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Original Article

Evaluation of the Successful Rate of Knowledge Management at Shiraz University of Medical Sciences (SUMS) Using the European Foundation for Quality Management Model

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Abstract

Introduction: Knowledge management can play an important role in attracting employees' participation and is important from the point of view of human resource management. On the other hand, performance evaluation is one of the main duties of managers, in this regard, the European Foundation for Quality Management (EFQM) model is helpful. This study aimed to evaluate the success rate of knowledge management at Shiraz University of Medical Sciences (SUMS) using the EFQM model.

Methods: This cross-sectional study was conducted from March to April 2024, and 246 staff from SUMS were enrolled using convenience sampling. A standard structural questionnaire was used to collect the data. The reliability and consistency of the questionnaire components were determined using Cronbach's alpha coefficient ($\alpha=0.89$). Data were analyzed using descriptive, one-sample t-test, independent samples t-test, and ANOVA test through SPSS version 16.

Results: The research results indicated that the knowledge management performance of the SUMS staff was successful in terms of leadership, participation and resources, processes, policy and strategy, employee results, key performance results, community results, and customer results ($P<0.05$). However, from the staff's perspective, it can be concluded that knowledge management has not been successful as viewed by employees ($P=0.350$).

Conclusion: The findings of this research showed that knowledge management was successful in SUMS. This study determined the knowledge management level and could guide the managerial decisions and policies.

Keywords: Knowledge management, European foundation for quality management, Human resource

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Introduction

It has been proven that the cooperation of each member of the society is needed to achieve sustainable development. In the era of knowledge, the basic prerequisite for the sustainable development of a healthy human being is essential (1). Health development is one of the most basic aspects of human social evolution, which requires public participation and participatory management. Awareness, a sense of responsibility, and practical action of each person are necessary to ensure public health (2). People's participation in health and treatment brings about the improvement of both quality of health services and the health level of society (3, 4). Participatory management has also

been proposed as an effective approach to the development of health, and to develop health, all members of society, including students, health volunteers, and health personnelshould cooperate in this way (5, 6). As to the implementation of participatory management in an organization, different methods are used; among them, knowledge management is one of the most important methods of implementing participatory management in organizations (5, 7, 8). Over time, the number of organizations that have used this type of management is increasing. For continuation and completion of this movement, the necessity of evaluating the performance of knowledge management in different organizations is felt (9). Performance

evaluation is a systematic and comprehensive process in which activities, processes, and results are compared with the goals and criteria set. Based on the findings, it is possible to improve the situation (10). Attention to the health system and the need to perform its efficient evaluation due to the complexity of the activities in this area and the role of this group as the protector of the health and medical system of the country is known by everyone. In this regard, the organizational excellence model of the European Foundation for Quality Management (EFQM) has been introduced as the primary framework for evaluating knowledge management performance (11). The European performance excellence model of quality management is based on the hypothesis that excellent results (including customer satisfaction, employee satisfaction, society, and key performance results) can be achieved through strong leadership, competent and committed employees, appropriate policies and processes, and capable resources and partnerships (10-12). This model is based on the link between the purpose and strategies of the organization, which is aligned with the United Nations Sustainable Development Goals to simultaneously ensure performance and drive transformation, create sustainable value for its key stakeholders, and deliver significant results (13). This model uses a strategic management lens and fits well in describing the business model. Business excellence models are mainly designed with the participation of business leaders and experts(11, 13, 14). Nevertheless, several management theories support the EFQM model at the theoretical level. Although this analysis is limited to conceptual and theoretical analysis, this analysis can help academics and business leaders understand this new model and support future empirical research (11, 13). One of the ways to deal with the challenges of creating a high-performance organization in healthcare is this model. The nature of this model is that it can be used as a self-assessment tool in all healthcare organization levels and as an audit tool for the quality award (15). In addition to being a tool used in improvement projects, peer review of professional practices, accreditation, and certification, the EFQM approach is mainly applied as a framework for quality management and as a conceptualization for organizational excellence (10, 11). In Iran, some universities (10, 11)

have used this approach. Although SUMS has not used this approach, universities of medical sciences are seriously dependent on knowledge management activities to become knowledge-based organizations. Little familiarity with the knowledge management process and the uncertainties in this field cause insufficient productivity and inappropriate use of knowledge in organizations, especially educational organizations (16).

