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Examining the indices and the factors affecting agility of hospitals: Case study Shahid Rejaei Hospital)

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Abstract---In the everchanging world of today, the proper management and administration of the challenges faced by the organizations is of the key goals aiming to successfully deal with continuous, dynamic, and unpredictable environmental changes. Thus, an organization is known as agile that can have such management. The purpose of the study was to examine the indices and factors affecting the agility of hospitals in Shahid Rejaei Hospital. The study was exploratory-mixed carried out qualitatively (interview) and quantitatively (correlation), which was applied in terms of purpose, and survey method was used for data collection. Regarding this, Shahid Rejaei Hospital was selected as the population. SPSS and EXCEL software was used for statistical calculations. The results, in an applied way, formed other part of the paper by using various methods of descriptive and inferential statistics as analytical tables that tests the hypotheses. Finally, some suggestions and solutions were presented in form of summary and conclusion of the paper according to the results of statistical tests.

Keywords---agility, hospitals, Shahid Rejaei Hospital.

Introduction

The organizations need to abandon traditional management methods nowadays to keep up the pace with rapid changes in highly competitive markets, and, by creating dynamic partnerships, unite with each other and compete to meet the changing needs of the market and finally try to reach the win-win goal (Kamali, 2018). One of the techniques able to result in significant improvements in any organization is agility. Agility in medical centers is critical compared to other service centers because of the sensitivity of the health of the community because the use of this management technique can lead to the provision of higher quality services. Providing quality services in medical centers around the world has a prominent position because it is responsible for maintaining the health and life of the community. One can state that in recent years, agility management in medical centers in the world has been very popular as the need for society to have more modern medical centers has become more complex with the advent of technology. In the present era, information, and communication technology (ICT) and total quality management have been introduced in all service institutions and organs, and thus, it has created tangible quality benefits in these areas (Abdi, 2017). Using agility in the public sector can be a good arena for the growth and development of this concept. However, some people argue that because of the lack of competition and speed in the public sector, and in a word the lack of dynamism in the workplace and operations, the expression of agility in this sector is practically meaningless and irrelevant (Parsa et al., 2020). Supply chain management in the healthcare sector is very important compared to other industries given its effects on people's health. In the world's current economic state, where rational thinking must be based on the cost of product life, resources, and supply chain processes, it is essential that the supply chain is agile, to be able to function properly in the environment and society and lead to competitive advantage. Ali Akbari et al. (2019) state that medical centers, such as hospitals, are not only no exception to this, but are of great significance. In spite of all the advances of the present age, what can be seen

Theoretical basics of the study

Agility

The agility concept was first introduced in 1991 by the Coca Institute. Agility is defined as the ability to thrive in an environment of continuous and unpredictable change. Agility is a set of capabilities and competencies that lead to survival and growth of the organization in facing environments full of uncertainty (Valafer et al., 2018). To Sharifi and Zhang (1999), agility is the organization's ability to sense, perceive and predict the changes in the business environment.

Vokurka & Fliedner: Agility is the ability to produce a wide range of low-cost, high-quality products with short delivery times in different sizes, which is created for customers with unique characteristics.

Katayama and Binet: Agility refers to the relationship between the company and the market. Indeed, agility forms the base for developing competitiveness and business forecasting.

Christopher: Agility is defined as an organization's ability to respond quickly to changes in demand, both in volume and variety.

Mason Jones et al.: Agility refers to using market knowledge and virtual companies to take advantage of opportunities in fast-paced market conditions.

Toulon: Agility is the effective integration of supply chain and proximity and long-term relationship with customers and suppliers.

Vanhuk et al.: Agility is all about customer responsiveness and market turmoil and the special capabilities that are needed that can be reached by lean thinking.

Atiken et al.: Agility refers to the ability to detect demand, quick response, flexibly and operate simultaneously.

Stratton and Warburton: Innovative products and volatile demand show agile production.

In spite of the many definitions of the word agility, none of them contradict or negate each other. These definitions generally show the idea of "speed and change in the business environment." However, considering the novelty of the agility discussion, there are no one-size-fits-all definitions.

Experts' views on organizational agility

Agility from the perspective of Crocito Joseph

Crocito Joseph (2009) argues that advanced information and production technology results in production agility, and production agility brings organizational agility through reducing costs, increasing speed, and improving quality. According to the two, accountability and flexibility resulting from effective communication between leadership, employees, customers, and suppliers are closely related to agility. Organizational agility according to Turang Lane et al.

