

Knowledge Management (KM) Practices - A Study of KM Adoption among Doctors in Kuwait

B. Alajmi, L. Marouf, A. S. Chaudhry

Abstract—Knowledge management is considered as an important factor in improving health care services. KM facilitates the transfer of existing knowledge and the development of new knowledge in hospitals. This paper reviews practices adopted by doctors in Kuwait for capturing, sharing, and generating knowledge. It also discusses the perceived impact of KM practices on performance of hospitals. Based on a survey of 277 doctors, the study found that KM practices among doctors in the sampled hospitals were not very effective. Little attention was paid to the main activities that support the transfer of expertise among doctors in hospitals. However, as predicted by previous studies, good km practices were perceived by doctors to have a positive impact on performance of hospitals. It was concluded that through effective KM practices hospitals could improve the services they provide. Documentation of best practices and capturing of lessons learnt for re-use of knowledge could help transform the hospitals into learning organizations.

Keywords—Health Sector, Hospitals, Knowledge Management, Kuwait, Tools and Practices.

I. INTRODUCTION

KNOWLEDGE management (KM) is considered as one of the key elements in enhancing organizational effectiveness and efficiency. The significant impact of knowledge management lies in the highlighted importance of knowledge as the fundamental basis for better performance and enhanced productivity. Thus, organizations that are capable of generating new knowledge, managing it, and applying it effectively will be successful at creating a competitive edge.

While the KM practices have been investigated and implemented in different organizations and fields, the adoption of KM practices in hospitals has been very challenging. The health profession is an intensive knowledge-based field that relies heavily on generating new knowledge. Thus, it is important to investigate KM practices used for managing existing knowledge among doctors, as well as regular activities for generating new knowledge. Understanding the different KM practices that best suit hospitals would assist doctors in particular and hospitals in general to improve their day-to-day activities by managing and delivering knowledge when needed.

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This study was aimed at reviewing KM practices in the hospitals in Kuwait. It investigated different activities for knowledge capturing, sharing, and generating among doctors in Kuwaiti hospitals.

For hospitals, Kuwait achievements are relatively comparable to average European standards of health and hospitals. This current level of health services was achieved through the generous welfare system and education attainments developed since independence in 1961. The State of Kuwait is keen to provide full and free-of-charge high quality health services to the citizens and to the residents through medical insurance. At present, the public healthcare system consists of 15 general and specialist hospitals and 94 clinics. The number of hospital beds is 6,714, and there are 6,473 doctors. On the other hand, the private sector is relatively small, consisting of 12 hospitals that have a total of 1038 beds and employ 885 doctors and dentists. The oil companies have three hospitals that have a total of 209 beds and employ 198 doctors and [13]. The complexity of the health sector and the Government's vision to provide better health care services for its citizens presents challenges that could be addressed by knowledge management practices and tools.

Acknowledging the complexity of the health profession and the important role KM practices play in capturing and generating new knowledge, the study focused on the following research objectives:

1. To survey practices of capturing, sharing, and generating knowledge by doctors in selected hospitals in Kuwait.
2. To identify tools used to support knowledge management practices adopted by doctors in Kuwaiti hospitals.
3. To investigate the perceived impact of knowledge management practices on the performance of hospitals in Kuwait.

II. LITERATURE REVIEW

Knowledge Management (KM) is the process by which people in organizations capture, share, and generate knowledge for action. Knowledge capturing, sharing and generating have been widely seen as an important strategy for improving the quality of healthcare services [2], [17], [18]. Leaders and executives in health organizations increasingly recognize that in order to maintain or gain advantages, organizational knowledge not only needs to be managed but also should be shared among clinical as well as support staff [16]-[19]. Thus, health-care organizations need to focus on practices and tools appropriate for knowledge capturing, sharing, generating and use.

