment

centers KMO data adequacy test was obtained at 0.701, which shows that the number of samples was sufficient for factor analysis and the significance of Bartlett's test was less than 0.05.

To analyze the data, structural equation modeling was used in PLS software.

Conceptual Model of Research is presented in figure 1.

### Results

The age group of 60-51 years was highest, most of them had a bachelor's degree.

Validity and reliability of the measurement model

These criteria include Average Variance Extracted (AVE), composite reliability (CP) and alpha, as presented in Table 1. The results show that all variables have a criterion limit.

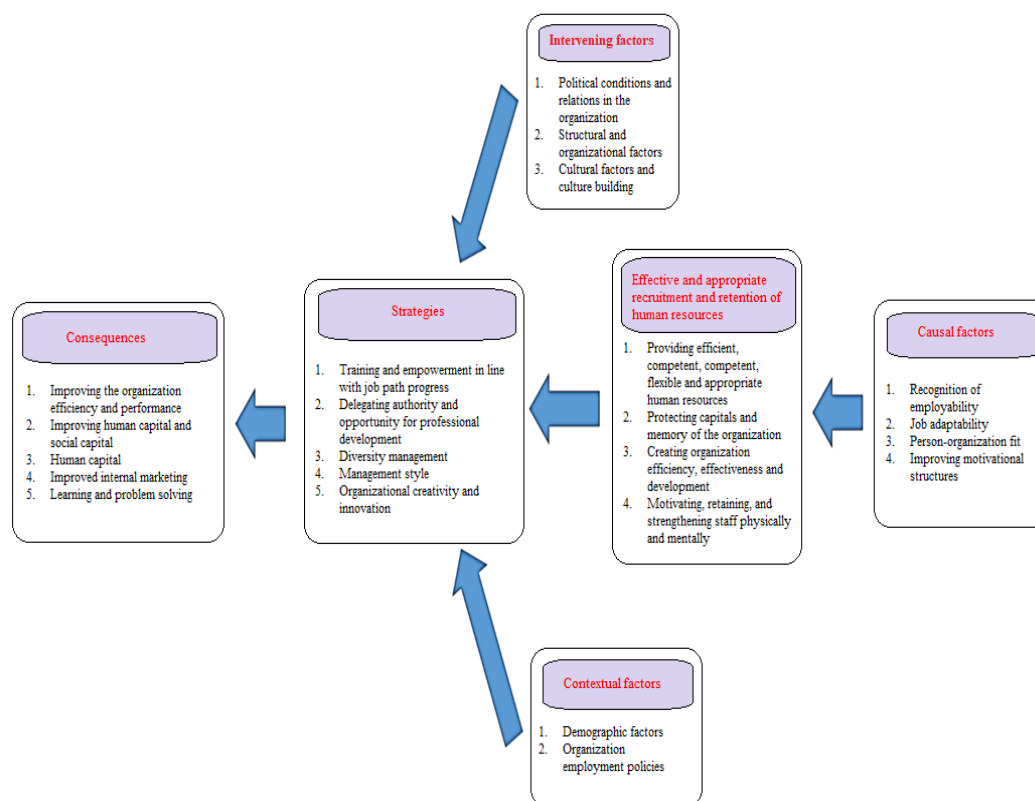


Figure 1. Human resource management model in health centers

Table 1. Composite reliability and Cronbach's alpha as index reliability tests and mean variance extracted (AVE) as convergent validity tests

Variable/index	CR	AVE	$\alpha$
Causal factors	0.758	0.566	0.732
Intervening factors	0.790	0.519	0.713
Underlying factors	0.900	0.750	0.834
Strategies	0.849	0.553	0.865
Consequences	0.860	0.587	0.828
The main category	0.911	0.515	0.898

**Divergent validity**

Table 2 shows the results of Fornell-Larcker test as a divergent validity test. According to the results, AVE of all research variables is less than 0.9.

*Structural pattern test*

Figure 2 and Figure 3 show the tested models in significant and standard modes:

