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Original Research

Application of Knowledge Management Components from the Faculty Members' Perspective at Iran University of Medical Sciences Research Centers

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Abstract

Knowledge management is critical for universities and research institutes to improve their operations and activities. The study aimed to investigate knowledge management components in Iran University of Medical Sciences research centers from the faculty members' perspective. The sample size for the present study was generated using a simple random approach and Cochran's formula. The sample size was 245 out of 673 associate faculty members in affiliated research centers of the Iran University of Medical Sciences. The research instrument was the Fong and Choi knowledge management standard questionnaire. Following data collection, SPSS software version 23 was used to analyze the data using descriptive statistics and Pearson correlation tests. From the participant's perspective, the results indicated that the status of knowledge acquisition components was relatively good, with an average of 3.26, knowledge creation at 3.42, knowledge storage at 3.19, knowledge distribution at 3.13, knowledge application at 3.34, and knowledge retention at 3.24. According to respondents, there was an inverse statistical relationship between knowledge generation and application components and the research ranking of research centers and a direct statistical relationship between knowledge storage and retention (P-value < 0.05). There was no correlation between knowledge acquisition and distribution and the research ranking of the centers (P-value > 0.05). According to the findings, knowledge management components were applied effectively in research institutions affiliated with the Iran University of Medical Sciences. As a result, planning and strategies at research institutions and universities are required to raise this level to the desired level.

Keywords: Knowledge Management, Components, Research Centers, Iran University of Medical Sciences.

Introduction

Knowledge is the most valuable asset of today's manufacturing and service firms. (Ansari, Rahmany Youshanlouei, Rahmani, Pasbani, & Asgari, 2013). A new field called knowledge management emerged to improve knowledge processes and the link between the organization's and knowledge management strategy in providing the proper knowledge at the right time for the right person to maintain the advantage—competitive organizations assist (Abbaspour, Kianfar, Nili Ahmadabadi, Rahimiyan & Momeni, 2018; Nonaka & Takeuchi, 1995). Knowledge management entails identifying and analyzing existing and required knowledge assets and procedures associated with knowledge capital and planning and controlling their development (Farahani, 2009)

Additionally, knowledge management can define creating, acquiring, analyzing, retaining, and disseminating knowledge within an organization to accomplish goals (O'Reilly & Knight, 2007). In other words, knowledge management is extracting value from intangible assets (Kheirandish, Toori & Havasi, 2017). Knowledge management is a critical component of knowledge-based organizations, which rely heavily on exchanging experiences and knowledge. (HajKarimi & Bathaee, 2016) When knowledge and knowledge management tools are recognized and used effectively, they can considerably contribute to an organization's success, and mutually beneficial and synergistic contact is established among them. (Asgharzadeh & Gharae Poor, 2015)

As the country's primary institutions of higher education, universities are the main centers of knowledge creation and demand planning in knowledge management (Ramezani & Salimi, 2016). There is no exception to this regulation for university-affiliated research centers. Because these centers have a lot of projects and a lot of experience and knowledge, they need to set up a system to help them keep track of and apply their past projects, figure out what new knowledge they need to learn, and use knowledge repositories to share as much knowledge as possible. This system will help the organization and bring research results to a broader audience (Ahmadvand, Hosseini Banharanchi, Moghan & Nouri, 2016). Numerous researches have been conducted on knowledge management techniques and their implementation in various organizations. Knowledge management processes in a service organization were investigated in a study, and it was discovered that knowledge management approaches were used at a modest rate (Ramezani & Salimi, 2016). In another study, the pillars of knowledge management were studied from the perspective of Ahvaz Jundishapur University department managers. Only the factor of knowledge generation was determined to be relatively unsuitable.

Nonetheless, knowledge involvement, dissemination, application, and evaluation characteristics were all adequate (Khorramshad & Adani, 2009) Another study that investigated the application of knowledge management among Urmia University faculty members discovered that knowledge management at the university level is lower than average from the perspective of faculty members (DalaiMilan & Fereiduni, 2014). A study on knowledge management among library staff at Isfahan University of Medical Sciences revealed that creating and applying knowledge was above average, while knowledge storage and dissemination was below average (Hosseinzade, Shaabani & Siadat, 2012).