While evaluating and implementing knowledge management systems can present challenges, the long-term benefits usually outweigh the disadvantages. For organizations looking to improve their knowledge flow, decision-making, and overall efficiency, investing in assessment processes is an essential step toward reduction of losses from knowledge gaps and increasing overall performance (16-18). Despite the importance of knowledge and its management in medical sciences, to the best of our knowledge , not many studies in this field have been carried out, which indicates the limitations of the studies conducted in this field. Based on these studies, it seems that there is not enough information about knowledge management in medical science employees; therefore, this study was designed to evaluate the knowledge management performance of SUMS using the EFQM model. Based on the obtained results, suitable solutions can be presented to the officials and policymakers in this field.

Methods

This cross-sectional study was conducted from March to April 2024, and 246 staff affiliated to SUMS were enrolled using quota and convenience sampling. The minimum sample size required to conduct this study is based on the formula and objectives of the study and considering that different percentages from 30 to 80% have been reported in previous studies (10); we considered a ratio of about 50% to reach the minimum optimal sample size. With this information and taking into account the relative error of 10% and the confidence level of 95%, as well as using the formula $n = \frac{Z^2 P(1-P)}{d^2}$, and correcting the finite population using the formula $\bar{n} = \frac{n}{1+\frac{n}{N}}$, the sample size of 246 subjects was obtained. We have 9 floors in the SUMS building. Each floor was considered as one quota. Then, we divided the total sample equally among 9 floors, so we had 28 people equally on each floor. Then, on each

floor subjects were selected using convenience sampling. Employees who had full consent to participate in the study were included and subjected to interviews.

Data Collection

The data collection tool included a form and a standard questionnaire used many times in national studies. The first part contains 7 items that examine demographic information. The second part includes a questionnaire containing 51 items. All items of the questionnaire are scored using a 5-point Likert scale ranging from completely disagree, disagree, have no opinion, agree, to completely agree. The validity of this questionnaire was estomated as content validity using a panel of experts. Four professors and management experts participated in this panel for two sessions. Reliability was measured using Cronbach's alpha, which was 0.89. This questionnaire has been used in several studies in the country (10, 11, 19, 20).

Statistical Analysis

Data normality was checked by the Shapiro-Wilk test and skewness and kurtosis indices. Normal data are presented as mean±SD and categorical data are expressed as numbers (%). The one-sample t-test was used for testing the level of successful knowledge management. Independent two-sample t-test and one-way analysis of variance (ANOVA) were used for comparing the scores between the groups. Also, the Pearson correlation coefficient was used. The data analysis was performed using SPSS software (Version 16. Chicago, SPSS Inc., United States). A P value<0.05 was considered statistically significant.

Ethical Consideration

All research protocols were conducted under the supervision of the University Ethics Committee (Code: IR.SUMS.REC.1403.012). The participants' information remained confidential, and all the selected individuals participated in this study based on their consent. In addition, the participants had the absolute right to withdraw from the study at each stage.

Results
Demographic Characteristics

Demographic characteristics of the participants are shown in Table 1. The results showed that most of them (52.4) were men. Also, 52.5% of them were under 36 years old.

Table 1: The demographic characteristics of the studied sample

Variable	Category	N (%)
Gender	Female	117 (47.6)
	Male	129 (52.4)
Age (year)	20-25	10 (4.1)
	26-30	61 (24.8)
	31-35	58 (23.6)
	36-40	63 (25.6)
	41-45	27 (11.0)
	46-50	24 (9.7)
	51+	3 (1.2)
Married status	Married	173 (71.5)
	Status	69 (28.5)
Education	Diploma & under	35 (14.2)
	Associate Degree	49 (20.0)
	Bachelor's degree	93 (38.0)
	Master's degree	43 (17.6)
	Doctor	25 (10.2)
Employ status Of Staff	Official	78 (31.8)
	Five year contract	46 (18.8)
	By Contract	113 (46.1)
	Working under "Tarh"	8 (3.3)
Work experience (year)	1-5	61 (25.2)
	6-10	67 (27.7)
	11-16	61 (25.2)
	16-20	33 (13.6)
	21+	20 (8.3)

Table 2: Descriptive statistics and significant value for different dimensions of knowledge management

Scale	Minimum	Maximum	Mean	Std	Criteria	P value
Leadership	8	40	25.46	5.6	24	<0.001
Staff	5	25	14.50	3.6	15	0.350
Contributions and resources	6	30	19.55	4.9	18	<0.001
After the processes	9	45	29.47	6.6	27	<0.001
Policy and Strategy	4	20	13.80	2.9	12	<0.001
Employee results	5	25	16.20	3.7	15	<0.001
Key performance outcomes	4	20	13.20	2.9	12	<0.001
Community results	5	25	17.00	3.7	15	<0.001
Customer results	5	25	16.10	4.3	15	<0.001
Total	95	255	166.50	27.6	153	<0.001

Table 3: Comparison of knowledge management score according to demographic and baseline data