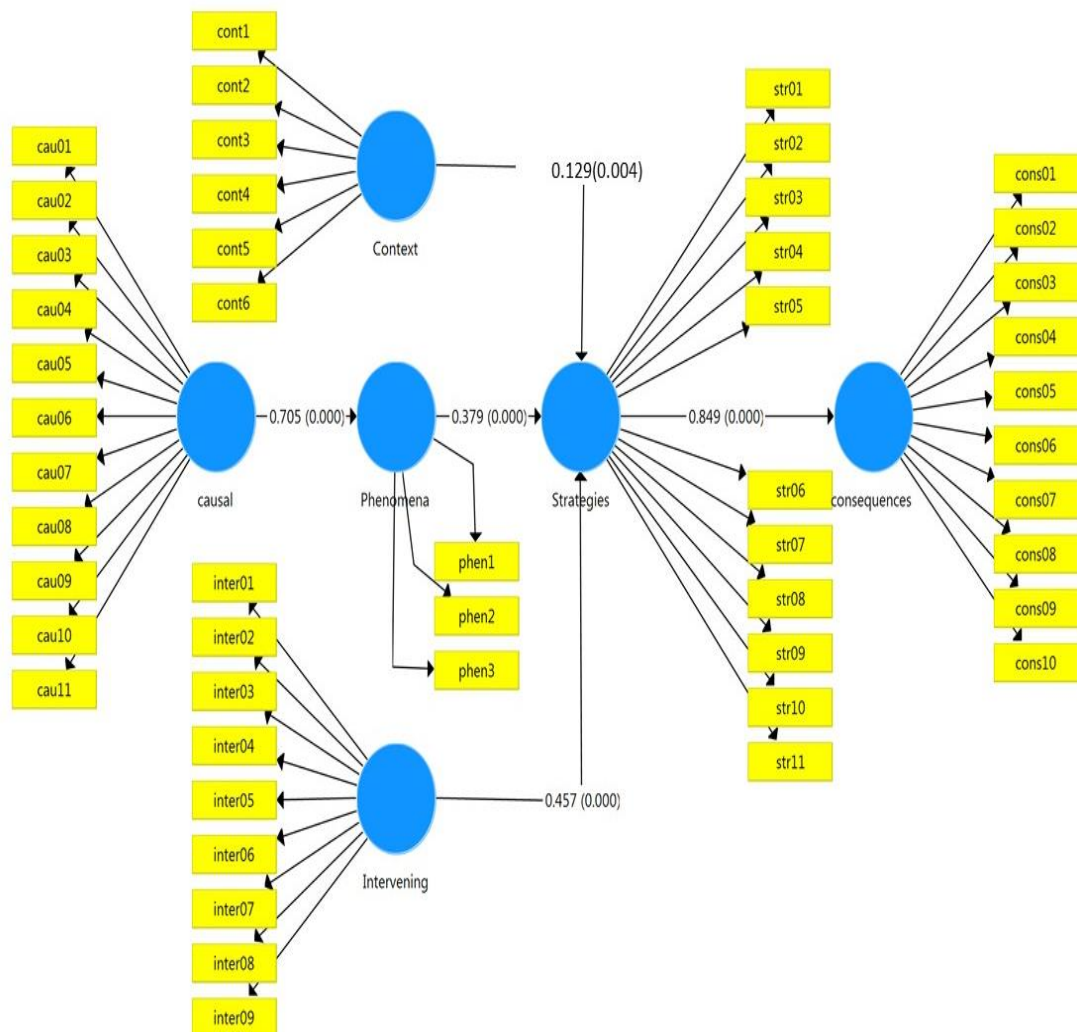


Figure 2. Model in standard mode

Table 2. Fornell-Larcker test

Variable	1	2	3	4	5	6
Causal factors	0.605					
intervening factors	0.719	0.565				
Underlying factors	0.664	0.780	0.866			
Strategies	0.710	0.864	0.822	0.673		
Consequences	0.709	0.752	0.705	0.752	0.622	
The main category	0.626	0.753	0.781	0.849	0.766	0.718