The goal of an agile organization is to meet the needs of customers and employees. Basically, such an organization has a set of capabilities to respond to changes in the business environment. Torang Lin et al. (2005) provide a conceptual model for agile organization based on a review of the comprehensive literature. In this model, the key driver of agility is change that can be seen mainly in customer needs, competitive criteria, market, technology, and social components. Moreover, an agile organization calls for a set of capabilities to deal with these changes, including flexibility, competence, responsiveness, and speed. Furthermore, it is necessary to reach the agility of the organization to review and enhance strategies, react to technologies, and work facilities. Regarding this, a variety of enablers are required to respond to the environment and its changing needs.

The view of Goldman, Nagel, and Preiss

According to Goldman, Nagel, and Preiss (1993), agility is using a combination of advanced and famous production technologies and procedures. In other words, agility has two-way adaptation to lean manufacturing, total quality management, material requirements planning, process reengineering, and employee empowerment. They argue that agile production aligns the full range of flexible production technologies with the lessons learned from the approaches of total

quality management, timely production, and lean manufacturing (Jafarnejad and Shahai, 2007). Goldman (1994) summarizes agility in three terms: strategic response, extensive changes, and the dominant system. In *Agile Competitors and Virtual Organizations*, Goldman et al. (1995) recommend that agility encompasses four interrelated principles: transferring value to customers, mastering change and uncertainty, and working together to increase competitiveness and creating a virtual organization (Jafarnejad and Shahai, 2007).

The view of Ramesh and Davidson (2007)

According to the twenty criteria of agility, Ramesh and Davidson (2007) came to the conclusion that agile production is a function of the flexible production system and the lean production system. They believe that the various definitions of agile production in the theoretical literature do not show a difference between them, as the basic premise of all of them is that agile production means the ability of manufacturing organizations to respond quickly to market needs. Therefore, agile production welcomes fundamental changes in the system, culture, and management styles of traditional production environments.

Model of Yusuf, Sarhadi and Gunaskaran

Yousef et al. (1999) in the light of the abundant literature, the definition for agility is: Successful use of competitive principles (speed, flexibility, innovation, quality, and profitability) by integrating renewable resources and best practices in an environment with Rich knowledge is called “agility” to provide common products and services in a changing market environment. This definition is different from other definitions for the following reasons recommended for agility: This definition introduces agility according to input, output, and process. Thus, one can state that in this definition, there is a kind of systemic view and perspective.

In this definition, there are three specific levels of agility: individual, organizational, and inter-organizational. Although the individual and organizational levels have already been introduced by Goldman et al. (1995), Yusuf et al. add the inter-organizational level to it in this definition. This definition includes four key concepts of agility, including competition according to key competencies, virtual organization, restructuring, and knowledge-based.

In an executive model, Yusuf et al. describe how to reach organizational agility. Based on this model, all the organizations require to identify and cultivate their core competencies to reach agility. These competencies identify what capabilities the organization uses in its body. Then the bottlenecks and hurdles on the way to respond to change, in other words, the elements preventing the organization from reaching the desired performance, are identified and mechanisms are designed to deal with them based on the characteristics of agility. These mechanisms have to enhance the performance of the organization and the competitive position of the organization, removing obstacles and bottlenecks at the same time.

Agile organization design according to Ambrose and Morilla

In a study, Christopher Ambrose and Diane Morella (2004) consider the design of an agile organization to help balance order and change in the business environment, as it allows managers and organizational officials to have more choices to better respond to changing demands, offer new services, meet customer expectations, and bring some competitive advantage to the organization. These two researchers consider the general principles of agile organization design to include the following:

Source-finding strategy: A set of decisions that define and integrate internal and external resources refer to this component. The organizations will first identify the services that require to be provided in the organization and then delegate responsibility to individuals.

Resource management: This component has an effective role in employing people, skills and competencies in the right place and will help the organization in the correct allocation of resources.

Competencies: Anything that identifies the best organizational performance is referred to as competency. In the past, traditional intelligence agencies have relied on technical skills, but as we move toward agility, much attention must be paid to competencies.

Leadership: In agile organizations, leadership is less focused on grammatical control and dictatorship, and more on preparation, leadership, influence, delegation, and persuasion.

Process-orientation: Here, the focus is on how the organization works. Overall, all processes have four key characteristics: observable, measurable, reproducible, and consistent.

Structuring: An agile organization has a flexible and decentralized structure.

Readiness for change: This component enables organizations to seize opportunities (business agility) and get rid of difficulties (organizational mutations).