The main purpose of this study is to survey practices of capturing, sharing, and generating knowledge by doctors in selected hospitals in Kuwait. Knowledge capturing is the process of identifying, codifying and storing knowledge in a readily usable and accessible form. Knowledge in organizations can be categorized into explicit and tacit. Explicit knowledge can be easily captured and managed. Tacit knowledge is highly personal and resides only in the mind of the holder which makes it hard to capture or be managed. Knowledge sharing is a communicative process by which expertise is transferred from one unit to another. The importance of knowledge sharing as an individual, as well as organizational, activity relies on the fact that knowledge sharing is often the basis of competitive advantage. It is important because it prevents “reinventing the wheel” [10]. It is a communicative process that prevents “knowledge loss” once an expert leaves and it ensures cultural stability and innovation.

As organizations interact with their environments, they absorb information, turn it into knowledge, and take action based on such knowledge in combination with their experiences, values and internal rules. Knowledge generating is the process by which organizations increase their stock of corporate knowledge through acquisition, adaptation, and social networks [6].

While amplifying KM practices, KM tools are becoming an important mediator in the way knowledge is experienced, described, processed, stored, retrieved, and distributed [20], [21]. Many studies emphasize the role of information and communication technologies (ICT) that are usually seen as valuable tools for mediating organizational communication and knowledge sharing. Such tools are often used to improve communication and create a more efficient “alternative organization [21].

Previous research adopted the Technology Acceptance Model to identify how physicians are using social media to share and exchange medical information with others, and to identify the factors that influence physicians’ use of social media as component of their lifelong learning and continuing professional development. Having adopted a quantitative approach, McGowan et al, received a total of 485 completed surveys. Among the respondents, 57% perceived social media tools to be beneficial, engaging, and a good way to get current, high-quality information. In terms of usefulness, 57.9% stated that the social media enabled them to care for patients more effectively and 60% stated that it actually improved the quality of patient care they deliver. The main factors influencing physicians’ usage of social media for sharing medical knowledge with other physicians are perceived ease of use and usefulness. From this study, it appears that the frequency of social media usage is influenced primarily by positive attitude toward the technology, perceiving that the technology is easy to use, and perceiving the technology be useful for achieving better performance outcomes [14].

In addition to the ICT infrastructure, the following channels also contribute to better knowledge management practices: *communities of practice* [5], [24]; *meetings* [25]; *training*, and

apprenticeship. Informal social networks – usually labeled as communities of practice – are effective for establishing the habit of sharing knowledge and for the embedding of processes and practices in the organization [5].

Group meetings are considered to be a useful environment for learning as well, since they allow team members to share information and learn about other domains relevant to their work [24]. For example, in many cases meetings are more efficient for the transfer of explicit knowledge [7]. There is a need for other types of activities that ensure the transfer of more complex knowledge such as “tacit” knowledge. Training and apprenticeship would allow the network members to efficiently transfer more complex—tacit and implicit—knowledge [7].

Reference [8] found that the challenge of taking advantage of knowledge sharing processes and tools is to integrate them with different aspects of the business: strategy, process, culture, and behavior—i.e., knowledge sharing processes and tools have to be “baked” into key work processes [6]. Major factors necessary to motivate knowledge sharing among organizations’ employees are an enabling environment and an appropriate organizational culture that significantly strengthens knowledge sharing success and stimulates and sustains success in the organization [1].

In a comparison of four high-performance and low-performance practices, Alajmi et al. found through an exploratory research a connection between investing in knowledge management tools and processes and healthcare practices. For example, the in-house training and teaching of staff in the high-performing practices were more formalized and documented than those in the low-performing practices; the latter seemed more likely to depend on on-the-job training and observation. On another level, the lack of manuals and procedures was very obvious in the low-performing practices. Staff members depended primarily on individual notes to provide guidelines on how to do their work. Most notes were developed by staff in training. The high-performing practices seemed to rely heavily on manuals and procedures for communication with each other, in addition to using updates about new decisions and meeting minutes [2].

