

# Impact of KM Strategies on Hospital Performance

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## ABSTRACT

Knowledge management is the ability of an organization to use available knowledge derived from the experience and skills of its employees. The health care sector strives to deliver quality healthcare service, driven by expert knowledge. However, it has not been operating in a similar manner as the business sector in utilizing knowledge management to advance business performance through innovation and skill development to improve financial performance. Thus, to improve competency, innovation and performance, hospitals must utilize knowledge management strategies, particularly when it comes to offering quality healthcare to its patients. Hospitals are a knowledge driven environment, with this expert knowledge required to create knowledge for operational management and process activities. The transfer of knowledge among hospital staff at all levels is crucial to the ability of the hospital to provide a service, through use of knowledge management strategies like IT and people. A pilot study conducted in hospitals in Riyadh, Saudi Arabia suggests a need for knowledge management strategies, with emphasis on knowledge sharing among employees. This can be done through the provision of user-friendly IT platforms for knowledge storage, sharing and management. Hospitals should also encourage external knowledge acquisition via courses, workshops and lectures or expert visits. Furthermore, the pilot study indicates a gap in knowledge management and the implementation of knowledge management strategies in Saudi Arabia hospitals. Essentially, the application of KM strategies will improve the efficiency and performance of hospitals and other medical services institutions.

**Keywords:** Knowledge management, Efficiency, Health sector

## I INTRODUCTION

In the recent past, hospitals have been experiencing an upsurge in the magnitude of organizational and managerial pressures. This has been caused by increased competition, reduction of personnel, more governmental regulations than before, and an ever demanding customer. For the purposes of coping with these challenges, they have been implementing various management strategies. One strategy that has attracted much attention is knowledge management (KM). Many scholars have indicated that the use of this strategy has positive outcomes (Binney, 2007; Moballeghi & Moghaddam, 2011; Asdar, 2013). A wide range of qualitative and quantitative studies have been conducted to study the effectiveness of KM as a strategy to

improve organizational performance, both within hospitals and in other sectors of the economy (Ahn & Chang, 2004; Chang, Hsu, Li & Chang, 2011; Saaty, 2014). The following is a systematic review of the research conducted on KM in hospital settings. The objective of this paper is to examine the outcome of various studies and explain if their results support their hypotheses. In addition, a pilot study was conducted to measure KM and organizational performance in several hospitals in Riyadh, Saudi Arabia, using a survey.

### A. KM IN THE HEALTH SECTOR

Knowledge management can be broadly defined as the ability of an organization to use available knowledge derived from the experience and understanding of its employees, recorded information gathered on the long term, and the information technology that often goes with it. Knowledge management strategies have been applied globally in the business sector mainly to assess organizational performance and to establish competitive advantage in a technologically advancing world (Moballeghi & Moghaddam, 2011). Organizations are finding that it is critical to exploit the knowledge assets they have with regards to explicit and tacit knowledge, in order to be relevant and to manage efficiently, using both internal and external information resources (Gupta et al. 2000).

The healthcare industry is one of the most knowledge driven sectors (Bordoloi & Islam, 2012), yet, one that lags far behind in comparison to the business sector (Gómez, 2014). Essentially, this knowledge is driving the management process and when used well can be most effective in improving work processes in the health care environment (Nilakanta et al. 2009), particularly in healthcare delivery (Saaty, 2014). In the hospital setting, the most important outcome is to provide a quality healthcare delivery service through specialized knowledge (Chang et al. 2009).

