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Knowledge Management Status in a Non-Governmental Public Hospital: The Current Status and Improvement Solutions

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Abstract

Introduction: Knowledge management (KM) has a pivotal role in optimizing performance at organizations. In recent decades, hospitals used KM to achieve optimized performance. This study aimed to determine the knowledge management status in a non-governmental general private hospital in Tehran in 2019.

Methods: This cross-sectional study was done in 2019. We selected 171 clinical and administrative staff at the hospital by using random sampling. Data were collected through a valid and reliable questionnaire. Data analysis was done by SPSS v 22 through descriptive and analytical statistics.

Results: The results of the study showed that KM dimensions had an inappropriate status (2.99 out of 5). Among the KM dimensions, Technology had a worse status than others (2.72 out of 5). Moreover, there was a significant relationship between People and Technology ($P<0.0001$, $r=0.59$). Also, there was a significant relationship among all of the KM Process components ($P<0.01$).

Conclusion: Due to the inappropriate situation of technology in the hospital, the managers should help to provide hardware and software requirements and make it a leading hospital for technology use. Due to the positive relationship between People and Technology, equipping the hospital with new technologies led to an increase in the person's abilities and improvement of the health care services delivered to the patients.

Keywords: Knowledge management, Hospital, Processes, People, Technology.

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Introduction

Knowledge Management (KM) is a tool for organizing activities in data gathering, transforming data to efficient information, and knowledge as well as sharing and applying knowledge in organizations, which is effective in improvement of efficacy and performance for the organization. KM is an integrated approach to identifying, controlling and sharing all of the organization's information assets such as data banks, documents, methods, and strategies (1).

The healthcare industry, like other industries, has a complex condition, with specific parts such as patients, healthcare providers, physicians, payers (insurers), and the pharmacy (2). One of the main aims of KM is to insulate the hospital's intellectual knowledge and prevent its decline (3). Knowledge is a potential repository for the hospital that will be destroyed due to some problems such as staff burnout, high turnover rate, and improper documentation (4).

Specific KM tools are considered in the retrieval and storage of knowledge assets or other activities such as learning, strategic planning, and hospital decision making as a contributing factor (5). The evolution of attitude and knowledge sharing skills in the patient care process is essential for any KM program in healthcare (6). Hospital management and knowledge sharing of assets will be an efficient step

toward saving the time, reducing the costs, improving the cost restoring process, enhancing the satisfaction criteria, and improving the health education level (7).

By identifying and mapping the intellectual assets of the hospitals, KM generates valuable knowledge assets to create a competitive advantage in hospitals. Since knowledge is dynamically present in healthcare networks, organizations, and processes used by the staff, the hospitals need to have a KM system to create a connection with healthcare networks (8). One of the most necessary functions of many healthcare centers is decision making which is usually complex and needs a regular structure. In unstructured decision making, multidisciplinary data and information are needed to be collected if the decision-maker wants to make a cautious decision (9, 10). Structured decision making in a dynamic and complex environment is considered a difficulty, and the decision-maker usually encounters the shortage of information (11). In such a situation, the need for proper knowledge and information would be very valuable (12); therefore, the use of KM techniques and tools is very useful.

Employing KM caused integration of the information and data produced, such as patient care, research, and seminars (13, 14). Therefore, many studies have been done in this area in recent years. Yan et.al in their study carried out in 2018 concluded that the status of KM deployment in Chinese hospitals was weak and those scores were different ($P<0.05$), and in the examined hospitals, 63.8% had not yet implemented KM program, and 46% had no plans to implement it (15).

Khammarnia et al. (2015) in their study concluded that there was a significant relationship between knowledge management and all aspects of the nurses' quality of life in Zahedan teaching hospitals ($P=0.001$), and knowledge management deployment in hospitals can improve the nurses' quality of life (16). Shahmoradi et al. in their study (2017) concluded that providing the right knowledge at the right time, which is at the decision-making point with the implementation of knowledge management in healthcare, is essential. For this purpose, the use of appropriate tools for knowledge management and a user-friendly system is crucial as it can significantly improve the quality and safety of health care provided both in the hospital and at home (17).