Variables	Category	Mean±SD	P value
Gender	Male	264.8±31.2	0.320
	Female	168.3±23.9	
Married status	Married	166.5±28.2	0.760
	Single	165.3±26.4	
Education	Diploma & Under diploma	172.6±31.8	0.390
	Associate Degree	169.0±29.8	
	Bachelor's degree	166.2±27.4	
	Master's degree	157. 9±26.8	
	Doctor	168.8±29.2	
Employ status Of Staff	Official	166.1±28.3	0.340
	Five year contract	166.0±27.5	
	By Contract	169.1±29.3	
	Working under "Tarh"	159.3±26.9	

The mean age of the examined people was 35.7. 28.5% of the surveyed subjects were single, and 71.5% were married. The results of the research also indicated that most of the staff were educated, such that 38% of them had a bachelor's degree, 17.6% a master's degree, 20% a post-diploma, and 10.2% a doctorate. Meanwhile, 14.2% of them had an education lower than postgraduate. Examining the employment status of the staff showed that most of them were working under a five-year contract (46.1%). Meanwhile, 31.8%, 18.8%, and 3.3% were office workers under a contract and working under "Tarh", respectivly . 52.9% of them had less than 10 years of experience. Their mean service history was 8.10 years. The results of the t-test showed that the mean of all dimensions, except the staff dimension, was significant different from the criteria value (P<0.05). In other words, these results indicated that from the employees' point of view, knowledge management was successful in all dimensions except for the staff (Table 2). The results of the comparison of the total score of knowledge management according

to the characteristics of the staff are summarized in Table 3. According to the t-test and one-way ANOVA summarized in Table 3, there was no statistically significant difference between the staff with different characteristics in their opinion regarding knowledge management at SUMS.

On the other hand, the Pearson correlation coefficient showed that there was a significant correlation between age and knowledge management score (r=0.124 P=0.049), whilethere was no significant correlation between the service history and knowledge management score (r=0.02, P=0.200).

Discussion
The results of the descriptive findings indicated that among the demographic variables (gender, age, marital status, level of education, work experience, and employment status,), only with the increase in the age of the employees, their attitude toward the success of knowledge management was more positive. Morshidi, who in his research evaluated the knowledge management performance of the agricultural

jihad (Jahād-e Dāneshgāhi) of Fars province using the EFQM model, concluded that the variables of age, work experience, organizational position, status Employment, and academic degree had an effect on the success of knowledge management; according to his research, the variables of gender and marital status did not affect the success of knowledge management (21). The results of the inferential findings of this research indicated that the implementation of knowledge management at SUMS was successful. This result is not in the same line with the findings of Fuladi (22). Based on their results, the status of the knowledge management of SUMS using the SIP model was below average, which means that knowledge management in this university needs to be strengthened, and requires more attention and culturalization (22).

In general, by determining the status of knowledge management, it is possible to provide appropriate feedback to all stakeholders so that it can be used in decision-making. According to the data analysis in the leadership dimension, it can be concluded that knowledge management has been successful in the leadership dimension. This is an important sign of the direct role of leaders in assuring the creation and application of knowledge management and its continuous improvement, encouraging the staff, persuading them to cooperate in knowledge management, thanking the stakeholders for their loyalty, aligning the knowledge management structure with the organization's strategy, paying attention to employees and responding to them; appreciating team efforts, providing necessary resources for changes through knowledge management, ensuring effective changes through knowledge management, and finally reviewing the effectiveness of changes through knowledge management. It is worth mentioning that according to the research of Abdulrahim Noh, Homs, leadership is the most effective activity in the direction of the success of the scientific-applied centers of Markazi Province using the model of organizational excellence (23). From the analysis of the data in terms of staff, it can be concluded that knowledge management has not been successful from the staff's perspective. The lack of specialized training for employees before and after the establishment of knowledge management, lack of knowledge of the organization's employees about the regulations

and objectives of knowledge management, lack of empowerment of employees by managers, and lack of participation of employees in policy formulation can be found in the analysis of the results. In this regard, Karol et al. (24) have stated that the resistance of employees is the main reason for the failure of organizations in implementing management systems, and they have introduced employee participation as the most important solution to this problem. The results of the research in the dimension of contributions and resources indicate that, according to the respondents, the knowledge management of SUMS has been successful in this dimension. The analysis of the results revealed that the software used in knowledge management, compilation, and implementation of processes is available to everyone. Finance to support the policy and strategy of the organization, development of intellectual assets, visibility of knowledge management software for everyone, use of existing facilities, development of innovative technologies, and ensuring the security of information can be considered as the reasons for the success of this aspect of management. In this regard, Hassanzadeh Dizji also evaluated the performance of the National Library and Records Organization in a case study (25). Their findings showed that the criteria of participation and resources were given the highest scores.