In his study on the effect of KM on organization performance in hospitals, Saaty (2014) found that there is a significant relationship between the increase in KM and organizational performance and competitiveness in the health care sector. This result is similar to what is common in the business sector, where the use of KM and its effective management significantly improves organizational performance. Indeed, some studies have shown that KM has been useful in the ability to determine the capability of an organization to adopt to a changing environment at a recommended pace to that of its competitors. Knowledge management has been shown to increase motivation of workers, and in so doing increase organizational activity and efficiency ((Song Van Der Bij,

& Weggeman, 2005). This can be directly applied in the health sector where such activity would increase and improve health care delivery. Many researchers argue that knowledge management can be used to influence the dynamic capability of health care organizations (Greiner, B"Ohrmann, & Krcmar, 2007). This argument has only been hypothesized and not well tested through research (Saaty, 2014), although, there is a growing body of research in the issue of knowledge management and its effectiveness in the health care sector (Binney, 2001).

In a recent study, Kamariah, Idrus, Asdar, & Sudirman (2013), found that there was significantly strong relationship between knowledge management and dynamic capability in the performance of the hospital tested. This suggests that proper knowledge management has the ability to improve organizational adaptation and keep the organization competitive. In another study, Wu & Hu (2012) found that knowledge management was a significant predictor of effectiveness. They found that there was a significant interaction between capabilities of knowledge management and hospital asset's knowledge, as well as between knowledge management and process capabilities. This can be better explained by an example where physician uses their skill to treat a patient, but continue to learn from a new or effective treatment for the particular ailment as new therapies are introduced. Moreover, these aspects can also improve financial performance of the facility based on patient performance, and also improve service delivery to patients. Therefore, both knowledge capabilities and assets are important elements to improve both patient and financial performances (Kamariah et al. 2012). Essentially, effective knowledge management will have an indirect positive influence on the process capabilities, which will potentially improve its efficiency (Wu & Hu, 2012).

Saaty (2014) suggested that the health sector should focus on KM to improve intellectual capital, which is an essential tool in both improving and minimizing risks in innovation. Innovation is the direct product of effective knowledge management. Organizations that are utilizing their KM to acquire and organize, transfer information and expertise; as well as utilize this information for learning, development and innovation and in decision making, are likely to improve their performance (Gupta et al. 2000). For example, in a common day, a health care provider has to know more than more than 10,000 syndromes and ailments, more than 1000 laboratory tests, and the names and uses for up to 3000 different medications (Dunton & Montalvo, 2009). This knowledge is instrumental to the function of the environment and the effectiveness of health delivery and therefore needs to be managed in such a way that it benefits the hospital or particular health sector (Moballegghi, & Moghaddam, 2011). This also highlights the fact that there has not been additional knowledge generated in their field of expertise (Bose, 2004).

Studies in the literature on KM in the health care sector acknowledge the fact that there is an urgency to find a means to manage such knowledge (Chang et al. 2009). One of the mechanisms that have been proposed as a tool to manage such knowledge is through the use of knowledge

management strategies (Ezzeddine, 2006). These strategies can have an effect on performance and thus are dependent on the manner in which they are implemented within the organization (Chen & Chen, 2006).

Knowledge management strategies can be broadly grouped into two parts, codification and personalization. Codification involves storage of information and knowledge by people into manageable documents, software, reports and as data in both soft and hard copy; while personalization involves information sharing between people, because people are highly involved in the dissemination of knowledge between each other. The strategies of knowledge management are the IT-centered strategy where the focus is on the storage, codification, documentation and sharing of information among individuals; Capture-based strategy that is used to ensure knowledge protection; Knowledge Sharing-based strategy which involves sharing and exchanging of information through tacit and explicit learning among individuals in the organization. This is most important because it allows the generation of new ideas and innovation, thereby, potentially increasing performance. The following strategies are likely implemented in an organization to improve access to knowledge as well as knowledge sharing in general: IT-centered strategy is crucial in the dissemination and storage of knowledge as well as in the accessibility of knowledge. This is also followed by the capture-based and learning-based strategies which both required a level of interaction among individuals in order to share knowledge and improve innovation and competitiveness through this sharing.

