

# Knowledge Management Processes to Support Evidence Based Practice in Healthcare – a Swedish Case Study

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## **Abstract.**

The primary and basic component of healthcare is information. When practitioners make decisions as well as treat and care for patients they interpret patient specific data based on evidence based medical knowledge. This process is complex as evidence is infrequently available in a form that can be acted upon at the time of care. Therefore the aim of this paper is to (1) explore how primary care, secondary care and municipality care in Sweden work with the process of managing knowledge, and (2) explore how practitioners experience access to medical knowledge. The results demonstrate major deficiencies in in the knowledge management (KM) process of the organizations. The KM process is not systematically reflected in the organizational culture, strategy or in practice, which causes major difficulties for practitioners to work according to evidence based medicine.

**Keywords.** Knowledge management, evidence based healthcare, healthcare knowledge management

## **1 Introduction**

The primary and basic component of healthcare is information. Being a practitioner involves using up-to-date medical knowledge and patient-related information to deliver the best possible care. When healthcare practitioners make decisions they interpret patient specific data according to evidence based medical knowledge [1, 2, 3]. This process is complex as decisions for individual patients must integrate the evidence with information about clinical circumstances, patients' preferences as well as individual experience of practitioners [4, 3, 2]. Basing decisions on medical evidence becomes even more problematic as evidence is infrequently available in a form that can be acted upon at the time of decisions [4]. Additionally, all too often practitioners need to explicitly search for the medical knowledge since this information is not integrated into existing information systems (IS).

Evidence based medicine (EBM) is defined as "the conscientious and judicious use of current best evidence in conjunction with clinical expertise and patient values to guide health [and social] care decisions" [5]. The definition emphasizes that EBM requires integration of 1) individual clinical expertise, 2) patients' values and

preferences as well as 3) the best available evidence in the decision making process for patient care. A slightly different definition of EBM is the one formulated by the Swedish National Board of Health and Welfare [6]. It argues that EBM involves combining current best evidence with clinical expertise and the patient's unique health situation and needs. One of the main differences with the definition given by Sacket et al. (2000) is that the Swedish National Board of Health and Welfare, in addition to the patient's values and preferences also emphasizes the patient's unique health situation as an important part of EBM. To understand the patient's unique health situation, we argue that practitioners must be provided with the patient's anamnesis at the point of care. Therefore, patient-related information is an equally important part of EBM as current best evidence. Especially given that practitioners make decisions by interpreting patient specific data according to medical knowledge [3]. Therefore, we argue that future IS must support (1) access to patient anamnesis as well as patients' values and preferences (2) access to the best evidence in the decision making process for patient care and (3) individual clinical expertise by supporting tacit knowledge.

Another major barrier to EBM, according to [7], is the time, effort, and skills needed to access relevant medical knowledge at the time when it is needed. Finding current and relevant medical knowledge needed to support daily clinical practice is a challenge, especially in view of the information explosion healthcare professionals are facing [4, 3]. Even for an up to date clinician, the problem of maintaining currency is immense as thousands of new scientific articles are published each month [7]. It is thus almost impossible for any healthcare practitioner to collect, read, systematize and evaluate all scientific literature on diagnosis and treatments. In order to better align evidence and clinical practice, many attempts have been made during the last few years to develop systematic reviews, medical guidelines and IT-supported knowledge repositories.

An acknowledged problem in the Swedish healthcare system is that current IT-based knowledge repositories are developed based on the need to disseminate knowledge about specific medical diagnoses to specific target groups with particular needs of information, knowledge and learning. From the point of view of practitioners the knowledge is fragmented. This means that a practitioner who needs to access knowledge about several specialties, which is often the case in e.g. municipality care, faces a suboptimal situation since she/he has to access several isolated repositories in order to find relevant knowledge for answering questions that arise [8].

This paper is based on a research project carried out in Swedish healthcare. The goal of the project was to investigate the possibilities to develop an IT-based knowledge repository that was intended to function as a single point of access to knowledge for healthcare practitioners in primary, secondary and municipality care. The target group for this "knowledge portal" was all healthcare professionals except physicians. As part of the project, the current KM processes in the healthcare organizations of a region of Sweden comprising 15 municipalities, 4 hospitals and a large number of primary care units were studied. The results are reported in this paper.