The most important problem in healthcare is the increase of the patients' health level, which is directly proportional to the intellectual capital and knowledge of the hospital, so the experience and technical expertise of individuals must be fully attained, and reflected in strategies, policies, and activities at all levels of the hospital management and patient care activities (18). Therefore, establishing KM in the hospitals is essential. Given the lack of related studies about KM status in non-academic and non-governmental hospitals in Iran, this study was conducted to determine the status of knowledge management in a non-governmental private hospital in Tehran.

Methods

This cross-sectional study was conducted in the year 2019 in a non-governmental public hospital in Tehran. The study population consisted of all clinical and administrative staff of the hospital, including laboratory, radiology, physiotherapy, pathology, nursing, pharmacy, administrative affairs, health information management, clinics, emergency department, maternity, surgery, internal medicine, ICU, and CCU departments. Totally, 171 subjects were selected for the study using random sampling.

Data gathering was done by a self-made questionnaire that included the main dimensions of KM based on the literature (19-21). Figure 1 shows the main dimensions of KM and the KM process components.

The questionnaire had four main parts including demographic information (age, sex, work experience, academic level); Process of KM (47 questions, 1-47) including knowledge strategy and policies, knowledge finding & creating, knowledge documentation & organizing, knowledge sharing, knowledge use & reuse, knowledge evaluation and feedback; Technology (12 questions, 48-59), and People (8 questions, 60-67). The questionnaire was designed based on previous studies in this field of study (22, 23). We used five-point Likert scale for the questions (1=completely opposed to 5=completely agree).

To determine the validity of the questionnaire, at the first step, we tested the face validity by the opinions of seven faculty members of health information

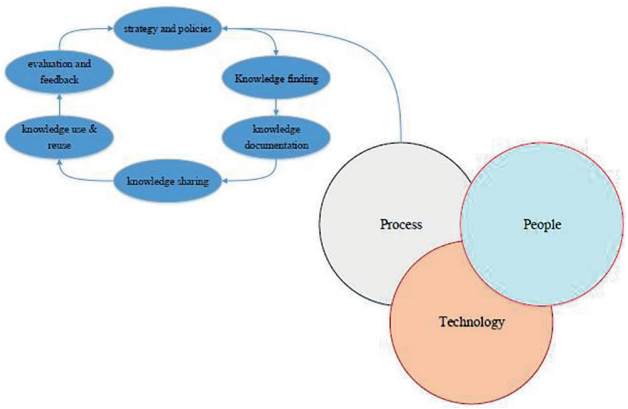

Figure 1: The knowledge management main dimensions

management (three persons), medical informatics (two persons), and health services management (two persons) from the medical universities.

To determine the content validity, we distributed the questionnaire among 10 experts in the field of health information management, medical informatics, and health services management of medical universities. Content validity ratio (CVR) and content analysis index (CVI) was calculated based on the following formulas:

$$CVR = \frac{n - \frac{N}{2}}{\frac{N}{2}}$$

$$CVI = \frac{People\ who\ chose\ 3\ or\ 4\ item\ number}{All\ experts}$$

For determining the CVR, each question was scored 1-3 (including not necessary, helpful but not necessary, and necessary). To determine the CVI, we calculated the relevancy of the questions, which ranged from 1 to 4 (including not relevant, somewhat relevant, relevant, and completely relevant).

The CVR was 0.80 that confirms that the questionnaire was relevant in this regard (0.79 is acceptable for a 10-person sample. The estimated CVI of the questionnaire equaled 0.90, which confirmed the acceptability of the questionnaire in this respect (0.79 is adequate for a 10-person sample).

To calculate the reliability of the questionnaire, we distributed it among 30 persons and measured the reliability by using Cronbach α. The reliability of the questionnaire is shown in Table 1.

As shown in Table 1, the reliability of the questionnaire was 0.83 that is acceptable.

Data analysis was done by SPSS version 20; descriptive statistics including frequency, mean and percentage were used. Also, Pearson correlation coefficient, independent sample t-test, and ANOVA were used as analytical statistics to assess the relationships.

Data gathering was done after coordinating with hospital managers. The researchers assured the participants which all information would remain confidential until the end of the study. Also, written informed consent was obtained from all of the participants.

Results

Of 171 participants, 51% (87) were female and the rest were male. Personnel with a bachelor of science degree (46.2%) had the highest frequency, and Ph.D. degrees had the lowest frequency (4.7 %).