The organizational climate is driven by human beings trust, values, innovativeness, teamwork and their role in decision making. Similarly, the organizational processes will be integrated, executed and re-engineered in order to have an effect on the success of KM (Moffett, McAdam & Parkinson, 2003). Thus the need to implement knowledge management strategies best suited to the particular environment. In a health sector setting, Chen and Chen (2006) found that the characteristics of the knowledge management strategies strongly affected the implementation process. In their study, they found that the explicit knowledge strategy was effective for internal knowledge management acquisition. This implies that people have a greater impact on the outcome of a knowledge management strategy that is applied within an organization, more than the technological factors associated with the strategy (Haggie & Kingston, 2003). In another study, Chang et al. (2009) found that the implementation of knowledge management strategies was dependent on the characteristic of the knowledge, which affected the manner in which the knowledge management is implemented. They found that the explicitness of the knowledge affected its adoption in the internal-orientated knowledge strategy; while the complexity of the knowledge transfer was related to the external-orientated knowledge acquisition strategy. This study informs KM professionals that in a hospital setting, it is vital to match knowledge characteristics to the measures of implementation. It has been shown that all major processes

in a hospital setting are dependent on knowledge capabilities of all individuals involved (Kamariah et al. 2012).

In summary, it is important to note that knowledge management is affected by the type of knowledge strategy applied, which in turn affects the implementation process. Many researchers have found that knowledge management ultimately influences the effectiveness of service delivery in the health sector (Johannessen & Karp, 2010). There is growing research based evidence to support this. However, there is a growing need for healthcare professionals to understand KM strategies and how they can implement them into their organization for the best outcome.

## II PILOT STUDY

A pilot study was conducted to assess Knowledge Management strategies on hospital performance in Riyadh hospitals, Saudi Arabia. An initial survey was conducted among several hospitals and health care facilities: Al-Shemesi Hospital (Riyadh), The Military Hospital (Riyadh), King Faisal Hospital and Research Center (Riyadh), King Khalid University Hospital (Riyadh), Fresh graduate, KF, Maternity and children hospital (Mecca), Military Hospital (Al Taif) and Regional laboratory. The initial survey was piloted among 12 respondents to check for the validity of the questionnaire, and the study. This would ensure clarity of the questions posed in the survey-questionnaire. The data were explored in the Statistical Program for Social Science (SPSS) version 20.0 for the adjustments of several items before distributing it for the formal study.

## III DATA ANALYSIS

Validation of the questionnaire was conducted using the Cronbach's Alpha for reliability and convergent validity analyses on the four constructs of the survey. The Cronbach's alpha reliability coefficient ranges between 0 and 1, with values above 0.7 indicating good reliability. Spearman rank correlation was used to measure convergent validity by measuring the strength of the relationship between variables. Data were also presented as frequencies (n) and percentages to show the description of the data sample.

## IV RESULTS OF PILOT STUDY

The Cronbach alpha results showed that the questionnaire was valid and the four constructs of the questionnaire were highly reliable (Table 1).

**Table 1. Reliability analysis results (Cronbach's Alpha Scores)**

Constructs	Cronbach's Alpha
Knowledge management	0.782
Information technology	0.732
Organizational process evaluation	0.810
Organizational culture evaluation	0.767

Similarly, the spearman correlation coefficients indicated that there is a significant positive relationship between the constructs, suggesting good convergent validity (Table 2)

**Table 2. Results of Spearman's correlation coefficient for measuring convergent validity**

Items	Correlation coefficient range	P-value range
Child condition & Parents' feelings	(0.512 - 0.637)	(0.023 - <0.001)* (All significant)
Parents' feelings & Knowledge about NICU	(0.579 - 0.713)	(0.011 - <0.001)* (All significant)
Parents' feelings & Knowledge about neonatal care in the NICU	(0.556, 0.800)	(0.018 - 0.002)* (All significant)

\*: Significant at  $P \leq 0.05$

The sample comprised of 12 individuals that participated in the pilot study, of which 2 (16.7%) were males and non-Saudi, and 10(83.3%) female who were all Saudi in nationality, see Table 3). The majority were physicians, head of department at a health facility or worked at a health research facility (Table 3).

