ABSTRACT

Healthcare has emerged as one of the most progressive and largest service sectors in recent times. But India’s healthcare infrastructure has not kept pace with the economy’s growth. Thus it becomes imperative that good management strategies such as Knowledge management are leveraged to make optimal utilization of resources and improved healthcare delivery especially in a developing country like India. There is a significant body of evidence that shows that experts such as Dwivedi et al. (2005) are now keen to embrace knowledge management tools and techniques to bring about the necessary change required for improved healthcare services. This paper attempts to study the various knowledge management practices, if any followed at GMC, Thanjavur and to explore their impact on learning and performance. Around 100 doctors were administered a five point Likert scale questionnaire which contains questions on knowledge sharing practices, learning and performance. The doctors were randomly chosen and 97 responses were received. The responses were statistically analyzed using SPSS software. The results showed that although Knowledge Management is not officially implemented in the hospital of Jammu, there are many practices which can be qualified as KM practices that are being followed by the medical professionals. These knowledge sharing practices received a mean response of 2.77, while the idea that Knowledge Management will lead to improved Organizational Learning received 3.28 and doctors agreed that this will better the performance received the response of 3.45. Moreover, the results show that Performance is a function of knowledge management and organizational learning (using regression analysis) and there is a significant positive relationship between Knowledge Management and Organizational Learning. The basic limitation faced in the study was the lack of general understanding regarding knowledge management amongst other staff such as Nurses and paramedical personnel and hence the questionnaire could not be administered to these groups.

Keywords-- GMC, Knowledge management, SPSS

I. INTRODUCTION

Healthcare is one of the key service sectors in today’s world and it is in the constant state of flux with ever changing technology, new findings and improved tools, new drugs and new methods of combating diseases. Experts agree that healthcare is one of the most knowledge intensive industries of the world and is potentially beneficial to the humanity as a whole. As a result countries and governments all over are focusing on this sector in the recent times. But India’s healthcare infrastructure has not kept pace with the economy’s growth. Thus it becomes imperative that good management strategies such as Knowledge management are leveraged to make optimal utilization of resources and improved healthcare delivery especially in a developing country like India.

Knowledge management

Knowledge management had always been a central question in human societies. Indeed, its roots are to be found in the early history of human societies. Philosophers, Western as well as Eastern, have focused their attention on the question of knowledge; already in ancient Greece, ‘scientific’ discussions often lead to philosophical debates, especially on the concept of knowledge. The creation of epistemology has finally formalized the question of knowledge; indeed, epistemology addresses primarily the question of “what is knowledge?” and discusses its creation and adoption. In the current discipline of knowledge management, philosophical considerations from several schools are taken into account, especially in the ontological knowledge management field (Grenon, 2003).

On the other hand, practical knowledge management has always taken place in the society, and transmission of knowledge was much related to the technical progress. Beginning in the middle age, knowledge transmission occurred under what was called “Wandergesellen” in Germany and “Compagnonnage” in France, where craftsmen and artisan take a tour of the country for 6 months or one year to learn from several masters. This was one of the first structured methodologies for tacit knowledge transmission. Knowledge first spread orally, then in writing; but it was restricted to a low circle of educated people till the
development of printing. If the first printing focused on religious and literature purpose, technical and specialized books began to spread after the wide adoption of the printing press.

II. KNOWLEDGE MANAGEMENT IN HEALTH CARE

While knowledge management systems use Information Technologies (IT) to manage the creation, storage, sharing, and use/reuse of knowledge; health care presents a special challenge to the use of KM such as system complexity, impact of medical errors, substantial growth of knowledge in the medical field, and an increased health care cost. We will overview each of these factors in the following paragraphs; then we will look at the role that KM can play in health care, its advantages and challenges; finally we will point at perspectives of health care KM.

Health Care System Complexity

The health care system is one of the most complex systems that we encounter in society (AndersonMcDaniel, 2000; Orr & Sankaran, 2007; Reinhardt, Hussey, & Anderson, 2004); it involves several partners working in diverse domains that need to collaborate in order to deliver care to a human being. Health care delivery involves health care professionals such as family physicians, specialists, nurses, radiologic technology technicians, lab technicians, social workers, psychologists, counsellors, etc. It also involves third parties such as hospital and clinic administrators, managers in finance, human resources, health care ministry, drug companies, health care insurance companies, activists groups, education organizations, research communities, etc. Besides; partners in health care delivery are dispersed around many geographical areas while they are acting on the same patient.