Table 2 shows the frequency and average of KM status in the hospital.

As shown in Table 2, knowledge use and reuse (3.29 out of 5) had the highest score among the components related to KM processes, and evaluation and feedback (3 out of 5) were the most inappropriate

Table 1: Reliability of the questioner

Row	Questioner dimensions	No. of questions	P
1	Knowledge Strategy & Policies	6	0.73
2	Knowledge Finding & Creating	11	0.84
3	Knowledge Documentation & Organizing	6	0.77
4	Knowledge Sharing	11	0.80
5	Knowledge Use & Reuse	7	0.79
6	Knowledge Evaluation & Feedback	6	0.91
7	Technology of Hospital	12	0.82
8	Persons	8	0.71
Total		67	0.83

Table 2: KM dimensions status in the hospital

	Components	Min	Max	Mean	SD	Mean out of 5	
KM Processes	Knowledge Strategy & Policies	6	30	18.48	6.92	3.08	3.12
	Knowledge Finding & Creating	13	55	35.32	10.56	3.21	
	Knowledge Documentation & Organizing	6	30	18.60	6.21	3.10	
	Knowledge Sharing	11	87	33.77	11.52	3.07	
	Knowledge Use & Reuse	7	35	23.01	6.87	3.29	
	Knowledge Evaluation & Feedback	6	30	18.01	5.97	3.00	
Technology	Information Technology Usage Status	12	60	32.60	12.04	2.72	
Persons	Status of individual abilities of knowledge users	8	40	25.13	7.62	3.14	
Total				25.62	8.46	3.08	

component of the KM process. Among the KM dimensions, the People dimension condition (3.14 out of 5) was more favorable than other dimensions. According to the results of the study, among the components of KM, knowledge use and reuse had a better status and in the three main dimensions of KM, the People dimension was more appropriate. The findings showed a significant difference in the dimensions of KM in the hospital from the perceptive of the clinical and administrative staff (Table 3 shows the results of data analysis using independent sample t-test).

According to Table 3, the dimensions of KM of the hospital were significantly different from the perspective of two administrative and clinical staff (P<0.05). Table 4 shows the correlation analysis of the dimensions of knowledge management (People, Processes, and Technology).

Based on Table 3, there was a direct and significant relationship between Technology and People (P<0.0001, r=0.59). Also, there was no significant relationship between KM Processes and Technology (P=0.27, r=-0.08). It should be noted that there was a significant correlation between all components of the KM processes based on the Pearson correlation coefficient test (P<0.01).

Discussion

The hospital KM status was at a moderate level, and the KM status was inappropriate in some dimensions, which could be attributed to various aspects such as being a non-University and non-governmental Hospital. The studies which were done about the role of knowledge in the performance of organizations can refer to Chang et al.'s study (2009), which indicated the key factors affecting the KM process in the organization (24). Kiessling et al. (2009), in their study, highlighted the significant impact of KM on organizational outputs, innovation, product and service improvement, and employee enrichment (25). The results of the mentioned studies are consistent with those of the present study about the importance of KM in successful performance of the hospital.

The results of the present study showed that the status of the KM processes components deployment in the hospital was at a moderate level (3.12 out of 5). Mirghafouri et al. in their study in 2013 concluded that the status of KM implementing processes in Yazd's health sector was not in an acceptable status (2.85 out of 5) (23). Mozaffari and Ahmadi in their study in 2014, which was done in Qazvin University of Medical Sciences teaching hospitals, obtained similar results (26). It seems that the attention to KM processes in implementing and using KM has not

Table 3: Comparison of KM dimensions based on clinical and administrative groups using Independent sample t-test

Dimensions		Independent sample t test				P value
		Clinical		Administrative		
		Mean	SD	Mean	SD	
Process	Knowledge Strategy & Policies	19.43	7.02	15.67	5.80	0.006
	Knowledge Finding & Creating	36.70	10.72	31.23	8.99	0.008
	Knowledge Documentation & Organizing	19.98	6.35	16.56	5.36	0.002
	Knowledge Sharing	34.82	10.93	30.49	12.71	0.000
	Knowledge Use & Reuse	23.55	6.87	21.39	6.67	0.000
	Knowledge Evaluation & Feedback	18.73	5.98	15.86	5.47	0.003
Technology		32.94	12.66	31.60	10.04	0.05
Person		24.84	7.65	31.20	38.43	0.62