Extensive international research has been conducted regarding access to medical knowledge within the healthcare sector. However, much less is known regarding how practitioners in Sweden experience, availability of medical knowledge. In particular, no work has, to the best of our knowledge, addressed the problems experienced with

availability of medical knowledge by practitioners within the three levels of healthcare; primary care, secondary care and municipality care. Therefore, the aim of this paper is (1) to explore on how the three levels of healthcare worked with the process of managing knowledge and (2) explore on how practitioners experience access to medical knowledge where and when they needed it.

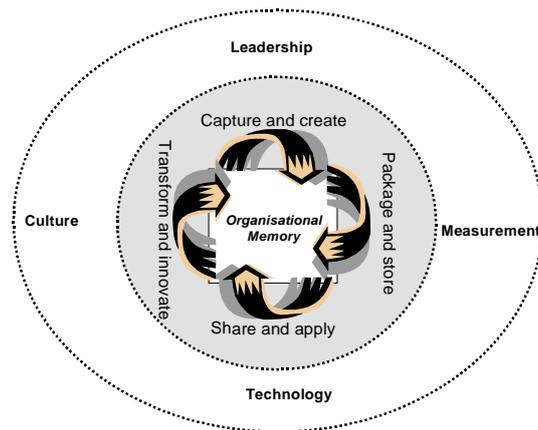
The remainder of this paper is organized as follows. In section 2 some theoretical background to the work is presented. Section 3 describes the research approach while section 4 presents the findings. The findings are discussed in section 5 in light of KM enablers. Finally, some concluding remarks and directions for further research are presented in section 6.

## **2 Theoretical background**

To achieve the goal of the paper, the theory of knowledge management (KM) and its relation to EBM has been used. KM is a broad, multidisciplinary field encompassing different approaches, such as EBM. KM can be defined as the process for capturing, storing, sharing and using knowledge. Within healthcare, KM is about capturing the knowledge that is critical to the organization. Knowledge in this context includes both the experiences and understanding of practitioners (tacit knowledge) and the information available inside and outside the organization such as, medical guidelines (explicit knowledge). Constantly improving the knowledge and making it available to practitioners when they need it, is critical for improving the quality of care delivered [9, 10]. KM in the context of EBM creates a learning environment and ensures that “best practice” is captured and disseminated. De Brún (2007) [10] emphasizes the importance of viewing KM as an extension to EBM, which draws on the documented evidence of treatment effectiveness to estimate the best care for the patient. Patients are individual and may react to treatments in different ways. Only practitioners are aware of these adverse incidents, and they need to make sure that this tacit knowledge is not lost, as it can improve the quality of care delivered. Identifying, capturing, documenting and passing the knowledge to other clinicians facing similar situations is therefore critical [10]. It is thus clear that healthcare can profit from many advantages that KM provide, such as; improved patient care, safety and satisfaction, team-building across organizational boundaries and more informed decision making by learning from others and building on individual experiences etc. [10]. The Swedish healthcare system, as the healthcare system in other countries, is facing significant challenges of delivering high-quality care, at lower costs. At the same time, there is growing recognition that healthcare organizations are knowledge-intensive and are suffering from information overload (11, 12, 13, 14). Therefore, the healthcare sector needs to embrace KM strategies, processes, tools and techniques [11]. This can support healthcare organizations to create greater value by delivering higher healthcare quality more cost effectively [11].

Hence, a general model for KM will be used to (1) provide an overview of how organizations within the healthcare sector work with knowledge creation and based on that how practitioners perceive availability of medical knowledge at the point of care and (2) discuss how KM enablers (leadership, culture, measurement and technology)

can support and facilitate the KM process in organizations so that practitioners can work according to EBM. The KM process developed by [15] as described in (Fig. 1.) will be used. The model covers the whole lifecycle of knowledge in an organization. The cycle is adapted from [16] and is similar to the spiral of organizational knowledge creation as presented by [17].