Sharifi and Zhang model

In that case, agility has to be taken seriously by everyone. Agility capabilities are the second part of this model that embody the basic headings of the capabilities needed to respond to change, and at the end of the model, there are agility enablers that act as tools to achieve agility capabilities. However, these enablers can be found in four significant areas of the production and service environment: organization, staff, technology, and innovation.

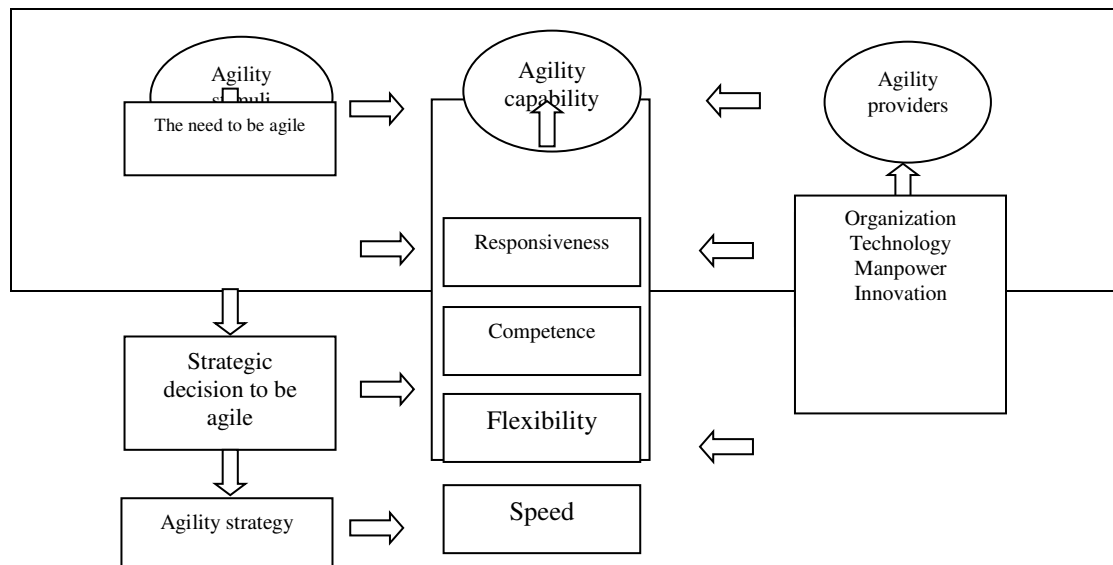


Figure 1: The conceptual model of achieving agility (Sharifi and Zhang, 2001)

One of the most authoritative studies regarding the agility is the one carried out by Sharifi and Zhang (2001). Based on this study, the two have presented a conceptual model of organizational agility, including: tools of organizational agility, reinforcers, and agility drivers. An organization can respond the changes in the environment. Agile organizations are more concerned about changing and uncertainty and unpredictability of the environment, so they attempt to indicate the right action in this state. Thus, an agile organization requires the existing potential capacities and adaptation to face these changes and uncertainty in the environment.

The results of agility for the organization

Agility enhances the organization ability to offer high quality products and services and thus becomes a key element for the organization effectiveness. Many organizations turn to approaches like virtual organization and virtual team to improve organizational agility and develop globally. Organizational agility might seem to integrate processes, members, and organizational characteristics with advanced technologies. Agility demands the organization to accelerate the integration of technology, staff, and management with the communication infrastructure to respond to the changing needs of customers in a market environment constantly changing and unpredictable. Overall, the benefits of organizational agility can be summarized as follows:

- Faster advancement of the organization to work goals
- Better serving, lower prices, and the durability of the organization
- Gaining value from IT investment
- Reducing the dedicated budget to IT
- Establishing the coordination needed between IT service providers
- The ability of the organization to change processes and enhance work operations

- Faster response of the organization to customer needs, increasing employee satisfaction
- The organization responds well to changes
- Employee skills are significantly developed
- Labor values increase
- Organizational control improves significantly
- Improving the structure of organizational processes
- Increasing the efficiency of the organization because of reducing costs
- Getting technological advantages
- Improving cost control

Overall, agile organization could deduce production costs and increase market share, satisfy customer needs, prepare for the introduction of a new product, evaluate, and estimate activities without value added and increase competition. Thus, agile organization has turned into a successful strategy in competitive markets with rapidly changing customer needs (Atkinson & Moffat, 2005)