**Table 3. Demographic data of the employees**

Variable	n, (%)
Gender	
Male	2 (16.7)
Female	10 (83.3)
Nationality	
Saudi	10 (83.3)
Non-Saudi	2 (16.7)
Work place	
Al-Shemesi Hospital (Riyadh)	
The Military Hospital (Riyadh)	2 (16.7)
King Faisal Hospital and Research Center (Riyadh)	2 (16.7)
King Khalid University Hospital (Riyadh)	1 (8.3)
Fresh graduate	1 (8.3)
KF	1 (8.3)
Maternity and children hospital (Mecca)	1 (8.3)
Military Hospital (Al Taif)	1 (8.3)
Regional laboratory	1 (8.3)
Current job position	
Head of department	3 (25)
Supervisory management	1 (8.3)
Physician	2 (16.7)
Medical technologist	3 (25)
Doctor of medicine	1 (8.3)
Lab specialist	1 (8.3)
Nursing educator	1 (8.3)
Years of experience in current position	
1 - 3 years	3 (25)
3 - 5 years	3 (25)
5 - 10 years	3 (25)
More than 10 years	3 (25)

The results below show the responses of the pilot study participants on their Knowledge management, Information Technology, Organizational process evaluation, and Organizational Culture evaluation:

The majority of the participants when evaluated on their knowledge management said that there was no efficient system of IT in their health facility (16.7%) and no mechanisms of classification between explicit and tacit knowledge (16.7%) even though their hospital staff with trained skills on knowledge acquisition were available (16.7%). To gain new knowledge from external sources, staff participated in seminars (16.7%), conferences (25%), educational course (16.7%), journal subscriptions (16.7%), meetings (16.7%) and emails (16.7%) which were moderately or readily available within the health facility. Based on the participants, new knowledge from business partners was gained mainly from suppliers (33.4%). On the evaluation of knowledge management practice in the hospital, the participants indicated that they do not usually exchange knowledge with co-workers (25%), they do not usually have experts from outside to enhance their knowledge through workshops and seminars. Instead they generally rely on written sources (33.4%) and orally share information at meetings (33.4%). There was a mixed response from participants with regards to whether they believed that their knowledge can be considered as an organizational asset and not their own source of strength. Moreover, there were mixed responses regarding whether the hospital was a supportive environment for information sharing, or encouragement to improve knowledge by attending courses and conferences. The hospital also was found not to provide knowledge to new employees or to encourage the acquisition of knowledge, and also did not give priority to the application of knowledge management practices. The employees indicate that they rely mainly on own experience (25%), skills (25%) and their own knowledge (25%) in their work. Information sharing in the hospital or health facility was variable, with an equal show of sharing information mainly as project reports, hospital publications and reports.

On the information technology, participants showed mixed responses with regards to data storage. In some health facilities, IT was used to store data on tasks, implemented projects and activities, and equally in some health facilities this was not usually available. IT is generally used to store information about patients, suppliers and both; and yet in some health facilities this is not usually available. IT tools are not usually available in some health facilities, but where they are available they are generally user-friendly. The participants who have IT tools in their health facility indicate that IT tools are advantageous for the prevention of knowledge loss and improving patient care.

On organizational process evaluation, when asked to evaluate their hospital quality improvement projects many of the participants did not know or were unsure, the A/A system is available (16.7%), the hospital has indicators that calculate quantity and budget which declared periodically (16.7%). The health facilities generally use policies that aim to take advantage of mistakes but in general do not employ policies that encourage active participation of

employees in decision making in particular. However, hospitals do have mechanisms that allow feedback and suggestions from employees (16.7%), and there are special or responsible departments that manage the sorting, viewing and proposing of information for submission to relevant departments (16.7%) in most cases. The hospitals in general, have used the feedback from the employees as useful recommendations for management (16.7%). In some of the hospitals, administrative staff were rate higher for, evaluating the application of international quality standards (16.7%), discussing obstacles and challenges with employees, informing employees of correction plans, for having a system that regulates the objectives and development efficiency standards (25%), having indicators that calculate quantity and budget debate and declared periodically (41.7%). With regard to employee knowledge management, participants responses are mixed with regard to good work being rewarded accordingly and employees being prepared to take additional effort and work, but strongly agree that the innovative practices are rewarded accordingly (41.7%). Participants also show that the management encouraged their participation in formal education, informal education systems but were mixed with regard to the exchange of data, information and knowledge among hospitals. The participants generally had a good idea about research activities in the hospital and know about the hospital's performance.