Additionally, a study examining the knowledge management functions of partner universities and their evolution at two universities in China discovered that partner universities' knowledge management functions include knowledge transfer, knowledge creation, and entrepreneurial knowledge services. These roles are becoming more prevalent. Simultaneously

with the advancement of the university (Chen, Xu & Zhai, 2019). According to another study, professors evaluated the state of knowledge sharing in three key areas: teaching, scholarship, and learning and comprehension of knowledge management culture (Conrad, Dierberger & Isaacson, 2019). Another study assessed knowledge management performance in Jordanian universities and its relationship with job competence from the perspective of faculty members. The results showed that the environment in Jordanian universities is moderate regarding setting up and keeping track of knowledge management and retention. There is a link between knowledge management and job empowerment (Hatamleh, Al-Zoubi & Darawsheh, 2017).

Due to a lack of appropriate tools for successfully implementing knowledge management, this type of investment appears to be an additional expenditure by senior executives. Thus, organizations should foster knowledge exchange, transfer, and engagement among their members, establish a platform, and identify knowledge management technologies for implementing knowledge management processes (Raisinghani, Bekele, Idemudia & Nakarmi, 2016).

From an information management perspective, research activities and knowledge management are relevant to research communities (Ermine, 2010; Gaines & Shaw, 1995) as well as completed or ongoing initiatives; (Barthès & Tacla, 2002). Thus, knowledge management in research centers is viewed as a tool for increasing the productivity of knowledge generation or innovation (Hasan, Machado, Tsukamoto & Umemoto, 2006; Suh, Derick Sohn & Yeon Kwak, 2004). Its impact on research centers is extensively documented (Frederiksen, Hemlin & Husted, 2004). Due to the extensive literature analysis and research conducted in Iran on knowledge management, less emphasis has been made on applying knowledge management and its implementation in knowledge-based organizations such as university-affiliated research centers. This study aimed to investigate the application of knowledge management components from the faculty members' perspective at the Iran University of Medical Sciences research centers.

Materials and Methods

This cross-sectional study followed a descriptive-analytical applied approach. The statistical population included six hundred seventy-three faculty members of Iran University of Medical Sciences research centers. Using a simple random Cochran algorithm, the sample size was determined using 245 participants. The inclusion criteria were being a full-time or part-time faculty member of the Iran University of Medical Sciences research centers and consenting to cooperate. The data collection tool is the 42-question Fong and Choi knowledge management questionnaire (Fong & Choi, 2009), which Shokrallahi and Karimi (2016) previously employed in Persian. This questionnaire is divided into six sections: knowledge acquisition (questions one–six), knowledge invention (questions seven–12), knowledge storage (questions 13–23), knowledge dissemination(questions 24–34), knowledge application (questions 35–37), and knowledge retention(questions 38-42). The items were examined using a five-point Likert scale, each with a value between five and one. Shokralahi and Karimi evaluated the questionnaire's reliability and determined it had a Cronbach's alpha of 0.79 (Shokrollahi & Karimi, 2016). The questionnaire was distributed to several famous faculty members and subject specialists to assess the questionnaire's face and content validity.

Respondents were assured that their information would be kept confidential without mentioning their names and that the obtained results would be used solely for research purposes under ethical guidelines. During the field phase of the current investigation, the link to the

prepared questionnaire was emailed to the sample. Following data collection, the data were analyzed using SPSS software version 23 using descriptive statistics such as mean, standard deviation, Pearson correlation test, and the Nanley spectrum for views and level of desirability.

Results

There were 97 females and 148 males among the 245 participants. The majority of participants (28.2 percent) were 51 and older. Regarding academic rank, 119 were assistant professors, 72 were associate professors, and 54 were full professors, of which 171 were instructional faculty members and 74 were research faculty members. Table 1 displays the mean and standard deviation of the views of fellow faculty members in research centers on applying knowledge management components.

Table 1

Faculty Members' Perspectives on the Deployment of Knowledge Management Components in Research Centers Associated with the Iran University of Medical Sciences