**Fig. 1.** The knowledge cycle in organizations (adapted from [15])

Organizations create a large amount of knowledge, e.g. when running day-to-day business operations and when improving existing work routines. To prevent knowledge loss, relevant knowledge needs to be captured. This might, according to [15] require thinking in abstract terms, building models and/or mind maps, or simply writing down the experiences. When relevant knowledge is captured, the next step is to package and store the knowledge so that it is available and can be used by those who need it in the organization. Knowledge that is stored becomes an important part of the organizational memory. When knowledge is documented and stored, it needs to be shared and applied. IT can be a powerful enabler for sharing knowledge, but it will not automatically make sharing happen. Therefore, a knowledge sharing culture supported by organizational leadership needs to be in place before IT can become an important enabler [15, 16, 17, 18]. Effective sharing and use of knowledge will stimulate innovation and, thus, improve existing knowledge and the creation of new knowledge [15].

### 3 Research Approach

The research was conducted in three steps:

**Literature review:** A preliminary review of literature describing related research was made, targeting literature from different research domains related to EBM and KM.

**Data collection:** A qualitative research method with interviews as our main data collection technique was used. 62 semi-structured interviews were conducted with managers, nurses and nursing assistants from primary care, specialist care and municipal healthcare. As indicated in the introduction of the paper, physicians were excluded at this stage in the research. The interviews were recorded and lasted approximately one to two hours each. The interview guide with associated questions was developed based on the KM cycle (Fig. 1), which means that the following aspects were addressed:

- Processes for capturing and creating knowledge
- Processes for packaging, storing, sharing, applying and measuring knowledge.

Two interview guides were created; one for managers and one for non-managers. The non-manager interview guide also included questions about potential lack of medical knowledge in specific clinical situations and how they handled the situation when this happened.

**Data analysis:** the recordings were transcribed into written documents. Analysis of the documents was inspired by grounded theory [19], was then conducted in two steps:

- Open coding: Concepts/categories were generated based on a deeper understanding of the interview documents.
- Axial coding: Categories that emerged from open coding were reviewed in detail. When a deeper understanding of the categories occurred, a description of each category was made.

## 4 Findings

The results from the interviews will be presented in section 4. according to the activities in the knowledge cycle (Fig. 1).

### **Capture and Create**

Knowledge creation involves developing new knowledge or replacing existing with the organizations explicit and tacit knowledge [20]. Knowledge is according to [21] created, shared, amplified, enlarged and justified in organizational setting through social and cognitive processes e.g., reflection, as the tacit and explicit knowledge is shared and converted [17]. A practitioner's tacit knowledge includes, e.g., clinical experiences, insights, judgments and intuitive problem-solving skills. This knowledge is an important part of EBM and a well-recognized alternative to evidence based knowledge [9]. Practitioners within primary care, secondary care and municipality care exchanged tacit knowledge through informal and formal networks, which involved day to day interaction between people within working environments e.g., within a clinical situation and during breaks, but also during joint activities such as meetings, seminars and conferences. They shared tacit knowledge by, e.g., assisting each other in terms of providing practical insights into "what solution/solutions will work in a particular situation, why it will work, and how to make it work". Through interaction practitioners obtained new insights that resulted in the creation of new knowledge. In other cases tacit knowledge was transferred from one member to another through discussions. Usually, important insights and relevant tacit knowledge