The necessities of developing agility in hospitals

The hospital is usually considered as a complex system in a dynamic environment with a wide range of clients and often different services. Social and demographic changes, rapid advances, professional interests, as well as changes in social demand and new theories about health care management and organization have all affected modern hospitals. This feature brings about an agile environment that needs the desire to respond quickly and appropriately to the unpredictable environment. The agility of a hospital shows the responsiveness of the hospital in the face of internal and external changes, and agile hospitals can compete with other hospitals in providing services to patients. Agility cannot result in productivity without employing skilled and knowledgeable employees. It is argued in many cases that employee agility could offer a wide range of benefits like quality improvement, better customer service, high learning speed, cost-effectiveness (saving) in depth and surface. Hiring agile employees in an agile production environment and using flexible technology and infrastructure in supporting change and recognizing demand is very effective and vital. It has to be noted that the main and the most essential elements in hospitals agility development can be mentioned as follows:

- Reducing time, accommodation costs, training space and medical care
- Enhancing access and medical care for rural and disadvantaged areas
- Better access to the doctors
- Reducing the transfer of patients to medical centers
- Applying the experiences of doctors and specialists in other parts of the world
- Quick access to the physician for consultation and examination
- Reducing employee fatigue
- Faster patient recovery

The main features of agile hospital that distinguish it from other hospitals are: 1) adaptability 2) responsiveness, and 3) speed of action.

Literature

Winterab (2017) states that considering the limited resources in most hospitals, it would be useful to provide a good understanding of how and to what extent agile algorithms work, how and to what extent they can be used in the healthcare sector. Jan (2018) states that medical centers, especially hospitals try to use a fixed tool to solve very complex problems to reduce costs, quality of treatment for patients in good conditions and to enhance quality levels.

Moghaddam and Nekouei (2011) state that technical quality means the correct diagnosis of diseases and the treatment process in the field of health services. However, task quality is associated with the process and way services are provided to patients and clients that can be reached by using agile models. The significant point in this discussion is that because of the lack of information of patients about technical and specialized quality, what patients always comment on is the quality of duty. Hence, the need to pay attention to this becomes more and more clear.

Soltani et al. (2015) have written a paper aimed at determining the factors affecting agility in Shahroud University of Medical Sciences. In this cross-sectional study in 2014, 153 staff members were randomly examined and completed a web-based questionnaire containing 100 questions on their own. Data was analyzed using SmartPLS and SPSS18. The results show that 79 (51.6%) people were women and 57 (37.3%) had less than 10 years of work experience. There were no significant differences between the mean of all indices of responsiveness, speed, competence, flexibility, and agility in the categories of gender, age, work experience and education ($P > 0.05$). However, there was a significant difference in the indices of the responses achieved ($P = 0.002$), achieved speed ($P=0.002$), achieved flexibility ($P=0.022$), achieved agility ($P=0.009$) at different organizational levels. Moreover, for people with various occupations, there were significant differences in the achieved speed ($P=0.031$), achieved competence ($P=0.018$), achieved flexibility ($P = 0.043$), achieved agility ($P=0.016$). In the final model, three factors of competence, responsiveness and speed were involved in agility in Shahroud University of Medical Sciences.

Nazari and Khosravi (2016) indicated that communication skills have a linear and positive effect on quantum management, and communication skills are effective in organizational agility. Goals are the first issue important in the agility of the organization and managers should formulate the strategies of the organization in line with the goals. The next step is for the organization to identify the resources it needs. The most valuable resources of any organization are the human resources of that organization, as the longer they live, the higher their experiences and the more valuable and useful they will be for the organization. Other resources of the organization outside the organization are its customers that every organization needs to have customer experience management with it (Amirnejad et al., 2014).

In a paper entitled “Examining the factors affecting supply chain agility and creating a competitive advantage in public hospitals in Ilam,” Ali Akbari et al. (2017) examined the agility in public hospitals in Ilam. The study findings indicated that seven aspects of computer-based technologies, flexibility, relationships with suppliers, application of new technologies, partnerships, market sensitivity and demand response, affect the supply chain agility of hospitals and public hospitals in Ilam. In the three aspects of durability, retention, and opportunism, they have a comparative competitive advantage, but in the field of unique competencies, they do not have a competitive advantage.