Component	View	Mean	SD
Knowledge Acquisition	Certain employees in the workplace are in charge of obtaining knowledge from outside sources.	3.02	1.13
	My performance is contingent upon the dissemination of novel knowledge beyond the company.	3.62	0.99
	Experienced staff is hired from outside the organization.	2.99	1.06
	Job rotation is encouraged in my workplace.	2.85	1.08
	Experienced and retired employees are invited to register their knowledge and experience.	2.99	1.14
	Employees learn new experiences after completing projects.	4.07	0.74
	Total number	3.26	0.58
Knowledge Creation	Employees are encouraged to come up with new ways of doing tasks.	3.45	0.91
	Job-related suggestions are encouraged in the organization.	3.46	1.17
	Knowledge is developed through organizational experiences.	3.83	0.87
	Employees are encouraged to suggest improvements to existing processes.	3.38	1.15
	Employees are encouraged to analyze success factors to enrich their knowledge.	3.35	1.09
	Employees are encouraged to examine their past mistakes to develop knowledge.	3.08	1.02
	Total number	3.42	0.86
Knowledge Retention	Data and information are selected and organized before being stored in the workplace.	2.96	0.96
	Electronic tools are used to archive knowledge in the workplace (non-printed version).	3.70	0.93
	Knowledge is archived on paper (print) at the workplace.	2.75	0.97
	In this organization, knowledge, and information are stored in individuals' memory (brain).	2.40	1.12
	In this organization, knowledge and information are kept in clients' files.	3.06	0.98

Component	View	Mean	SD
	Information and knowledge in this organization have a regular procedure.	3.24	0.90
	Documents such as work regulations, work practices, and instructions are used to archive knowledge.	3.46	0.78
	Access to confidential and sensitive information in the workplace is limited.	3.42	0.76
	Access to some information is recorded.	3.33	0.81
	Employees know where to get the knowledge they need.	3.28	0.83
	Employees know from whom to get the knowledge they need.	3.49	0.78
	Total	3.19	0.43
Knowledge Dissemination	The experienced staff at work are encouraged to guide new and inexperienced staff.	3.31	1.08
	The knowledge gained from various projects is available to everyone in the workplace.	3.22	1.15
	Knowledge is transmitted through electronic tools in the workplace.	3.51	1.01
	Knowledge and information are disseminated through documents in the workplace.	2.93	1.05
	Knowledge is shared through regular contact with coworkers (in the water house, at lunch, in the hallway, etc.)	3.36	1.03
	Knowledge is only transmitted face to face.	2.67	1.04
	Employees who share their knowledge with others are recognized and rewarded.	2.64	1.05
	The office is arranged so that employees are encouraged to share knowledge.	2.74	1.14
	Knowledge sharing in the workplace is a measure of employee performance.	2.67	1.12
	Remote access to work databases (through the Internet, a network, or other means) is offered.	3.82	0.80
	Specific projects are assigned to related professional staff.	3.56	0.95
	Total Number	3.13	0.67
Knowledge Application	People use knowledge to solve most of the problems they encounter in the workplace.	3.38	0.90
	Individuals are encouraged to apply the knowledge and experience gained from previous projects to future projects.	3.38	1.09
	Individual knowledge is used in the development of new services.	3.27	1.05
	Total Number	3.34	0.85
Knowledge Preservation	Certain people in the workplace are responsible for updating files and databases.	3.42	0.96
	Certain personnel in the workplace are responsible for maintaining the applicability of knowledge in databases.	3.01	0.98
	Employees can access the knowledge they need.	3.67	0.79
	The senior manager is responsible for reviewing the	3.10	1.05

Component	View	Mean	SD
	knowledge and information employees require.		
	There is a clear strategy in the workplace for how to use knowledge.	3.00	0.98
	Total	3.24	0.75

According to Table 1, the average evaluation of the knowledge acquisition component by participants was 3.26, which was favorable. Employees acquire new abilities due to initiatives, and the statement "Job turnover is encouraged at my place of employment" had the lowest average. The average participant gave the knowledge-generating component a good rating of 3.42. The average was most remarkable for the category "experiences used to acquire knowledge." It was discovered that employees are encouraged to examine earlier mistakes to develop competence. The average score for participants' perceptions of the knowledge storage component was 3.19, which was satisfactory. Among the knowledge storage items examined, "Knowledge is archived electronically (non-printed version) at work" has the highest average, while "Knowledge and information are retained in people's memory (brain)" has the lowest average.

The average participant gave the knowledge distribution component a rating of 3.13, which was considered favorable. Employees who share their knowledge with others are recognized and rewarded, while employees with remote access to databases at work earn the least.

The average score for the knowledge utilization component of the assessment was 3.34, which was satisfactory. The average for "People use knowledge to address most workplace problems" was the greatest, while the average for "People utilize knowledge to develop new services" was the lowest. The average rating for the knowledge retention component was 3.24, which was satisfactory. The highest average was for "employees can obtain required information," while the lowest average was for "there is a clear strategy for employing knowledge in the workplace." The Pearson correlation test was performed to confirm the research hypothesis that there is a relationship between knowledge management components and research rankings of research centers. The results are shown in Table 2.