While focusing on one specific knowledge artifact, Pascal et al investigated how shared care plans (SCP) and knowledge artifacts could serve as collaborative tools in healthcare practices, transforming primary care practices from directive environments into more collaborative environments than primary practices were in the past [20]. Among the preliminary findings of the TALK/DM study are these barriers to progress in implementing the SCP:

- Resource Constraints – No time was invested in developing a customized template.
- New Process in the Practice – No such process existed in the practice; therefore, this was something the organization was going to have to learn how to do from scratch.
- New Competencies to Learn – No MI competency in the practice, and so, providers and staff alike lack expertise

and confidence in using the KM techniques and MI methods.

- Patients Not On Board – No patients were actively engaged in creating care plans with providers and staff.

III. RESEARCH METHODOLOGY

A. Study Phases

This project was completed in two phases. The first phase was preparatory. In the first step, the initial framework of KM practices was developed from a literature synthesis. This was aimed at identifying major KM practices and tools utilized and implemented in hospitals in different regions. This synthesis helped provide a benchmark to be used in the study of KM in the hospitals of Kuwait. The second step in the preparatory phase consisted of a series of interviews with selected experts in the hospitals in Kuwait. This step was aimed at reviewing the tools and practices identified from the literature for their relevance in the Kuwaiti situation. Some adjustments were made to fit the list of tools and practices to Kuwaiti hospitals. These two steps assisted in preparing the data collection instrument for the second phase of the project.

The second phase of the study consisted of a survey which used a quantitative approach. Previous studies have indicated that a quantitative approach was considered more appropriate to reach a consensus on the most frequently adopted practices and tools [11], [23]. A questionnaire was used as data collection instrument for this phase.

B. Research Instrument

The questionnaire was divided into three main sections. The first section focused on knowledge management tools used to capture, share, and generate knowledge and included a listing of 13 different tools. As stated earlier, these tools were identified from previous literature and updated during interviews with experts in Kuwait. A list of channels more relevant for Kuwaiti health professionals was developed. The second section of the questionnaire included statements to reflect on different KM practices adopted and implemented by doctors in Kuwait. These focused on three KM practices (capturing, sharing, and generating). The last part of the survey listed a number of statements reflecting on the perceived performance of hospitals with regard to productivity and quality. These statements had been tested and validated in previous studies [23], [26].

C. Data Collection

In line with the requirement of the Ministry of Health of Kuwait, a request was sent to the Ministry's Research Committee for approval for collection of data from public and private hospitals in Kuwait. After receiving the approval, an official letter was sent to seven hospitals, inviting them to participate in the study. Three public hospitals and one private hospital agreed to participate. All doctors in these hospitals were asked to fill in the questionnaires.

A web-based questionnaire was sent to all doctors in these hospitals through different channels; 122 doctors filled in the online questionnaire. Out of these responses, only 60 were

considered valid for the analysis. To increase the response rate, printed copies of questionnaire were also distributed. On the advice of the hospital management, early morning meetings were considered to be an effective venue to distribute the questionnaires since all doctors working on the day of distribution had to attend this meeting. A team was sent to distribute and collect the questionnaires from the four hospitals during the specified time. Of 1500 doctors working in the sampled hospitals [13], 415 filled out the questionnaire. A careful review revealed that only 277 questionnaires were usable and valid for analysis with 27.6% response rate. A summary of demographic characteristics of participants is given in Table I.

TABLE I
 DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS

Demographics	Determinant	Frequency	%
Age (N=274)	Under 25 years	13	4.7%
	26-35 years	110	40.1%
	36-45 years	84	30.7%
	46-55 years	44	15.9%
	56-65 years	17	6.1%
	over 66 years	6	2.2%
Education (N=249)	MBBS/MD	89	35.7%
	Master's	92	36.9%
	Ph.D.	68	27.3%
Experiences (N=275)	Less than one year	15	5.5%
	1-3 years	33	12%
	4-6 years	42	15.3%
	More than 6 years	185	67.3%

Of those who completed the survey, 71% were male and 29% were female. Their ages ranged from 25 years to 66 years. More than 42% were Kuwaitis, while about 58% were non-Kuwaitis. The majority held graduate degrees—masters or equivalent, 36.9%, and doctorates 27.3%, while college/university degrees accounted for 35.7%. 85% were from public hospitals, while only 15% were from private hospitals.