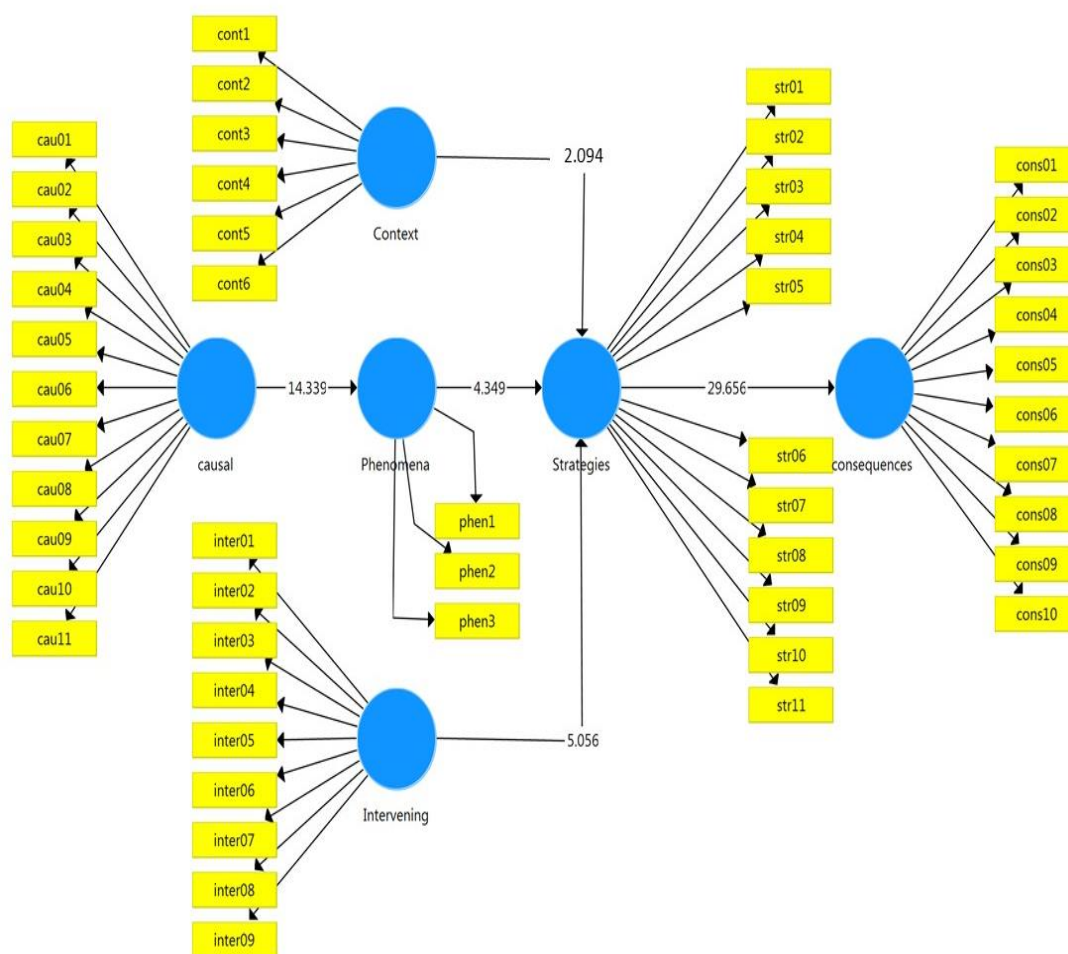


Figure 3. Model in significant mode (T-value)

In the figures above, T-coefficients are reported for research path. T coefficients are not less than 1.96. Also, Table 3 presents the estimation of path coefficients and the explained variance of the research variables.

According to the results in Table 3, For the first path, t-value is greater than 1.96 and

the significance of the test is less than 0.05, so with a 95% confidence level, causal factors have an impact on main category (recruitment and retention of health center staff) at the rate of 0.705.

For the second path, t-value is greater than 1.96 and the significance of the test is less than 0.05, so with a 95% confidence level,

Table 3. Path coefficients and t-test for the effects of variables on the paths of the research structural model

Path	Path description	Statistic t	Path coefficient (CI)	Significance statistic	result
1	Causal factors to the main category (creating value for the customer in banking)	24.335	0.705 (0.51-1.44)	0.000	confirmed
2	The main category (creating value for the customer in banking) to strategies	4.349	0.379 (0.212-1.01)	0.000	confirmed
3	Intervening factors to strategies	2.094	0.129 (0.099-1.002)	0.004	confirmed
4	contextual factors to strategies	3.056	0.457 (0.378-1.21)	0.000	confirmed
5	Strategies to consequences	29.656	0.849 (0.698-1.65)	0.000	confirmed

the main category (recruitment and retention of health center staff) has an impact on strategies at the rate of 0.379.

For the third path, t-value is greater than 1.96 and the significance of the test is less than 0.05, so with a 95% confidence level, the intervening factors have an impact on strategies at the rate of 0.129.

For the fourth path, t-value it is greater than 1.96 and the significance of the test is less than 0.05, so with a 95% confidence level, the contextual factors have an impact on strategies at the rate of 0.457.

For the fifth path, it is greater than 1.96 and the significance of the test is less than 0.05, so with a 95% confidence level, the strategies have an impact on the consequences at the rate of 0.849.

#### *Model fit*

The values of the coefficients of determination for the latent variables of the model indicate the degree of effect of the dependent variables on the independent variable. 0.497% of the changes in recruitment and retention of health center staff, 0.790% of structural changes in strategies in attracting and retaining health center staff, and 0.720% of the structural changes in consequences are explained by the causal factors, contextual factors and intervening factors.