that was transferred from one practitioner to another was not captured despite that the knowledge could be captured and were of importance to the organization. If practitioners converged to solve a complex clinical situation related to a specific patient, this knowledge was usually documented. However, the interviews have shown that nurses and nursing assistant usually converge when a complex clinical situation in the organization occurs and that requires an immediate solution. The organizations had thus failed to establish a common space for creating knowledge. There were, for example, no dialogue meetings or collaborative settings in place with the aim of creating a common place in which individuals share experiences, which later on could be captured if relevant. Another significant problem encountered is lack of collaborative relationships with practitioners from other units within and outside the organization. Practitioners requested collaborative settings where they could share experiences, gain new insights and create new tacit knowledge and capture explicit knowledge through interaction with other practitioners. The problem was particularly evident in municipality care and secondary care. A majority of the nurses, assistant nurses and managers asked for cross-communication and collaborative settings that facilitate sharing and collaboration. There was a clear need to share experiences regarding “how others solve a specific clinical situation”. Collaborative settings were especially important for nurses in municipality care as they usually work alone in their function that comprises treatment, counseling, supervision, and caring, with limited opportunities for daily contact with physicians. The situation is somewhat different in secondary care and primary care where the specific clinical situation requires close cooperation between nurses and physician. Furthermore, several of the nurses within the three levels of healthcare expressed a concern regarding the lack of a culture among nurses and assistant nurses to share knowledge and collaborate between departments within and outside the organization. This type of culture was believed to be more inherent among physicians. They also express a feeling of injustice since they believe that the organizations generally prioritize and provide enablers for physicians to connect and share the deep, rich, tacit and explicit knowledge they have. The situation is also emphasized by managers. They argue that there is a tradition among physicians, that is not found among nurses and assistant nurses, “to connect people”, to develop and cherish collaborative relationships with other physicians by e.g., holding lectures, educating and sharing new research findings among each other and by participating in conferences. It is also common that physicians have internal training 1h/ week where experiences are shared through face-to-face interactions and where tacit knowledge is converted to explicit knowledge and shared among other practitioners through the process of dialogue and collaboration, an approach that unfortunately is missing among nurses and assistant nurses. Additionally, the managers emphasize that the effect of joint activities, especially seminars and conferences is not ideal, due to delays in knowledge creation, capture and knowledge transfer. Effective means that facilitate dialogue and collaboration between employees are highly requested. The managers further argue that physicians and nurses are good at sharing tacit knowledge during joint activities, but less efficient at knowledge sharing in the day to day practice. And if knowledge sharing occurs, it is usually among colleagues within the department, and not entirely surprising knowledge is often shared between individuals within the same professional category. However, during this study, some nurses in secondary care

gave examples of physicians who saw the importance of sharing their experience with nurses and assistant nurses, but these examples were few.

The capture of tacit knowledge has also been shown to be problematic, as the three levels of healthcare do not have defined processes for how important tacit knowledge can be captured, packaged and stored. Interviews with practitioners in municipality care have, however shown, that nurses and nursing assistant try to document important tacit knowledge related to a specific patient. Otherwise, codification of this knowledge type is sporadic. The same problem is found in secondary care and primary care.

The creation of new explicit knowledge from existing explicit knowledge (e.g., reports) is also an important process of knowledge creation [20]. However, capture of explicit knowledge within and outside the organization, especially within the municipality care was seen as challenging. One of the key challenges was to capture new relevant explicit knowledge from outside the organization. Not knowing where to find explicit knowledge and what type of knowledge that was relevant for the organization was a common issue. Capturing of explicit knowledge in the three levels of healthcare was mainly done through (1) *individual responsibility of managers and practitioners* and through the (2) “*medical nurse in charge*” (*MNC*). Individual responsibility means that each assistant nurse, nurse and physician are responsible for capturing important knowledge in their subject area from inside and outside the organization and disseminate it among the organizational members. This was, however perceived as challenging. Initially, the focus for identifying knowledge needs was based on employees’ individual learning needs and not according to the needs of the group/organization. Furthermore, nurses in municipality care and secondary care experience the capture of new knowledge as challenging and time-consuming as the knowledge is dispersed and stored in various autonomous IT-supported knowledge repositories at local, regional and national levels. As these IT-supported knowledge repositories are not comprehensive the nurses experience that important knowledge is overlooked and therefore difficult to capture. It was further shown that knowledge, usually was dispersed and scattered throughout the organization and in different locations both outside and inside the organization, which led to conflict among practitioners as they accessed different and contradictory information. This can of course negatively impact on the quality of care. To simplify access and ensure application of knowledge, delivery of patient care, practitioner expressed an urgent need to integrate knowledge sources with patient record systems and to develop one comprehensive IT-supported knowledge repository that is common to all three levels of care. Furthermore, nurses, particularly in the municipality care, experience stress and worry about not being able to capture and access relevant knowledge at the right time, at the right place and in the right format as only one of ten municipalities paid for access to scientific databases. Stress and anxiety were more pronounced among nurses within the municipal healthcare than for nurses in secondary care and primary care, due to the fact that they work closer to physicians and have better access to scientific medical knowledge. Nurses within primary care have a national web-based knowledge portal that they use to acquire explicit knowledge. Therefore, the individual responsibility for capturing explicit knowledge was not perceived as problematic among them. It was further shown that capturing of explicit knowledge, based on an individual responsibility within