It is clear that the amount of knowledge, created by all of health care partners, is tremendous and that any knowledge created by one partner is of utmost importance to all others in order to deliver quality of care. The use of KM techniques in order to register and communicate and augment knowledge in health care sector is necessarily important. Nevertheless, the complexity of the health care sector presents a special challenge for the adoption of KM systems in health care, even though the impact of such adoption is expected to be tremendous (Bali & Dwivedi, 2007).

Advantages knowledge Management practices in health care

From the above it flows that KM can play important roles in health care. We will overview in the following the main advantages that KM can provide to health care delivery.

Medical Error Reduction

Knowledge management is able to assist in medical errors reduction, and consequently their cost, by providing a decision support for practitioners (Abidi, 2001). Case based reasoning and/or rule based reasoning can be used to attain this aim (Montani & Bellazzi, 2002). Already, knowledge management has been recognized as a tool used to cut the medication prescription errors; some cases report error reductions as high as 55% (Melymuka, 2002).

Cooperation and Innovation

In a complex field such as the health care, cooperation between the different health care providers is vital in order to deliver quality of care (ElliottO’Dell, 1999). Studies have shown that lack of cooperation in health care is a leading cause of many medical mistakes, hence the need for coordinated inter-professional care strategy (Inter professional Care Steering Committee - Health-Force Ontario, 2007). Thus, cooperative diagnosis can be achieved by the health care actors via the implementation of KM systems (Dieng-Kuntz, et al., 2006).

Besides, cooperation is a chance for innovation; this has been recognized by researchers and resulted in the creating of knowledge transfer networks (Ansell, 2007; Wickramasinghe & Davison, 2004). Furthermore, the health sector is a innovation driven field, hence management of clinical knowledge (Buchan & Hanka, 1997) using paradigms such as distributed knowledge management (Pedersen & Larsen, 2001) becomes paramount. In this perspective, innovation facilitation methodologies (Ansell, 2007; Canongia, Antunes, de Nazare, & Pereira, 2004; Fitzgerald, Ferlie, Wood, & Hawkins, 2002) as well as the analysis of knowledge flow barriers, in teams and organizations, should be tackled (Lin, Tan, Chang, 2008). Finally, discovering knowledge sharing mechanisms and organizational factors that influence them is essential for cooperation and innovation (Currie & Suhomlinova, 2006; Donaldson, Lank, & Maher, 2005; Elliott & O’Dell, 1999).

Quality of Care

Enhancing the quality of care is a major objective in all health research; therefore, finding, sharing, collaborating, and developing clinicians’ knowledge is necessary to discover and develop knowledge and hence quality of care. The adoption of knowledge management techniques is capable of enhancing the quality of care as suggested by Orzano et al. (Orzano, McInerney, Scharf, Tallia, & Crabtree, 2008).

Besides, the efficiency of work can be enhanced by adopting knowledge management techniques in day to day practice (T. H. Davenport & Glaser, 2002); these techniques have already proven their effectiveness in different domains such as health insurance (Chae, Ho, Cho, Lee, & Ji, 2001). Increased efficiency in personal health care delivery (Batalden & Splatine, 2002; Stefanelli, 2002) as well as in public health decision making (Goddard, et al., 2004) is also a factor that promotes a better quality of care.

Cost Reduction

While cooperation has an impact on quality of care which is seen the major aim of health care delivery, it has also an impact on cost since it allows sharing knowledge. Indeed, Lamont argues that regional health
information organizations aim to “increase cost effective use of health resources by sharing information among a coalition of providers, payers, employers and other stakeholders” (Driver, 2001; Lamont, 2007; McElroy & Firestone, 2005). Besides, we’ve already discussed the financial impact of medical errors and adverse drug effects, KM based decision making can help reduce errors; in fact, KM adoption in health care was driven in some cases by the high cost of medical errors (McElroy & Firestone, 2005) and KM will continue to represent a definite advantage in this context not completely explored.

**Knowledge Organization and Organizational Learning**

Knowledge is a major part of health organization’s day to day activities; whether for practitioners or for managers. For management it involves financial management, human resources management, organizational dynamics and governance, strategic planning, information management, risk management, and quality management (Garman, Burkhart, & Strong, 2006). For practitioners it is their major source of evidence to practice correctly; nevertheless, practitioners knowledge is not stable it evolves in time; in their systematic review of relationship between clinical experience and quality of care, Choudhry et al. (Choudhry, et al., 2005) argued that “Physicians who have been in practice longer may be at risk for providing lower-quality care”. Therefore, KM becomes vital to ensure evidence based practice for practitioners, and to ensure organizational learning for managers.