The results of the data analysis in the process dimension showed that knowledge management was successful in this dimension. The design of knowledge management processes, management of communication issues within knowledge management, ease of presenting knowledge and informing the results of knowledge review to working knowledge, existence of regulations about knowledge management in an approved and up-to-date manner according to organizational characteristics, effective review of policy processes to realize the policy, announcement of changes in processes to all related stakeholders and finally training employees to implement new processes can be considered as the reasons for the success of knowledge management in this dimension. It is worth mentioning that this result is contrary to the findings of Fouladi (22), who evaluated the proposal system of the SUMS using the SIP model. The results of data analysis in the dimension of policy and strategy indicated that the suggestion system was considered successful

in this dimension. In data analysis, it can be said that the policy and strategy are based on the information obtained from performance measurement and research. Since in SUMS, the goals of knowledge management are in line with those of the organization, knowledge is also presented in line with the tasks of the employees and the development of the organization; therefore, identifying the key processes for the implementation of the policy and evaluating the relevance and effectiveness of the policy can be called one of the reasons for the success of knowledge management in this dimension. Likewise, Davis has found that coherence and integration between strategy and goals is an important factor in the effective implementation of EFQM models, and higher coherence leads to the implementation. This model will be more successful and, as a result, the performance of the organization will be improved (26).

Data analysis in the dimension of employees revealed that knowledge management was successful in this dimension. This dimension represents the employees' perception of knowledge management. Data analysis also showed that both the number of knowledge provided by employees and the participation rate of employees were increasing. Ekyuz also states in his article on the implementation of the EFQM excellence model in one of the Turkish universities that this model creates a good working environment where employees can use their skills and enhance the spirit of teamwork (27). The results of the data analysis in the dimension of key performance indicated that knowledge management was successful in this dimension.

The analysis of data in the dimension of community showed that knowledge management was successful in this dimension, and this indicates that Shiraz University of Medical Sciences actively participates in knowledge management associations and conferences and is successful in using organizational facilities more effectively. Morshidi also in his research on the knowledge management performance of the agricultural jihad (Jahād-e Dāneshgāhi) of Fars province using the EFQM model concluded that knowledge management to reduce costs, reduce waste, and maintain and effectively use organizational facilities had successfully improved the organizational performance at the level of public opinion (21). The results of the data

analysis in the dimension of customers indicate that knowledge management has been successful in this dimension. This important point indicated that knowledge management was successful in consulting and thinking of employees with clients and also succeeded in involving employees in improving the services. This finding is in the same line with the results of Haydes et al.'s research; they believe that evaluation based on the EFQM model can create a more customer-oriented culture much sooner than expected (28).

Conclusion

The results of this research indicate that the knowledge management performance of the SUMS staff has been successful in terms of leadership, participation and resources, processes, policy and strategy, employee results, key performance results, community results, and customer results.

This study was able to determine knowledge management level and is a guide for managerial decisions and policies. This study also had limitations . Due to the lack of sufficient resources of the research done in the universities of medical sciences in connection with the subject of the mentioned research, it was not possible to make enough comparisons. It also seems that the personal issues of the employees are not ineffective in answering the questions of the questionnaire; on the other hand, the participants in the research were only the employees of the SUMS headquarter of , so the results cannot be generalized to other health and treatment networks and hospitals. According to the results of this study, the following suggestions are made:

- In the field of the concepts of EFQM models and their adaptation to the current situation, additional training should be provided.

- The necessary structural measures taken to reduce the formality and focus and more flexibility in the implementation of the instructions provide the necessary ground for the stabilization and growth of the mentioned system.

- Employees who are new to the office should be given the necessary training to provide knowledge.

- Knowledge management advertising should be strong to create more motivation for employees to provide knowledge.

- The time between receiving knowledge and the time of handling the knowledge and

announcing its result should be shortened.

- The results of knowledge management performance evaluation using EFQM, through different methods (questionnaire, proforma, workshop, etc.) should be compared.

- Knowledge management in other universities of medical sciences should also be evaluated using the EFQM model.

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Authors' Contribution

Z.Z. and A.Y. conceptualized the study, conducted the research, wrote the manuscript, and approved the final version of the manuscript.

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Ethics Approval and Consent to Participate

This study was approved by the Ethics Committee of Shiraz University of Medical Sciences with the ethics code of IR.SUMS.REC.1403.012. In the present study, the participants were assured about the confidentiality of their information.

Consent for publication

Not applicable.

Conflict of Interest

There are no conflicts of interest.

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