secondary care, primary care and municipality care occurs sporadically. Reasons for sporadic coverage of knowledge are lack of enablers such as IT and culture. Lack of time, effort, interest and skills needed to access the right knowledge at the right time among the massive volumes of research being produced are other identified reasons. Furthermore, practitioners argue that they are not given the time they need to capture and store their knowledge e.g., document their lessons learned.

Assistant nurses also have an individual responsibility for capturing knowledge. Unfortunately, it has been demonstrated that 89 % of the interviewed assistant nurses felt that their individual responsibility for capturing knowledge, particularly evidence based research, is not relevant to their profession. Instead, they rely on other professions such as nurses and managers to provide them with relevant knowledge. An additional obstacle to the nursing assistant's individual responsibility that has been identified is (1) lack of knowledge and experience in searching for scientific, medical knowledge and (2) lack of knowledge of what characterizes a scientific source. The assistant nurses who felt that the acquisition of knowledge is just as important for a nursing assistant as for a nurse or physician believes that the organization has failed to create an environment that supports capturing and sharing of knowledge e.g., there is a lack of supporting information technologies and culture.

"Medical nurse in charge" (MNC) is a nurse who has the primary medical responsibility of the department. The MNC is also responsible for capturing, storing and disseminating explicit and tacit knowledge that may be relevant to other nurses and nursing assistants. The created and captured knowledge is often packaged in a word document, stored on the intranet and/or printed out and saved in a binder. To impose responsibility for the capture of knowledge on a single person, as in this case the MNC, has proven to be somewhat problematic especially if the MNC is on sick leave.

Managers also have an important role in capturing, storing and disseminating knowledge. Knowledge outside the organization was captured e.g., by central directives and organization-wide collaboration. It is evident that there is a tendency among both managers and practitioners to focus the capturing of explicit knowledge from outside the organization. The tacit and explicit knowledge inside the organization does not seem to get as much attention. Perhaps the knowledge inside the organization is taken for granted and/or harder to capture? There was only one department at secondary care who consciously worked with the capture and creation of knowledge from inside the department. Both the managers and the practitioners were aware of the importance of the tacit and explicit knowledge that exists within the organization. They have for two years been working to capture, create and package relevant knowledge in word documents that are now stored on the intranet. However, they experienced some major difficulties; (1) difficulties in knowing where new explicit knowledge inside the department is shaped, (2) knowing how to capture tacit knowledge, and (3) knowing what knowledge within the organization to capture and (4) dealing with limitations with regard to how the captured knowledge was presented on the intranet. The collected knowledge presented is merely a transition from paper-based to electronic documents where the information is distributed in text and book form e.g., structured in a hierarchical and linear manner, making it difficult for practitioners to filter unnecessary information. Also, this type of structure focuses on gathering of medical knowledge rather than on learning.

### **Package and Store**

While organizations capture, create new knowledge and learn they also forget acquired knowledge. Therefore, the storage, organization, and retrieval of organizational knowledge (also referred to as organizational knowledge) constitute an important aspect of effective KM [20, 15]. Knowledge residing in various forms such as written documentation, information stored in electronic databases and in organizational procedures and processes becomes an important part of the organizational memory. There is an iterative relationship between this process and the previous one. The key element in this process is according to [15] to make the specific knowledge useful and easily accessible to those who need it.