To use KM it is important to unveil (1) knowledge creation and transfer, (2) Knowledge needs, health professional roles, (4) information seeking behaviour, (5) Knowledge organization, and (6) Knowledge sharing behaviour.

To make use of knowledge it is important to understand the way knowledge is created (C.-W. Yang, Fang, & Huang, 2007) and transferred (Ansell, 2007; Bate & Robert, 2002; Dawes & Sampson, 2003; Dwivedi, Bali, & Naguib, 2005; Lahaie, 2005; Tagliaventi & Mattarelli, 2006).

Nevertheless, knowledge that cannot be accessed is of no use; hence, to facilitate access to health knowledge, health professionals knowledge needs (Burnett, Williams, & Webster, 2005), the roles they play in KM, as well as their information seeking behaviour (Dawes & Sampson, 2003) should be detected.

Finally, an ultimate aim in KM is to transform a health organization into a learning organization able to generate new knowledge, create knowledge systems, and base organizational actions on knowledge (Driver, 2001; Fiol & Lyles, 1985; Miner & Mezias, 1996). To achieve organizational learning an understanding of knowledge is important (Driver, 2001; Engeström, 2007) as well as the implementation of different approaches such as organizational memory (Abidi, 2001; Lahaie, 2005) that supports concept organization and sharing, across community members, in order to maintain collaborative work; or the a knowledge environment such as the Healthcare Enterprise Memory environment proposed by Abidi (Abidi, 2001).

Finally, in a multicultural, multilingual, or multinational collaborative health care teams. KM can play a role in terminology translation in order to overcome language and cultural barriers in the learning organization; this is of critical value to make sure that collaboration occurs in an unambiguous way (Kisilowska, 2006).

**III. RESEARCH OBJECTIVE**

The main objective is to study the various practices followed by medical professionals at Government Medical College, Jammu for the improvement of their knowledge and performance. It was decided to see if any KM practices re being used in this hospital and how they are impacting on learning and performance.

**IV. HYPOTHESIS**

H1: Knowledge Management and Organizational Learning are significantly related.

H2: Organizational Performance is a function of Knowledge Management and Organizational Learning.

**V. ABOUT SAMPLE**

Thanjavur Medical College (TMC) is one of the prominent medical colleges in Tamil Nadu, India. It is located in Thanjavur, Tamil Nadu and is affiliated with the Tamil Nadu Dr MGR Medical University, Chennai. It is one of the oldest medical colleges in Tamil Nadu and has a name on its own merit. It caters to the medical needs of districts of Thanjavur, Nagapattinam, Tiruvarur, Perambalur and Pudukottai. It is established & operated by Government of Tamil Nadu through Tamil Nadu Directorate of Medical Education.

Started with 650 beds in the 1960s, the college has emerged into an institution of higher learning in medicine and research with a bed strength of 300. Thanjavur Medical College Hospital is a referral teaching hospital. Proposals for starting a trauma care hospital and cancer hospital are pending with the government.

The initial intake for the undergraduate courses was a mere 75 boys and 25 girls which has today risen to 150, with the number of girls outnumbering the boys. All the departments have postgraduate degrees and diploma courses.

The Thanjavur Medical College Hospital (TMCH) and the Government Raja Mirasudar Hospital (RMH) are affiliated to the college. These hospitals are among the top notch hospitals in Thanjavur. They are known to provide medical and therapeutic services. In the year 2006-07, about 5864 major and 3747 minor surgeries took place in Thanjavur Medical College. The
Raja Mirasdar Hospital witnessed about 38065 surgeries in 2006-07. Trauma cases account for 90 percent of the inpatient admission daily in the hospital. This is a hospital.

The medical college campus covers an area of 1 km². It is located on the western edge of Thanjavur city. The Thanjavur Medical College Hospital is situated on the southern edge of the campus.

A new hospital complex at Thanjavur Medical College campus started functioning from the first week of June 2010. Constructed at a cost of Rs. 38 crore, the buildings include a 300-bed hospital, provisions for the functioning of all specialty departments, out-patient ward, laboratory buildings, etc. Hospital sources said that super-specialty departments to be shifted to the new buildings are Neuro Surgery, Neurology, Urology, Nephrology, Medical Gastroenterology, Surgical Gastroenterology, Thoracic Medicine, Oto-Rhino-Laryngology (ENT), Cardiology, Cardio Thoracic Medicine, casualty block, laboratories and all out-patient wards. Rajah Mirasudhar Government Hospital in town where ENT, gynaecology and paediatrics departments are functioning will be left only with gynaecology and paediatrics.