In a study entitled “The factors affecting the agility supply chain of Iranian hospitals,” Abdi et al. (2016) examined the factors affecting the agility supply chain. The agility of a hospital indicates the responsiveness of the hospital in the face of internal and external changes, and agile hospitals can compete with other hospitals in providing services to patients. Thus, the study was conducted to determine the effective factors of agility supply chain in Iranian hospitals. The findings indicated that the development of staff skills ($p = 0.008$), using IT ($p = 0.008$), process integration ($p = 0.001$), sensitivity and market responsiveness ($p = 0.000$) proper planning ($p = 0.004$), introducing new service ($p = 0.008$), reduction of costs ($p = 0.000$), patient satisfaction ($p = 0.005$) and the quality of services ($p = 0.005$) in the agility of public hospitals Iran is effective and the introduction of the new service has gained the highest rank and the development of staff skills the lowest. They concluded that the quick response to the growing and changing needs of the customer is a prerequisite for competitive advantage for hospitals that could increase agility capabilities by developing new strategies and improving infrastructure.

Rahimnia et al. (2011) stated that for agility, medical knowledge and experience of medical service providers are among the most important factors in responding to the different needs of patients. Regarding this, the hospitals are very interested in hiring the best medical human resources. Hiring labor for small hospitals is important as the long distance between these hospitals and their city does not prevent the recruitment of skilled labor. Nonetheless, the offer of attractive options by these medical centers has made this organization different from other organizations. Hiring a skilled labor is not only one way to enhance agility, but also cooperation between various hospitals is essential to exchange new findings and leverage their competence in the health sector according to one of the interviewees. In this study, these collaborations have been considered possible by the continuation of joint meetings between various hospitals.

Azar et al. (2010) presented a comprehensive model for the agility of service centers, with extensive study of the literature. As a result of this study and the interviews with experts, the following agility factors were identified:

Development of employee skills, application of information technology, process integration, market sensitivity and responsiveness, proportional planning, flexibility, cost reduction, and customer satisfaction. In a study on the agility of hospitals in Isfahan in 2009, Yar Mohammadian et al. (2011) stated that the level of agility of private hospitals is higher than public hospitals and the level of agility of public hospitals is slightly higher than average. They stated that the agility of a

hospital shows the responsiveness of the hospital in the face of internal and external changes.

As is clear from previous studies, the issue raised in this thesis is a special topic with a special approach. Based on the studies on the literature, the research is not such as to show that it has worked on such a subject. Hence, one can state that the present study is a complete innovation in this regard. The purpose of the study is to determine the components and dimensions of agility proper to the research community by examining models of agility and a step in improving the quality of services of these organizations that have not been studied with this range of agility capabilities. Overall, the distinguishing feature of the study is using a model to identify and measure the components and indices of agility by considering the study location. An overview of Rejaei Hospital in Karaj showed that no studies have been carried out to focus on improving the quality of service.

Methods

Overall, study methods can be divided according to two criteria: A) the purpose of the study and b) data collection. Accordingly, the study was “applied” in terms of purpose and “descriptive-analytical” in terms of data collection method with exploratory mixed method type. Exploratory mixed method is of the types of scientific studies used to provide a model to represent the phenomenon examined. This method can be used in a scientific study that looks for pattern design and modeling. In the qualitative part of the information in this study is library studies and interviews. Library resources, articles, books, journals and the internet were used for data collection on the study basics and literature. Delphi interviews and open questionnaires were used to collect information in the field of practice. In the second phase of the study, the researcher collects quantitative data from experts using the mixed exploratory method. At this step, we collected and analyzed the data while determining the main variables and compiling the quantitative data collection tool (questionnaire) and selecting a random sample from among the experts of Shahid Rajaei Hospital. In this chapter, we intended to generalize the results according to the results obtained. The population of the study included experts, university professors and physicians, all of whom are experts. Experts include academic experts and senior and middle managers of medical sciences and physicians of Shahid Rajaei Hospital about each of the aspects of the study.

Results

In this section, an interview request was sent to 30 nursing specialists, and so on at Shahid Rajaei Hospital to receive the opinions of experts on the indices of each aspect. They were asked to contact their other colleagues who can cooperate with us regarding the study and introduce them to us. Finally, 13 people accepted the invitation of the research group and participated in the interview session. The interview protocol was prepared prior to the meeting and the necessary questions and explanations were sent to the candidates before the meeting to prepare the pre-interviewee. After the interview session, the recorded contents of the interview were converted into text and coded. It has to be noted that the interviews have progressed to the point of theoretical saturation. Ultimately, the data were used

regularly and for analysis with the achievement of theoretical saturation. Theoretical saturation was reached in the interview with the 10th expert, but we continued the interview with the next 2 experts to be surer. Ultimately, it was found that theoretical saturation had been reached with the 10th expert.