IV. RESULTS AND DISCUSSION

A. Knowledge Capturing Practices

Knowledge capturing practices focused on the processes of identifying, codifying and storing knowledge in a readily usable and accessible form. Survey questions were designed by taking into account practices elicited from experts interviews conducted by research and the literature for knowledge management practices [26] and updated during interviews with professional health experts. A seven-item group of statements was created. These statements were rated on a 5-point Likert scale from strongly disagree (1) to strongly agree (5).

Overall, there was a general agreement on the lack of knowledge capturing practices in the sampled hospitals. Respondents rated knowledge capturing practices low in term of the availability of a place to capture and store ideas and knowledge (mean=2.58) and availability of a user-friendly

system to codify and categorize knowledge (mean=2.34). Respondents also claimed to use IT to capture knowledge less frequently (mean=2.69) nor to systematically report projects or record good practices for future usage (2.68). Respondents evaluated their efforts to remember mistakes for future usage (mean=3.51) and to maintain available systems (mean=3.03) somewhat high compared to other practices, but gave their efforts to update knowledge in the systems lower scores (mean=2.84). A summary of knowledge capturing practices with means are given in Table II.

TABLE II
KNOWLEDGE CAPTURING PRACTICES

Practices	N	Means	St. Dev.
Use of knowledge capturing systems	270	2.58	1.349
Use of knowledge codification user-friendly system	268	2.34	1.293
Use of IT to facilitate knowledge capturing practices	272	2.69	1.475
Reporting of Best practices	271	2.68	1.349
Lessons learned	271	3.51	1.313
Information systems maintenance	271	3.03	1.406
Knowledge update	269	2.84	1.448

As shown in Table II, there is a general agreement on the absence of knowledge capturing practices in the sampled hospitals. In addition, previous studies emphasized the role IT plays in supporting knowledge capturing and storing. IT is the groundwork that facilitates the implementation of knowledge management practices. The absence of IT would definitely hinder KM initiatives [12].

Overall, Results in Table III show doctors heavily rely on patient medical records as their major tool to capture knowledge and patients' information. Other tools such as EMR, best practices databases and recording tools did not score high in usage and availability. A summary of their responses on the use of knowledge capturing tools is given in Table III.

TABLE III
KNOWLEDGE CAPTURING TOOLS

Tools	N	Means	St. Dev.
Patients medical records	273	4.07	1.249
EMR	258	2.90	1.591
Best practices databases	258	2.42	1.453
Shared database/file servers	257	2.32	1.420
Recording tools	253	2.06	1.344

Correlation analysis was done to investigate the relationship between knowledge capturing practices and performance of hospitals as perceived by doctors about how their hospitals were doing with regard to productivity and quality. Knowledge capturing practices were significantly correlated with performance ($r=0.707$, $p<0.01$), demonstrating that the stronger the availability and use of knowledge capturing practices, the more likely doctors are to perceive their hospitals as more productive and quality oriented.

B. Knowledge Sharing Practices

Lee and Hawamdeh define knowledge sharing practices as the deliberate act in which knowledge is made reusable through its transfer from one party to another [9] (p. 50). To investigate the availability of knowledge sharing practices in hospitals, a six-item group of statements was created based on experts' interviews and previous studies on knowledge management practices [26]. These questionnaire statements were rated based on a 5-point Likert scale from strongly disagree (1) to strongly agree (5). The reliability in this sample was .8.

Respondents were asked to indicate the extent to which the hospital they work in facilitates knowledge sharing practices. Respondents rated knowledge sharing practices low in terms of availability of a system to find expertise and knowledge, a location to practice knowledge sharing activities, or an online space to interact and learn from each other (means=2.61, 2.67, 2.22). Respondents claimed that efforts to share knowledge among doctors, especially through face-to-face communication, is somewhat low (mean=3.41) especially when IT is not effectively used to supplement communications when face-to-face communication is not convenient (mean=2.8). Moreover, participation in societies and associations of specialties was also rated low (mean=2.80). See Table IV for summary statistics.