The general fit of the model with the GOF index, which should be greater than 0.3, indicates that this index is appropriate:

$$GOF = \sqrt{\text{Communalities} \times R^2} = 0.541$$

According to the results of this research, the scale developed in the human resource management model of Hormozgan health centers has high validity and reliability. According to the confidence level of 95%, the causal factors of the main group (attracting and retaining hospital personnel) and the main group (recruiting and retaining hospital personnel) had an impact on strategies by 0.705. Intervening factors with a rate of 0.379 on strategies with a rate

of 0.129, background factors on strategies with a rate of 0.457 and finally strategies with a rate of 0.849 have been effective in the results. It can be said that the path analysis in the model extracted from the research, with a confidence level of 95%, causal factors have an effect of 0.705 on the main category (recruitment and retention of employees of health care centers), the main group. (Hiring and maintaining health). Central employees affect strategies with 0.379, intervening factors with 0.129, and contextual factors with 0.457 on strategies, and finally strategies with 0.849 on results.

#### **Discussion**

The purpose of this study was "to develop a structural equation model for human resource management in healthcare centers". To achieve this goal, the qualitative research method of grounded theory and the quantitative survey method with structural equations were used. In this regard, the employment and sustainability of human resources is one of the most important tasks of human resource management in healthcare centers. Human resource managers should make the employment of human workforces and their maintenance a priority and always keep up-to-date and efficient programs in mind to improve the quality of these two processes according to the needs of health and treatment centers. It is necessary to update human resource planning with a systematic review process and meet the needs of health care centers in the field of human resources.

Comparison of studies suggests that few well-documented studies have been conducted in the area of model development that simultaneously address both important processes of recruiting and retaining human resources, especially in health centers. In most studies, each of these processes and their dimensions and the factors affecting them has been studied separately quantitatively and qualitatively. However, all studies conducted in this regard have shown that both the recruitment and retention processes, which are even

necessary according to some studies, are related to the efficiency and effectiveness of human resources and the reduction of turnover of staffs in health centers. A review of various studies suggest that different factors can be considered as constructive dimensions of the process of recruiting and retaining human resources in health centers. As mentioned in the introduction of the second chapter, various domestic and foreign studies have examined the factors affecting the recruitment and retention of health center staff and have developed a conceptual and experimental model.

A number of models are presented as examples. In his model, factors such as individual factors, organizational factors, governmental factors, cultural factors, and environmental factors are emphasized in the field of factors influencing the recruitment and retention of human resources in health care centers. Other studies have pointed to factors affecting the attraction and retention of human resources. Motahhari Nejad, considers competencies such as knowledge, technical expertise, logic and problem solving, work ethics and responsibility, teamwork, communication, leadership, initiative and innovation and a comprehensive systemic view to be involved in attracting employees of health centers (6). Rajnbar & Shafizadeh, have referred to job security, non-discrimination, appropriate salaries and benefits, respect for staff of health centers, insurance services, various financial rewards, job promotion, supervisor and management style, organizational housing, loans, delegation and good colleagues as important factors in retaining staff of health centers (7). Tahmasebi et al., have emphasized on the factor of research atmosphere and in recruiting top talents and employment in educational and research health centers such as universities (8). Shams Ahmar et al., considered organizational justice as an important factor in retaining staff of health centers (9). Chandrasekara & Perera, have emphasized

on higher salaries and benefits, and higher education to in recruiting and retaining health center staff. Chandrasekara & Perera, found that there is a significant positive relationship between the methods of recruiting (10). It can be said that the desired components in the stated studies are in line with the declared items in the present research regarding the recruitment and retention of employees.

The main goal of this study about of strategic human resource management in health centers is to create strategic capabilities by ensuring the existence of skilled, committed and motivated staff in health centers. Strategic human resource management of health centers seeks to help organizations to achieve a competitive advantage by helping to establish performance-oriented, participation-oriented, control-oriented and commitment-oriented systems. Commitment-oriented human resource management in health centers is one of the approaches in strategic human resource management of health centers to gain a competitive advantage. These activities are divided into two parts, including management tasks (these are general tasks and some experts refer to them as elements or principles of health and management centers, which include human resource planning in the medium-term and long-term form, organization of the structure based on the combination of human resources, guiding human resources during the selection, training and empowerment processes, and controlling and evaluating the performance of health center staff (2).

Regarding the studies related to the topic of the present research, we can refer to the following articles that are consistent with our research, in research titled "The optimal talent management system in organizations, the infrastructure and its implementation requirements". Suggesting an optimal system for talent management and systems and requirements for its implementation using a heuristic approach. In response to

the first question of the article (the optimal talent management system and its subsystems), a plan was proposed using theoretical discussions and the results of the focus group meetings, and two development and retention systems with six related subsystems were predicted. In response to the second question, the requirements for the implementation of this system were addressed and instead of emphasizing only attracting talent management and then releasing them, the identification of this capital in health and treatment centers and ways to maintain and develop them empathized (11).