Regarding demographic information, it has to be noted that eight men and five women participated in the study. The average age of experts is 41 years. The experts were doctors, nurses and managers of Shahid Rajaei Hospital, whose average work experience was 17 years. On the other hand, in the qualitative part of the information in the study, including the library studies that we talked about in detail in the second chapter was used. Library resources, papers, books, journals, and the internet were used for data collection on the study basics and literature.

Considering the literature review and research background, related models and main indices of organizational agility, the initial theoretical conceptual model of research affected by the views of management theorists, interviews, and expert opinions and finally the researcher's thesis. Finally, the researcher's theories about the agility of hospitals were assumed as the main component of the researcher and the main dimensions and indices:

Table 1: the Indices and the Factors Affecting Agility of Hospitals

Component	Main dimensions	Indices	References
Agility	Organizational factors	Fast response	Research Experts, Chank and Tong (2012), Haghighi et al. (2018), Plunka (1997), Gunaskaran (1999), Go et al. (2001), Zain et al., 2004, Hilgersberg et al. (2005)
		Staff training	
		Agile problem solving	
		Responding to customer needs	
		Responding to changing conditions	
		Feeling the need for agility (culture building)	
	Flexible organization structure		
	Strategic factors	Having an advanced response strategy	Research Experts, Sharp (2012), Rashidi et al. (2018), Research Experts, Irvani and Krishnamirti (2007), Zein et al., 2004, Ambrose and Morella (2004), Ramesh and Davidson (2007)
		Fast adaptation to change, new ideas and new technology	
		Support and encouragement	
		Readiness for change	
		Readiness to adapt to events and trends	
Eliminating value-			

		added activities	
		Innovation	
		Resource fluidity (resource flexibility)	
	Technological factors	Using modern technology	Research Experts, Zareedini and Yousefi (2012), Jafarnejad and Shehai (2007), Kumar et al., (2016), Ramesh and Davidson (2007), Hilgersberg et al. (2005), Turang Lin et al. (2005)
		Familiarity with technology	
		Speed in obtaining the technology required for business process changes	
		Data retrieval and data processing	
		Quick access to information	
	Human Factors	Multi-skilled and multi-specialized staff	
		Staff fluent in multi languages	
		The existence of knowledge in the working group	
		Speed in developing new skills and competencies	
		Speed in acquiring the skills required for business process changes	
		Employees at will, in independent decision-making	
		Speed of delivery and completion of missions	
		Cohesion and commitment	
		Vocational and specialized training	
		Reduce employee fatigue	
		Applying the experiences of doctors and specialists in other parts of the world	

		Better access to doctors	
		Sympathy	

Part two: Quantitative study

In this section, we analyzed the data extracted from the dissertation using statistical software. It has to be noted that special letters were used to identify in data analysis. These letters are according to the following table.

Table 2: analysis of data extracted from the dissertation using statistical software

Component	Main dimensions	Indices	Letters
Making agile	Organizational factors	Fast response	A 1
		Staff training	A 2
		Agile problem solving	A 3
		Responding to customer needs	A 4
		Responding to changing conditions	A 5
		Feeling the need for agility (culture building)	A 6
		Flexible organization structure	A 7
	Strategic factors	Have an advanced response strategy	B 1
		Fast adaptation to change, new ideas and new technology	B 2
		Support and encouragement	B 3
		Readiness for change	B 4
		Readiness to adapt to events and trends	B 5
		Eliminating value-added activities	B 6
		Innovation	B 7
	Technological factors	Resource fluidity (resource flexibility)	B 8
		Using modern technology	C1
		Familiarity with technology	C 2
		Speed in obtaining the technology needed for business process changes	C 3
		Data retrieval and data processing	C 4
	Human Factors	Quick access to information	C 5
		Multi-skilled and multi-specialized staff	D 1
		Staff fluent in multi languages	D 2
		The existence of knowledge in the working group	D 3
		Speed in developing new skills and competencies	D 4
		Speed in acquiring the skills	D 5

	required for business process changes	
	Employees at will, in independent decision-making	D 6
	Speed of delivery and completion of missions	D 7
	Cohesion and commitment	D 8
	Vocational and specialized training	D 9
	Reduce employee fatigue	D 10
	Applying the experiences of doctors and specialists in other parts of the world	D 11
	Better access to doctors	D 12
	Sympathy	D 13

Summary of demographic information

After completing the qualitative part, a researcher-made questionnaire was prepared using the data of the qualitative part and distributed among the staff of Shahid Rajaei Hospital. Then 210 questionnaires were completed and 210 people answered the question about “gender”. Moreover, 207 people answered the “age” question and three left it unanswered. Finally, 205 people answered the question regarding “service history” and “education level”, and five people left it unanswered.