TABLE IV
KNOWLEDGE SHARING PRACTICES

Practices	N	Means	St. Dev.
Use of Experts database	273	2.61	1.376
Use of Knowledge sharing venues/locations	273	2.67	1.329
Use of Knowledge sharing online space	271	2.22	1.323
Face-to-face meetings	273	3.41	1.207
Use of IT to support knowledge sharing practices	269	2.80	1.331
Participating in societies & associations of specialties	270	3.07	1.385

Results in Table IV provide evidence of the low implementation of knowledge sharing practices in the research sample. Evidently, previous research proved that a structure which supports interpersonal interactions and eases face-to-face contacts could facilitate the organization's KM initiatives [12], [18].

In the sampled hospitals, knowledge sharing practices are not well implemented. When asked about the main tools doctors use to share their knowledge, respondents ranked mobile communication (mean=4.28) and face-to-face communication (mean=3.87) as the most used tools. All other major knowledge sharing tools did not score high in the results. For example, when asked about the frequency of using tools to share their knowledge, respondents rated email usage (mean=2.41), social media tools (mean=2.45), wikis (mean=1.69), online discussion forums (mean=1.58), and blogs (mean=1.36) strongly low in term of usage. A summary of responses is given in Table V.

TABLE V
KNOWLEDGE SHARING TOOLS

Tools	N	Means	St. Dev.
Mobile/Phone	273	4.28	1.123
E-mail	263	2.41	1.232
Blogs	238	1.36	.823
Online discussion forums	241	1.58	1.104
Wikis	229	1.69	1.254
Face-to-face meetings	261	3.87	1.258
Social media tools	233	2.45	1.444

TABLE VI
KNOWLEDGE GENERATING PRACTICES

Practices	N	Means	St. Dev.
Generating solutions & Interventions	271	2.73	1.264
Attending internal training sessions	271	2.94	1.271
Use of project feedback for work processes improvement	272	2.75	1.310
Converting knowledge into actions	271	2.81	1.300
Applying knowledge learned from mistakes	271	2.93	1.317

Overall, knowledge sharing is significantly low in term of practices and tools. The low implementation may be due to the lack of culture for promoting and encouraging knowledge sharing in the selected hospitals. As reported by respondents, work cultures in the hospitals did not encourage knowledge sharing practices. The relatively low scores (mean=3.0) seemed to indicate that doctors were less interested in sharing their expertise with other doctors in hospitals due to fear of criticism and judgment (mean=2.74) and low willingness to share (mean=3.83). The impact of culture on knowledge management practices was significantly proved by previous research. In fact, once cultural acceptance of knowledge management exists among organization members, it can become a promising sign for the success of KM initiatives [6], [12], [15], [17].

To test the relationship of knowledge sharing practices on doctors' perceptions of hospitals' performance, a correlation test was conducted. Knowledge sharing practices were significantly correlated with hospitals' performance ($r=0.373$, $p<0.01$). The correlation demonstrates that the stronger the availability and implementation of knowledge sharing practices in the hospital, the more likely it is that doctors perceive their hospital as productive and quality oriented.

B. Knowledge Generating Practices

Knowledge generating practices is the third pillar of knowledge management practices. To investigate knowledge generating practices a five-item group of statements was created. These statements were rated on a 5-point Likert scale from strongly disagree (1) to strongly agree (5). Reliability in this sample is .93. When asked about the extent to which hospitals are working toward facilitating and encouraging the generation and application of new knowledge to improve their services, respondents rated knowledge generating practices low in term of the existence of specific processes for knowledge generating (mean=2.73) and the availability of internal training opportunities (mean=2.94). In addition, respondents ranked the use of feedback from previous projects to improve work processes as a low knowledge generating practice (mean=2.75). On the other hand, as could be expected, respondents rated knowledge application and use practices as low practices especially with the lack of process for converting knowledge into improved services (mean=2.81) or processes for applying knowledge learned from mistakes (mean=2.93). See Table VI for summary statistics.