Table :4 the correlation between KM dimenisons

Dimension	Test	Process	People	Technology
Process	Pearson Correlation	1	-0.206**	-0.085
	Sig. (2-tailed)		0.007	0.270
	N	171	171	171
People	Pearson Correlation	-0.206**	1	0.593**
	Sig. (2-tailed)	0.007		0.000
	N	171	171	171
Technology	Pearson Correlation	-0.085	0.593**	1
	Sig. (2-tailed)	0.270	0.000	
	N	171	171	171

**Correlation is significant at the 0.01 level (2-tailed).

been sufficiently developed, and we should carefully plan for and develop the use of KM processes.

Based on the other results of the study, from different components of the KM processes, the knowledge use and reuse (x=3.29) had a higher mean score. Lee in his study identified that knowledge use was one of the important components in KM deployment in hospitals (27). Also, Hojabri et al. in their study in 2014 determined that with the current status of KM processes, knowledge management cannot be successfully deployed in the Iranian health industry (28).

Among the key knowledge management dimensions, the People (as a KM dimension) was in a better condition, and Technology had an inadequate status. Due to the better status of knowledge users in the hospital, the personnel are taking individual measures to manage their specific knowledge, and hospital administrations can make great use of this status in establishing KM in the hospital. One of the most important causes of the moderate level of KM was the lack of a specific view in the field, lack of systematic planning, lack of attention to key and effective individuals in the successful promotion and its implementation.

Other results of the study showed that from the perspective of knowledge users, the hospital staff was ready to accept and use new knowledge and teachings (as one of the Knowledge Finding & Creating items that had the highest average score 4.13 out of 5). The adoption of technology and knowledge management activities in organizations plays a pivotal role in their success (29), so with the opportunity provided in the hospital, the necessary KM plans can be implemented.

The results showed that the components of the KM processes were significantly different from the clinical and administrative staff perspective (P>0.05). Also, Yan et al. in their study indicated that KM deployment in the hospitals needed specific conditions and should be given specific consideration (30).

As the results showed, the mean score of KM dimensions in clinical personnel was higher than administrative personnel, which seems to be normal due to their need to be up-to-date. However, administrators and policymakers should consider the administrative personnel as a key part of hospital staff and involve them in the KM through careful planning. Acquiring it to counterparts will prevent the waste of organizational resources and can also be effective in improvement of the provision of health care services.

The results of the correlation analysis of KM dimensions showed that there was a significant correlation between People and Technology, and there was no significant correlation among People and Processes, Technology, and processes in the hospital. Based on the results of the study, it seems that personal characteristics are very effective in the skills of using technology and learning and applying them in the workplace.

According to the results, there was a significant correlation between all components of the knowledge management processes. It seems that in establishing knowledge management in the hospital all aspects and components should be considered to resolve the related issues. Mohebbifar et al. (2014), in their study conducted that "the authorities of the hospitals should focus on all dimensions of KM to reduce the gap between the current status and the desired status" (31). Therefore, the hospital managers should have plans for implementing the KM program concerning all aspects of KM including Processes, People, and Technology.

Conclusion

Considering the importance of the KM, hospitals should provide sufficient knowledge. The wide range of KM from explicit knowledge to tacit knowledge, with attention to organizational cultures and gradual actions, can encourage the hospital staff to share their knowledge according to their respective specialties. The authors suggest that the hospital managers should use encouraging policies for users who voluntarily participate in hospital KM programs. Any optimized organizational action can somehow fit into a wide range of KM, adopting an appropriate KM strategy. An effective mix of People, Technology, and Processes can guarantee the hospital success. Because technology in the hospital is in a weak status, the authorities and hospital managers should make the necessary efforts to meet the hardware and software needs of the organization, and equip the hospital with health information technology tools. Also, due to the correlation between the People and Technology, equipping the hospital with new technology will increase the abilities of the hospital staff and improve the quality of health care services for patients by increasing the individual capabilities. Concerning the results of the study, for successful implementation of KM, it's suggested to involve all hospital staff in the KM program.

One of the most important limitations of the study was the high workload of the staff; to resolve this limitation, the participants were given a two-week time to fill out the questionnaire and making arrangements was labor-intensive.

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