The results from the interviews have demonstrated difficulties with the packaging and storing of knowledge. One aspect is how knowledge is packed and represented. An important issue identified is that knowledge shared through manuals is difficult to absorb since the documents, in essence, are not adapted to the target group. Physicians often write them without keeping in mind that other professional groups such as assistant nurses will use them. A further complicating factor is that information is stored in variable form and in different knowledge artifacts, e.g. on the computer, on the intranet, in different knowledge repositories at national, regional and local levels, and in folders. There are thus no defined routines for how and where specific information should be stored. The results also show that captured knowledge is rarely adapted to the target group, nor is the knowledge given a relevant representation. Knowledge that has been created and captured is usually packaged in word documents. The use of multi-media such as moving pictures (film and animation) and sound is hardly ever seen. Practitioners have emphasized the importance of adapting the chosen representation form to the specific type of knowledge.

Furthermore, managers and practitioners emphasized that tacit knowledge is the most important knowledge, but unfortunately this knowledge is often not written down. Additionally, “who knows what” and where the knowledge sources can be found is also not documented. Nurses and assistant nurses argue that this is not a significant problem as employees “talk to each other”, and thereby becomes aware of “who knows what”. Managers, however, do see this as an organizational problem that needs a solution.

### **Share and Apply**

An important part of KM in organizational settings is the sharing and use of knowledge. However, this process is not simple as organizations often do not know what they know and/or they have weak systems for locating and retrieving knowledge that resides in them [20]. Knowledge can be shared through different channels. As discussed earlier, formal channels are used for sharing knowledge. However, informal channels such as unscheduled meeting and informal seminars *with the aim of sharing knowledge* are rare among nurses and assistant nurses. This is more common among physicians. Training is a common way of disseminating knowledge, but practitioners claim that training must be supplemented by other systematic efforts to ensure sustainable uptake of knowledge. The most common method used is that one or more practitioners are trained in a specific subject and are then expected to disseminate relevant knowledge to colleagues. However, this process has proven to be problematic as knowledge gained from training often remains within the person who underwent

the education and tends not to reach other individuals in the organization. Experiences and insight from the training is usually presented orally and are rarely documented. Additionally, it is difficult for managers to determine how much of the tacit knowledge gained from training is shared among individuals. Hence it is difficult to see the effect of the training e.g., have the employees brought with them new knowledge to the organization?

IT is used within the three levels of healthcare as a “push-pull” approach. The push approach is characterized by a desire to capture knowledge in central repositories and then push it out to the organization, in this case by email, intranet and in conjunction with meetings [16]. If a manager captured knowledge, e.g., from an external repository that they perceive as important for the organization a web-link was sent to employees by email and stored on the intranet. Nevertheless, in two municipalities, this was somewhat problematic, as assistant nurses did not have a user account that gave access to email. Again, in this situation managers and nurses had to communicate important knowledge orally to assistant nurses. Additionally, sharing is also dependent on the “pull” approach. This approach expects people to seek the knowledge they need, when they need it. This philosophy puts the responsibility with practitioners to seek out knowledge themselves to improve the performance of [16]. As discussed previously the practitioners’ lack of interest, time, effort, skills needed and lack of adequate IT-support prevents a successful “push-pull” approach. This is highly worrying, as a successful and effective knowledge sharing and application is critical for **transformation** and **innovation of knowledge** - improvement of existing knowledge and creation of new knowledge [15].

Moreover, managers in secondary care and to some extent in primary care express difficulties to assess whether employees have embodied and applied the disseminated knowledge. Some managers even mention that explicit knowledge that have been captured from the outside organization is comparable with a “temporary and sudden rain of knowledge that washes through the organization without knowing if someone has embraced the new knowledge”. Also, managers in municipality care perceive that monitoring the compliance to new knowledge that is implemented in the organization is difficult. The majority of the municipalities has no specific processes developed for monitoring compliance. Sporadic follow-ups are common in the majority of municipalities, and are conducted through verbal feedback from the nursing staff regarding her/his experience of how other medical staff follows new medical guidelines. Practitioners, on the other hand, perceive that embodiment of explicit knowledge is difficult as there is a lack of supporting culture, environment, skills and IT.