Table 3: number of respondents to the demographic information

Sample size: 210	Gender	Age	Service history	Education level
The number of valid answers	210	207	205	205
Unanswered	0	3	5	5

Results and Significance

This section deals with the relationships between variables. Indeed, the relationships were examined. Structural model fitting was performed based on t-statistic. These coefficients must be greater than 1.96 to confirm their significance at the 95% confidence level. The degree of relationship between variables was determined by correlation. The correlation values are presented in the table.

Table 4: the results of correlation values based on t-statistic

Indices	t statistics	Sig.	Results
Fast response	6.727	0.000	confirmed
Staff training	12.342	0.000	confirmed
Agile problem solving	19.110	0.000	confirmed
Responding to customer needs	7.390	0.000	confirmed
Responding to changing conditions	6.803	0.000	confirmed
Feeling the need for agility (culture)	26.223	0.000	confirmed

Indices	t statistics	Sig.	Results
building)			
Flexible organization structure	19.324	0.000	confirmed
Having an advanced response strategy	8.426	0.000	confirmed
Fast adaptation to change, new ideas and new technology	9.896	0.000	confirmed
Support and encouragement	12.551	0.000	confirmed
Readiness for change	9.770	0.000	confirmed
Readiness to adapt to events and trends	16.777	0.000	confirmed
Eliminating value-added activities	27.491	0.000	confirmed
Innovation	17.543	0.000	confirmed
Resource fluidity (resource flexibility)	9.577	0.000	confirmed
Using modern technology	25.681	0.000	confirmed
Familiarity with technology	20.946	0.000	confirmed
Speed in obtaining the technology required for business process changes	2.390	0.000	confirmed
Data retrieval and data processing	18.817	0.000	confirmed
Quick access to information	12.073	0.000	confirmed
Multi-skilled and multi-specialized staff	12.581	0.000	confirmed
Staff fluent in multi languages	15.577	0.000	confirmed
The existence of knowledge in the working group	3.681	0.000	confirmed
Speed in developing new skills and competencies	7.946	0.000	confirmed
Speed in acquiring the skills required for business process changes	6.390	0.000	confirmed
Employees at will, in independent decision-making	15.577	0.000	confirmed
Speed of delivery and completion of missions	8.681	0.000	confirmed
Cohesion and commitment	20.946	0.000	confirmed
Vocational and specialized training	41.390	0.000	confirmed
Reduce employee fatigue	6.577	0.000	confirmed
Applying the experiences of doctors and specialists in other parts of the world	13.681	0.000	confirmed
Better access to doctors	8.465	0.000	confirmed
Sympathy	11.390	0.000	confirmed

According to the above table, the values of t-statistic in the studied tests are greater than 1.96 (significance levels less than 0.05). Thus, these relationships are significant.

Discussion and Conclusion

With the start of the twentieth century, service organizations witnessed dramatic changes around them. The intensity of these changes has been so great that it

has faced service organizations with new challenges and the lack of attention to these challenges has severely affected the survival and success of organizations. The agility of a hospital shows the responsiveness of the hospital in the face of internal and external changes, and agile hospitals can compete with other hospitals in providing services to patients. Agility is the effective response to changing and unpredictable environments and the use of those changes as opportunities for organizational development. Moreover, if the hospitals are designed to be agile, they will be able to compete with other hospitals and provide appropriate services to patients. Considering the results of the study, agile hospital has become a successful strategy in competitive markets by responding to rapid changes in patient needs. Furthermore, the sooner the work of patients and patient companions is taken care of, the more the patient and his companions will be satisfied with a positive effect on the agility of the hospital.