In a study entitled "A Study of Management Strategies for Recruiting, Empowering and Retaining Human Resources in the Oil Products Distribution Company of Miandoab Region", Hosseinzadeh & Bohluli, showed a positive and significant relationship between management strategies and recruiting, empowering and retaining human resources. The results also showed that it is the best strategy to recruitment is the strategy of improving selective methods, to empower the training strategy and to maintain the strategy of improving performance. In addition, the results showed that the training strategy is the most effective strategy for recruiting, empowering and retaining human resources (12).

In a study entitled "Talent management: Identifying and ranking the factors affecting the recruitment and retention of scientific talents", Tahmasebi et al., stated that recruiting and retaining talents is one of the first steps in talent management. According to the results, the research atmosphere has the highest impact on recruiting talent at the University of Tehran (8). Bogatova, showed that the most effective method of recruitment and selection was evaluated to be selection of university graduates and trainees in family companies. Furthermore, the best method to retain the staff of health centers was determined to be optimal training,

improving the payment system and paying attention to reducing the negative aspects of the job (13).

In a study entitled "Talent on demand? Talent management in the German and Irish subsidiaries of a US multinational corporation", Burbach & Royle, examined human resource management of health centers in American multinational companies in Germany and Ireland. Results revealed that the success and development of human capital management (recruitment and retention) depends on a combination of factors including support for senior management of health centers and participation of company shareholders, political exchanges and the ways of integrating human capital management of health centers with company's human resources information management (14). Burbach & Royle, emphasize on factors such as support of senior management of health centers and shareholder participation, political exchanges, and the way of integrating human capital management of health centers with human resource information management to retain human resources (14).

In the present study, the strategic management of human resources has been proposed as the only way for the success of healthcare centers in the new era. The findings of the exploratory factor analysis of Zarafshani et al., and colleagues have also shown that the factors affecting the retention of trainees include five factors: factors related to education and the school, organizational support, attention to trainee conditions, individual factors, and course characteristics are related (15), also the results of the research of Tavaklinejad et al., showed that among the cultural, organizational and governmental factors, organizational factors have the greatest impact on It has staff maintenance (16). In Mirkamali et al., study, the criteria for attracting and retaining human resources included three categories, which are: personal competence and abilities, belief,



moral and religious issues, and special privileges (17). It was stated in Mirzaee et al., study. Factors such as providing valid and relevant information during recruitment, delegating work based on merit, the existence of a clear career path, an effective evaluation system, and an effective payment system have an effect on the preservation and maintenance of human resources (18). The results of Tharenou, study have shown that outsourcing of multinational companies should focus on two general stages of human resource management, attracting capable candidates for job interviews and retaining selected personnel in companies (19). Zahedi & Hasanpour, stated in their research, employability is a concept that is proposed in this article to deal with the lack of job security in employment and it can replace job security to some extent (20).

### **Recommendations**

Paying more attention to determining the employability of people in health centers with the help of employment test, interview and fair selection

Human resources have been recruited from inside the health centers and not outside the health centers, and selection based on merit and recruitment both from inside and outside of these centers should be considered

By empowering and training, conditions should be provided so that human resources of these health centers can do their staff and executive duties simultaneously

By empowering and training, conditions should be provided so that human resources of these centers can be mentally prepared to be recruited at lower organizational levels after management courses.

Strengthening self-discipline in line with the human resource development programs of these health centers and considering effective mechanisms in this area

Paying special attention to knowledge and skill-based forces in line with human

resource development programs of these health centers

Familiarization with the issues of health centers and socializing the staff of new health centers

Management of legal and administrative barriers to staff development should be considered in line with the human resource development programs of these health centers.

### **Conclusion**

The extent to which the developed model for Hormozgan health centers can improve the human resource management of these health centers in practice depends on the level of application and knowledge of all dimensions and factors that the managers of this organization use this model in human resources management processes in health centers, especially recruitment and retention processes.

### **Authors' contribution**

Sara Tavakoli and Sanjar Salajegheh developed the study concept and design. Saeed Sayadi acquired the data. Masoud Pourkiani and Hojat Babaei analyzed and interpreted the data, and wrote the first draft of the manuscript. All authors contributed to the intellectual content, manuscript editing and read and approved the final manuscript.

### **Informed consent**

Questionnaires were filled with the participants' satisfaction and written consent was obtained from the participants in this study.

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### **Conflict of interest**

The authors declare that they have no conflict of interests.

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