With regard to organizational culture evaluation, the majority of the participants agree that their health facility provides efficient system for information technology that combines people, processes and technology. There is an indication that some of the health facilities involve employees in decision making processes (33.4%), however, participants show mixed responses about the supportive environment with regards to sharing of ideas among co-workers in the hospital, initiatives for knowledge exchange among teams and work groups or community practice. Based on this, it appears knowledge is highly individualized in health facilities in Saudi Arabia. There are also mixed responses about the way in which the hospital rewards its employees, largely with innovative practices being rewarded accordingly in most instances (25%). In general, employees are not happy with the reward system in their hospitals. Participants showed that the hospital is good for the distribution of knowledge among workers, connecting knowledge with employees, are highly stringent on the dissemination of academic research information, and generally the hospital applies a strategic plan for knowledge management, with a wide range application of knowledge management processes. From the mixed responses of participants when evaluating knowledge sharing among employees, it is clear that there is no knowledge sharing among employees. Similarly, mixed responses regarding leadership roles in the hospital suggests the management does not encourage knowledge gaining through external education or additional education activities that can improve knowledge at both the individual and institutional level. Management also does not encourage the sharing of knowledge among employees by creating an environment built on trust.

## V DISCUSSION

Mechanisms of knowledge management and implementation of knowledge management have been generally conducted in the business environment (L'opez, Pe'on, & Ord'as, 2004; Boateng, 2007). This system of knowledge management is crucial and needed in the health sector where its application is only emerging now with currently growing interest (Chang et al. 2011). Based on the growing research on knowledge management in the health sector, it is clear that decision makers should look up and implement these strategies which will assist in improving performance at both the individual and organizational level. From the results of the pilot study, it is clear that there is a need for proper establishment of knowledge sharing among co-workers in hospitals. The complete dataset will likely shed more light on the depth of this issue; however, if the hospital in itself does not encourage information sharing among expert and employees, this will negatively affect the performance of the organization as a whole. Saaty (2044) has shown that sharing of information among experts in some Saudi Arabia hospitals improved knowledge management gain, which in turn improved the implementation of knowledge management strategies and thus contributed to efficient and quality health delivery, which is the most important objective of any health facility. The health sector is extremely knowledge driven and filled with highly skilled employees. These skills are crucial to the function of the health facility and thus needs to be managed in a way that they are highly accessible, manageable and have an impact. Moreover, since experts have a need to protect intellectual property, there should be information sharing platforms that protect this intellectual capital. The result of the pilot study support this notion, since most of the participants indicated that there is no knowledge sharing among employees and that management does not encourage the sharing of knowledge among employees by creating an environment built on trust, where this information can be freely shared.

## VI CONCLUSION

The studies reviewed all support the importance of knowledge management in the health sector, and in general to any organization's success. If knowledge management practices are incorporated in the leadership of health centers, there will be significant improvement in the finances of the hospital as well as its ability to provide quality health services based on the high level expert knowledge in the environment. Our pilot study indicates that there is a big gap in knowledge management, as well as the implementation of knowledge management strategies in Saudi Arabia hospitals or health sector and service delivery. There is a need for knowledge management at all levels within health sector organization, with particular emphasis placed on knowledge sharing, storage and dissemination. Essentially, KM strategies improve the efficiency of hospitals and other medical services institutions.

## ACKNOWLEDGMENT

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