## 5 Discussion

In this section the findings will be discussed in light of essential KM enablers.

As shown from the interviews there is an urgent need for the healthcare organizations to capture, package, store, share and apply knowledge. Especially given that the enablers presented in Fig. 1 (leadership, culture, technology and measurement) are a precondition for creating a supportive environment for knowledge

transfer are not in place. Even if all of them are important, there is one that is more essential and more difficult to alter, namely, organizational culture [16].

The interview results imply that the culture and lack of adequate IT support are the main challenge to effective KM within the three levels of care. Unfortunately, there is no natural tendency in the organizations to share and collaborate. Therefore, to ensure good practice and an effective knowledge transfer that makes a difference in the organization and on the quality of care, one must connect people who are willing to share the deep tacit knowledge they have. Once people start sharing and this becomes a natural part of the organizational processes, enablers like technology can be provided [16]. A culture that encourages communities of practice, sharing and group learning thus helps KM initiatives. Additionally, it seems that some practitioners, especially the majority of assistant nurses, lack motivation for capturing, sharing and applying knowledge. This seems also to be an aspect of culture that is specific to the studied organizations. People need to be convinced and believe that the ability of practitioners to learn and to convert this learning into action is an individual responsibility and important for achieving good quality care [22]. An organization can create a knowledge sharing culture through effective knowledge hubs. Nevertheless, what is the point if practitioners are not motivated to participate and are not convinced of the benefits of knowledge sharing and taking a responsibility for their own learning? To tackle the problem, [16] recommend a so-called "*social contract*". This could be a way forward. The contract emphasizes that employees are responsible for the growth of knowledge within their field, and the organization is responsible for providing them with tools to enable growth. This contract has to be "two-sided". If managers require individual commitment and responsibility, but provide nothing in return, employees are going to balk at cooperation [16]. It is also important that managers convey that all professional categories are equal and central to the organization and its ability to deliver high quality care. We further argue that it is important that EBM is discussed in greater extent among assistant nurses in order to stress that they also are responsible for working according to evidence based medicine. Many of the interview respondents argue that because of poor wages, lack of career opportunities and especially lack of recognition in combination with low status and working conditions, assistant nurses lack motivation and do not see the importance of engaging in KM activities. It is evident that there is a need for a change in how assistant nurses view their professional role. The question is who is responsible for changing this view. Is it managers' responsibility or is it the responsibility of educational institutions? We believe it is the combination of both. We further believe that practitioners, even assistant nurses, want to share, and like to see their knowledge used by others, and also want to help their colleagues, but there needs to be some kind of *reward system* in place before sharing becomes a natural part of the organizational culture. Increasing practitioners' perceived *individual usefulness* of sharing is thus critical. However, individual capturing and sharing of knowledge must be recognized and supported by the culture otherwise rewards will not have much effect [16]. Additionally, practitioners must be given *time* to manage their knowledge. The interviews have shown that practitioners are obligated to reflect each day about what they have learned, however, they have no time set aside for reflection and documentation. Documentation of their lessons learned will work only

if they are given time to document knowledge during working hours and if they understand the importance of the documentation.

Also here it is important for managers to highlight the individual usefulness of managing individual knowledge e.g., by acknowledging the positive work in various ways. Practitioners' *KM skills* needed to perform the activities of KM are also critical. Having skills in the KM process is about (1) facts - know what to do, (2) ability - knowing how something should be done, (3) understanding - why something must be done, and (4) familiarity - know when something should be done. Managers need thus to educate practitioners on how they can make tacit knowledge explicit, how they can capture tacit and explicit knowledge within and outside the organization and how they effectively can communicate captured knowledge to other colleagues. One challenge here is the fact that also managers in the studied organizations lack these skills. They also need support and education.