Table 2

Investigating the Relationship Between Knowledge Management Components and Research Rankings of Research Centers

Component	1	2	3	4	5	6	7
Research rank of the research center	1						
knowledge acquisition	-0.08	1					
Knowledge creation	-0.155*	0.605	1				
Knowledge storage	0.142*	0.307	0.451	1			
Knowledge dissemination	-0.015	0.545	0.775	0.602	1		
Knowledge application	-0.245*	0.496	0.772	0.355	0.780	1	
Knowledge preservation	0.184**	0.491	0.553	0.715	0.792	0.527	1

Table 2 shows a statistically significant association between knowledge creation and application and a research center's research rank (P-value<0.05) and a statistically significant

relationship between knowledge storage and retention and a research center's research rank. There was a direct (incremental) type (P-value<0.05). Additionally, no statistically significant relationship existed between knowledge acquisition and distribution and the research center's rank (P-value >0.05).

Discussion

The study investigated faculties' perspectives on applying knowledge management components in the Iran University of Medical Sciences research centers. The study's findings can guide the university's knowledge management activities within affiliated research centers. The results also indicated that adopting knowledge management components in research centers connected with the Iran University of Medical Sciences is relatively desired. According to the findings, the average participant's perspective of the knowledge acquisition component was 3.26, indicating they were in a relatively favorable situation. According to Kazemi Mehr and Keyhan (2020), the status of the knowledge acquisition component in Osko City's education was evident. Safari, S. & Heidari Chiane (2017) research also revealed that knowledge acquisition among faculty members of distant learning universities was satisfactory. The status of the knowledge acquisition process was moderate in scientific research (Behboudi, Abbas Nejad, & Daneshmandi, 2016)

Acquiring knowledge is one of the first components of the knowledge management process. It can be obtained from individuals, groups, and resources both inside and outside the organization by imitating or emulating successful actions of others through systematic experience, search, and numerous research projects. Knowledge management will be harmed if knowledge acquisition is not made appropriately in an organization, particularly a research center that is the hub of knowledge development and dissemination. On the other hand, the organization should strive to improve this process by submitting new research proposals and establishing scientific collaborations with other research institutions, ensuring that new knowledge is always available to the organization's human resources and that its use results in its growth.

The participants' average view on using the knowledge creation component was 3.42, relatively good. The findings of Sharifzadeh et al. (2017) and Hatamleh, Al-Zoubi and Darawsheh (2017) showed that the performance of the knowledge creation component is moderate, which is consistent with the results of the present study. However, Kazemi Mehr and Keyhan (2020) found that the status of the knowledge creation component in the target society was unfavorable. According to Hejazi and Nazarpouri (2018), the level of the knowledge creation component is lower than average on selected campuses of Farhangian University. According to Behboudi et al. (2016), the state of the knowledge creation process was below average, which contradicts the results of the present study.

The participants' average rating of the knowledge storage component was 3.19, indicating that it was in relatively good condition. According to Kazemi Mehr and Keyhan (2020); Sharifzadeh et al. (2016); Abbaspour, Kianfar, Nili Ahmadabadi, Rahimiyan and Momeni (2018) and Hatamleh, Al-Zoubi and Darawsheh (2017) the knowledge storage component is in an ideal state, which is compatible with the present study's findings. However, per Hejazi and Nazarpouri (2018) and a scientist's examination (Behboudi et al., 2016)), the state of the knowledge storage process is below average, which contradicts the present study's findings. If the organization's knowledge storage procedures are not adequately implemented, acquired knowledge will gradually fade from employees' minds and become unusable. Knowledge

storage is crucial because the experiences gained from the activities of individuals at various stages of knowledge acquisition and production will be tacit knowledge in their minds. These experiences may be lost if not shared with others or written down. Organizations need to create mechanisms for recording these experiences and knowledge to be used properly when needed. As a result, other aspects of knowledge management, such as knowledge distribution and sharing, may suffer tremendously.