Results in Table VI proved a low implementation of knowledge generating practices in terms of activities and venues to facilitate the generating and creation of new knowledge, solutions, and interventions, as well as applying new knowledge to improving existing services.

On the other hand, respondents ranked tools for knowledge generating practices relatively low in term of usage. When asked how often doctors share their expertise and knowledge using the following channels, respondents reported somewhat frequent usage of channels to generate knowledge-like continuous medical venues such as seminars and lectures (mean=3.8), followed by morning departmental meetings (mean=3.57), feedback on cases (mean=3.42), and training programs (mean=3.31). Other types of knowledge generating practices such as communities of practice (mean=2.79), end-of-the-day departmental meetings (mean=2.78), and attending webinars (mean=2.33) were also listed. However, they were not much used. A summary of responses is given in Table VII.

TABLE VII
KNOWLEDGE GENERATING TOOLS AND CHANNELS

Tools/Channels	N	Means	St. Dev.
Feedback of cases	270	3.42	1.455
Morning depart. meetings	270	3.57	1.627
End-of-the-day depart meeting	250	2.78	1.525
Communities of practice	256	2.79	1.431
Continuous medical educational venues	274	3.80	1.144
Training programs	269	3.31	1.260
Webinars	260	2.33	1.375

Overall, knowledge generating practices are considered to be low in the sampled hospitals. These kinds of practices are not highlighted in the normal workday within the hospitals nor are they imbedded in the day-to-day routine. Apparently, hospitals do not recognize the importance of tools and channels for generating knowledge and sharing it among doctors; thus, knowledge generating channels were listed low in usage in the selected sample.

Perceived hospitals' performance was positively associated with knowledge generating practices ($r=0.690$, $p<0.01$). This demonstrates that the stronger the availability and adoption of knowledge generating practices, the more likely doctors perceive their hospitals as more productive and quality oriented.

V. CONCLUSION

Health care organizations are increasingly recognizing that in order to maintain or gain competitive advantages,

organizational knowledge not only needs to be managed, but also integrated with day-to-day routines [4]. Previous studies proved that knowledge management practices and tools could have a direct impact on organizational performance. This research aimed to review knowledge management practices and tools in hospitals in Kuwait and to investigate the impact of KM practices on hospitals' performance.

The study found that in terms of the three major knowledge management practices – knowledge capturing, sharing, and generating – the adoption of KM practices were rated very low in the sampled hospitals in Kuwait. Hospitals paid little attention to the main activities that support the transfer of expertise among doctors in hospitals. Location, systems, and online spaces to capture, share, and generate knowledge were lacking. The use of IT to support the documentation of knowledge and the transfer are not common among doctors. Evidently, doctors prefer to use face-to-face communication and mobile technologies to communicate and share knowledge. Other new media tools such as blogs, wikis, social media are not used by doctors.

As predicted by previous studies [22], [26], knowledge management practices were perceived to have an impact on hospitals' performance. Through knowledge capturing, sharing, and generating, hospitals could improve the services they provide through documenting best practices, transforming their hospitals into learning organizations in which lessons learned are captured, stored, and made available for others to learn from.

And even though in this research KM tools did not rate high in availability or usage, previous research emphasized the significant role knowledge management tools could play in improving hospital services through increasing efficiency and productivity by providing the necessary information and knowledge to those who need [3], [2], [6] found that the challenges of taking advantage of knowledge management practices and tools were best met by integrating them with different aspects of the business: strategy, process, culture, and behavior. In other words, knowledge management practices and tools have to be "baked" into key work processes. Major factors necessary to motivate knowledge management implementations are enabling environments and appropriate organizational cultures that significantly strengthen knowledge management practice and stimulate and sustain success in an organization [1], [8].

The implications of this study suggest a connection between performance and knowledge management practices and tools in hospitals based on doctors' perceptions. A continuation of the research is needed in order to gather quantitative and qualitative data in order to understand the main factors that hinder the implementation of KM practices and tools in hospitals in Kuwait.

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