5.1 Methodology

A five point Likert scale questionnaire was used and it contains 62 items on knowledge sharing practices, learning and performance. The cronbach alpha value (which is a measure of internal consistency, based on the average inter-item correlation) was 0.928 signifying a good fit. Around 100 doctors were randomly chosen and administered the questionnaire. We received 97 responses. Initially, the nurses and paramedical staff were also provided the questionnaire but the pilot study showed they were unable to comprehend most of the items. That can be one of the limitations of the study. The responses received from the doctors were statistically analyzed using SPSS software.

VI. ANALYSIS AND FINDINGS

The initial analysis showed that although Knowledge Management is not officially implemented in the hospital of Jammu, there are many practices which can be qualified as KM practices that are being followed by the medical professionals. These knowledge sharing practices received a mean response of 2.84, while the idea that Knowledge Management will lead to improved Organizational Learning received 3.01 and doctors agreed that this will better the performance received the response of 3.45. See Table 1 below.

<table>
<thead>
<tr>
<th>No. of items</th>
<th>Means</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge Management</td>
<td>27</td>
</tr>
<tr>
<td>Organizational Learning</td>
<td>24</td>
</tr>
<tr>
<td>Performance</td>
<td>11</td>
</tr>
</tbody>
</table>

Some of the activities followed by doctors that can be classified as Knowledge sharing activities are:

“We use Manuals and Best practices regularly” This received the mean response of 3.01, while the item “In our department, lots of Group Discussions take place where we share our ideas and procedures received the mean response of 3.00. Similarly, “There are Morning or Evening Meetings in the department where we discuss the important events/happenings/cases quickly averaged 2.86. It was also seen that technology in terms of internet and journals are available to the doctors (mean response of 3.00) is satisfactory while doctors do believe that there is a culture of sharing and learning (mean response of 3.55) Based on these, it can be said that even though there is no hospital wide single system which helps to manage knowledge, individual and groups (departments) do carry out their own initiative in sharing and learning. For our first hypothesis:

H1: Knowledge Management and Organizational Learning are significantly related.

Using Bivariate Correlation analysis, we see that there is a significant and positive correlation between Knowledge management and Organizational Learning at 0.01 level. The Pearson correlation coefficient measures the linear association between two scale variables. See Table 2.

<table>
<thead>
<tr>
<th>KM</th>
<th>Pearson Correlation</th>
<th>Sig. (2-tailed)</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>OL</td>
<td>Pearson Correlation</td>
<td>.600**</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>.97</td>
<td></td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).
H2: Organizational Performance is a function of Knowledge Management and Organizational Learning. The author used Regression analysis. See Tables 3, 4 and 5 below.

As seen from Table 3 above, the R value is 0.509 – it is the multiple correlation coefficient between the predictors and the outcome. While $R^2$ is 0.259 and signifies how much the variability in the outcome is due to the predictors. The Durbin-Watson statistic value is 2.134 which is closer to 2. This informs us whether the assumption of independent variables is tenable. The closer the value is to 2, the better it is.

The Table 5 gives the model of relationship between KM, OL and Performance. As the t values are higher, sig values are less than 0.05, the model is a good fit. And it shows that Performance is a function of Knowledge Management and Organizational Learning. Thus the second hypothesis also holds good. The relationship can be written as

$$\text{Performance} = 1.450 + 0.239 \times \text{KM} + 0.329 \times \text{OL}$$

**VII. CONCLUSION AND SUGGESTIONS**

The above findings clearly show that there is a significant positive relationship between knowledge management practices and organizational learning. This was also previously agreed to by academicians who said...
that knowledge is manifested in learning and knowledge management and organizational learning are intricately related. Another study showed that knowledge management affects performance measures by enhancing learning, decision making, and task execution. This is similar to what was seen from the results of this study.

It is clear that Knowledge management is not officially implemented in GMC, Thanjavur and thus this study throws up a lot of implications for the future approach to improve hospital performance. There are lot of practices which are followed by the employees that fall under the knowledge sharing activities. The sharing of knowledge through conferences, seminars and lectures, exchanging information in departmental meetings, using internet facilities are some of the KM practices that make it easier for the medical doctors to exchange and improve knowledge. It can be said that even though there is no hospital wide single system which helps to manage knowledge, individual and groups (departments) do carry out their own initiatives in sharing and learning. This is an advantage since a culture of sharing already exists. What is required is an integrated effort from the top to formalize and centralize processes for quicker and easier assimilation for the users. A hospital wide database and centralized repository that is available at each department can be a good place to start with. The hospital can also go for step wise implementation by focusing on doctors initially and then gradually covering Nursing and other paramedical staff.

REFERENCES