Considering the results of the study, rapid response, staff training, agile problem solving, responding to customer needs, responding to changing conditions, feeling the need for agility (culture building), flexible organizational structure, having an advanced response strategy, rapid adaptation to change, new ideas and new technology, support and encouragement, readiness for change, readiness to adapt to events and trends, elimination of value-added void activities, innovation, resource fluidity (resource flexibility), using state-of-the-art technology, familiarity with technology, speed in the acquisition of technologies needed for business process changes, data acquisition and processing, rapid access to information, multi-skilled and multi-specialized staff, staff fluent in several languages, knowledge in the workgroup, speed in developing new skills and competencies, speed in acquiring the skills needed for business process changes, employees at will, independent decision makers, speed of delivery and accomplishing missions, cohesion and commitment, vocational and specialized training, reduction of staff fatigue, using the experiences of physicians and specialists in elsewhere in the world, better access to physicians, empathy are essential for the advantages of agility for hospitals is that hospitals have to develop new strategies and improve their infrastructure.

Consistency of the results with previous studies

According to the results of the study, some studies concluded that hospital agility means the difference between life and death, which points to the significance of the results of this study. In a study on agility process criteria, Chank and Tang (2012) concluded that the factors of productivity development are an important factor in creating agility in the organization. Thus, all these researches are in line with the results obtained from this study. In their study entitled "Determining the factors affecting agility Shahroud University of Medical Sciences," Soltani et al. (2015) concluded the factors to be responsiveness achieved, achieved speed, achieved flexibility, achieved agility significant differences at different organizational levels in the final model. Moreover, there was a significant difference in the indices of achieved speed, achieved competence, achieved flexibility, achieved agility, competency, responsiveness, and speed in the agility of Shahroud University of Medical Sciences for people with various occupations. These factors are in line with the present study. Ziaei et al. (2012) consider intense competition in the business environment, increasing customer expectations, globalization, cultural and social issues, limited manpower,

information technology, innovation and initiative and change. These cases are consistent with our study. In a study, Lin et al. the indices of organizational agility were called agile organizational management, agile product or service design, and the production and manufacture of a new product. The results of Haghighi et al. (2018), Plonka (1997), Gunaskaran (1999), Brou et al. (2001), Zein et al., (2004), Hilgersberg et al. (2005), Sharp (2012), Rashidi et al. (2018), Irvani and Krishnamirti (2007), Zein et al., (2004), Ambrose and Morilla (2004), Ramesh and Davidson (2007), Zareedini and Yousefi (2012), Jafarnejad and Shahai (2007), Kumar et al., (2016), Ramesh and Davidson (2007), Hilgersberg et al. (2005), Turang Lin et al. (2005), Raven and Nembhard (2010), Ramesh and Davidson (2007), Zaraedini and Yousefi (2012), Sharifi and Zhang (2001), Kiani (2010), Shahriari (2011), Rashidi et al. (2018), Tavakoli et al. (2019) in various indices and dimensions of agility are in line with the present study and also confirm the results of the present study.

Suggestions

Practical suggestions based on the results

Based on the final model drawn in the present study, one must plan for each of the effective factors and improve them in Rajaei Hospital so that one can finally increase the “agility” in this hospital. The suggestions obtained are based on the results of the performed tests and the presented model of the results of this study. Hence, in this regard, the following are recommended:

- We need to have a plan for each of the indices obtained in the model. Each of these indices is important to us and can be a big step towards reaching agility.
- A deep look at the indices of staff training and organizational culture, as agile organizational culture has to be institutionalized in the organization that will be done only by training.
- Support and encouragement regarding change
- Preparing human resources to adapt to events and trends
- Inclination towards technology
- Doing affairs as central-oriented
- Reducing unnecessary and unreasonable work processes
- Encouraging human resources and reducing their fatigue
- Assessing the quality of work life

Suggestions

Finally, the following is suggested to researchers for future studies:

- Prioritizing and providing solutions for indices of increasing hospital agility
- Future studies on hospital agility
- Obstacles and problems facing agility in Iranian hospitals
- A comparative study of agility assessment of Iranian and Turkish hospitals

Limitations

The concept of attitude refers to the general set of prejudices, thoughts, judgments, and opinions on any subject. Perceptions are not clear unless there is a particular motivation to express them, or in other words, when they are questioned, they manifest as expression or behavior. However, attitude cannot be measured by a question (Irannejad Parizi, 2006). As thoughts do not necessarily show themselves in action, they are not expressed.

Generalization limitation

Two issues reduce the generalizability of the results:

1. The existence of intervening variables: In the research process, intervening variables may have affected the relationships, but hidden from the researcher's view
2. Lack of access to more case studies to increase the generalization of results

Difficulty in data collection from various companies

As most humanities studies in Third World countries, the data needed for this research could be collected with difficulty and time consuming. Data collection from experts including doctors, nurses and managers of Shahid Rajaei Hospital was very difficult.

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