The average participant's evaluation of the knowledge distribution component was 3.13, which was favorable. This is supported by the findings of Kazemi Mehr and Keyhan (2020); Sharifzadeh et al. (2017); Abbaspour, Kianfar, Nili Ahmadabadi, Rahimiyan and Momeni (2018); Behboudi et al. (2016); Hatamleh, Al-Zoubi and Darawsheh (2017). However, Hejazi and Nazarpouri (2018) found that the knowledge transmission component had a lower status than average. Hatamleh, Al-Zoubi and Darawsheh (2017) concluded that the performance of the knowledge dissemination component in Jordanian universities is modest. Also, in the study of Chen, Xu and Zhai (2019) it was observed that the status of knowledge transmission in participatory universities is beneficial. In this respect, the results obtained are congruent with the present study results. In Conrad, Dierberger and Isaacson (2019) study, the information sharing status was judged as poor, not in line with the current study results. The organization's knowledge should be shared through exchanging information and opinions between colleagues and, in some cases, with individuals from other organizations.

These interactions can occur through joint meetings and sessions, allowing for easy exchange of ideas and thoughts. Encouraging people to present and distribute the knowledge they have gained over the years in their activities can lead to the growth of the individual and other people who work in the organization, ultimately leading to the promotion and development of the organization. On the other hand, information technology capabilities and tools can help with this issue.

Participants' average utilization rating of the knowledge utilization component was 3.34, which was satisfactory. Sharifzadeh et al. (2017), Abbaspour, Kianfar, Nili Ahmadabadi, Rahimiyan and Momeni (2018) and Behboudi et al. (2016) discovered a moderately developed process of knowledge utilization. However, Kazemi Mehr and Keyhan (2020) and Hejazi and Nazarpouri (2018) state that the knowledge transfer component is lower than average in target communities. While knowledge acquisition is critical, the success of a knowledge management process within an organization is contingent upon its use and application.

The participants' average rating of utilizing the information retention component was 3.24, indicating that it was in good working order. The findings of Abbaspour, Kianfar, Nili Ahmadabadi, Rahimiyan and Momeni (2018) suggested that knowledge internalization (knowledge retention) was higher than average, which was consistent with the results of our investigation. However, the knowledge retention component was lower than average in Rafati Shaldehi, Hosnavi, Behazin and Banitaba (2008) study of the knowledge management model in a military research center, contradicting the current study's findings. Hatamleh, Al-Zoubi and Darawsheh (2017) discovered that the performance of the virtual environment component for implementing and sustaining knowledge in Jordanian institutions is moderate, contradicting the current study's findings. Maintaining knowledge within the organization is critical to its improvement. If a business's personnel understand how to apply the information they desire, it can be crucial in promoting the organization. Organizational policies, on the other hand, should employ knowledge management techniques. Skilled employees, often known as the knowledge

force, are one form of knowledge retention. Assume the organization can retain these individuals after gaining extensive experience in various work activities. In that situation, it can significantly enhance the implementation of the knowledge management system and, as a result, the organizational circumstances.

The findings revealed a statistically significant association between knowledge development and application and the research center's research rank (P-value<0.05) and a statistically significant relationship between knowledge storage and retention and the research center's research rank. There was also a direct (incremental) kind (P-value<0.05). Moreover, there was no statistically significant relationship between knowledge acquisition and distribution with the research rank of the research center (P-value>0.05).

Conclusion

According to the results, the research centers' policy to preserve and store knowledge has been better than other sectors. So that each center pays more attention to the issue of knowledge retention as the research rank increases. However, these centers have not managed the components related to the production and application of knowledge, which requires more attention from the directors of research centers affiliated with the Iran University of Medical Sciences. The lack of connection between knowledge acquisition and knowledge distribution or sharing is another issue that research centers should pay attention to. For better coherence in implementing knowledge management in research centers, paying attention to all knowledge management components is necessary.

Since a questionnaire was used to collect data in this study, some people identified in the research sample were reluctant to participate. Some of the questionnaires were incompletely completed. The researcher communicated with the participants via email and encouraged them to complete the questionnaire to solve this problem. Another limitation was the occurrence of the COVID-19 pandemic in the middle of data collection, which prevented the researcher from visiting the research centers in person. So, the researcher prepared a questionnaire via a link and sent it via email to participants in the study. According to the results, knowledge management components in research centers affiliated with the Iran University of Medical Sciences are relatively good. Still, it is necessary to make more efforts to improve this situation and achieve the desired condition. Paying more attention to the items mentioned in this study can improve this situation.

Conflict of interests

The authors state that there is no conflict of interest.

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