To reinforce the knowledge sharing culture and the individual responsibility, leadership is critical. Managers must participate in sharing and showing employee that he/she is personally committed to learning as sharing and using best practice is the most important individuals within an organization can do [16]. Managers most constantly talk about the importance of shared learning during meetings. They must motivate employees to share and especially they must show employees' how to capture, share and use knowledge throughout the organization by giving people self-service tools. The Chinese proverb fits well here; *"Give a man a fish and you feed him for a day. Teach a man to fish and you feed him for a lifetime"*. Thus, in order to encourage sharing, managers should not just hand out the web links where knowledge can be found - give the fish. Instead, they must teach by giving employees the right tools to capture and disseminate knowledge – thus teach them how to fish. This approach is especially critical as practitioners during the interviews emphasized that they wanted to share but simply don't know how. Moreover, it is equally important to encourage practitioners to teach each other – learn each other how to fish. For this to work collaborative relationships within and outside the organization must be developed e.g., by forming teams that accumulate knowledge based on common goals.

As seen from the interview results, practitioners lack access to adequate IT-support for accessing and sharing knowledge. This is a critical issue that needs to be managed as KM relies on effective information technology to ensure that practitioners can communicate and manage their knowledge. However, IT can only become a central enabler of KM if the technology is used with intelligence, where specific knowledge types and needs are given the right IT application [16]. Based on the issues identified in this study information technology such as a Process Support System (PSS) presented in [23] can be implemented to improve quality of care and enable practitioners to work from EBM, by providing timely access to up-to-date patient-related information - matched with relevant structured medical knowledge and with an IT-supported knowledge repository.

To ensure that best practice is used throughout the organization comprehensive planning is required. Knowledge needs in relation to the organization's mission and goals, both short and long term, combined with the employees' individual knowledge needs must be clearly defined. This is particularly important as the focus for identifying knowledge needs and implementing knowledge was based on employees'

individual learning needs and not according to the organization's mission and goals. Also infrastructure and processes for supporting these goals need to be systematically planned. It is critical that the infrastructure reflects KM goals so that plans can be effectively implemented. To ensure successful implementation, ongoing *monitoring* and *measurements* of knowledge transfer are required [22]. It is equally important to clearly define expected outcomes of applying relevant knowledge. The managers within the three levels of healthcare emphasized the importance of measurement, but they argue that this does not work in practice. Not knowing what to measure, for what purpose and how to measure it are common issues.

## **6 Concluding Remarks and Future Work**

A crucial role in the practice of evidence-based medicine is healthcare practitioners' possibility to access evidence based medical knowledge at the time when they need it. In accordance with current research, this study has confirmed that practitioners lack access to evidence based medical knowledge when preparing and conducting patient visits, as well as when making decisions about the care of the patient. The study has also shown that the healthcare organizations that participated in this study have not implemented a systematic KM process. Furthermore, the findings have confirmed that the main barriers hindering the adoption of KM in healthcare are related to people and organizational culture. Managers that support and motivate employees to share knowledge and especially show employees how to capture, share and use knowledge throughout the organization is integral to the success of KM. Managers cannot expect that sharing of knowledge "takes care of itself". For practitioners to share knowledge, they must be led by a manager who is personally committed to learning and sees sharing and using of best practice as a critical part of the quality of care. Additionally, managers must show all practitioners within the organization that the use and sharing of knowledge require commitment of all practitioners, as everyone plays an essential role in the delivery of care. Hence, providing opportunities and time for nurses and assistant nurses, not only physicians, to meet, share and document best practice is crucial for the success of KM. Furthermore, rewording knowledge sharing with acknowledgment can help in making KM part of the organization's culture. Measuring the amount of sharing and the impact of the knowledge that is used is another important enabler of KM. Measuring does not only show that managers perceive knowledge sharing as critical it also ensures that only best practice is used in the organization.

The results of this study have made the leaders of the participating organizations aware of the lack of systematic KM processes. It has also made them aware of the fact that IT will not solve this problem. As a result, the 15 municipalities have decided to develop basic support for managers to start assessing their own organizations and start to systematize their KM processes. The support is based on the knowledge cycle (Fig. 1) and includes simple tools and ways of working in each step. The authors of this paper will study this development and also the implementation of the support.

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