

## **Investigating Methods of Transferring Tacit Knowledge among Nursing Experts of Iranian Hospitals**

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### **Abstract**

Nursing tacit knowledge is a knowledge that is produced inside the mind of nurses and not saved in any databases. The main challenge of nursing knowledge management is transferring tacit knowledge inside the mind of nurses to the others – especially scholars and researchers. This study evaluates personal, organizational, and technological factors affecting the tacit knowledge transfer among nursing experts. It also assesses the most important ways of tacit knowledge transfer among hospital nurses. This study applied survey method. The population was all nursing experts of Bushehr governmental hospitals nurses which were 480 and finally 215 nurses were selected as the sample. Data collection tool included a researcher-made questionnaire. Descriptive and analytical statistics tests were used. It was revealed that the most important way of tacit knowledge transfer among nursing experts was participating in continuing educational courses. Findings indicated that the most important personal factor affecting tacit knowledge transfer was job security; most important organizational factor was rewards system; and most important technological factor was independent physical environment and educational technologies.

**Keywords:** knowledge management, knowledge transfer, tacit knowledge, nursing knowledge.

### Introduction

Studies show that successes in organizations rely on the exploitation of knowledge systematically (Alavi, 2001; Earl, 2001). Furthermore, significant relationships were found between a tacit knowledge index (TKI) in an organization and its performance (Harlow, 2008).

Knowledge management is a process which helps institutions and organizations to exploit knowledge assets properly. Various compositions have been proposed for the process of knowledge management, but the most common of all these compositions are structured external knowledge acquisition, systematic production of knowledge through information processing, conversion of experimental staff's knowledge or human assets into common organizational assets or structured intellectual capital, knowledge retrieval and maintaining it as an organizational asset, and knowledge transition beside its evaluation and continuous improvement of knowledge resources in organizations (Gottschalk, 2007).

According to relevant studies, one of the stages of knowledge management process is knowledge transition in organizational contexts. Dixon (2000) stated that "choosing the appropriate knowledge transfer process in any organization depends on the kind of knowledge (tacit or explicit), common method and knowledge transfer process, and the kind of knowledge receiver (individual, group, or whole organization)."

In studies done in the field of tacit knowledge transfer, most researchers believe that tacit knowledge is totally private and formalizing it is very difficult, therefore transition of this knowledge to the others is not so easy and despite increasing awareness about the benefits of knowledge transfer, access to knowledge which is in the mind of people – and called tacit knowledge – or knowledge which is given to certain individuals documentary – and called explicit knowledge – faces some limitations. This fact is one of the reasons explaining why many organizations have taken this hidden knowledge as a valuable organizational capital. In fact, transfer of tacit knowledge among individuals with different aspects, attitudes, and motivations is a major step to achieving organizational knowledge transfer (Nonaka, 1994).

Although most researches have been done about tacit knowledge and work experiences in industrial companies, this issue has a significant importance in health field, and nursing particularly. In nursing, experiences, skills, occupational attitudes, and value-based and mental system are the most important keys for providing better services to patients. In most cases, nurses are faced with complex and unpredictable conditions as a result of having contacts with patients. This would lead to an increasing need for personal experiences among nurses.

Tacit knowledge of nursing which is created by subjective methods, is highly experimental, vague, related to action and usage, personal, difficult to formulate, and related to producer's aspect for transfer. In fact, tacit knowledge of nursing is a knowledge that is produced inside the mind of nurses and it is not saved in any databases. Also, the main

challenge of knowledge management in nursing is to transfer tacit knowledge produced inside the mind of nurses to the others and researches particularly. For example, there are some experienced nurses in hospitals who have precise nursing skills about types of diseases, experimental – commonly based on *trial and error*. This knowledge is not written in any document but it is so worthwhile. These nurses use this knowledge as a competitive advantage. Thus, this knowledge that, is hardly classified by other people, leads to heavy reliance on the nurses and is hardly transferred to other nurses. Another example of this kind of knowledge is enabling processes in different parts of hospitals. Creating optimized processes is possible only when a coherent group of nurses try to implement, monitor and improve the processes over a relatively long period. These processes include knowledge of all individuals in the form of team values, how to deal with patients, methods of organizing, and information systems. Knowledge gained from these processes can be considered as an advantage for organizations, and these organizations use this advantage as their own superiority over other hospitals and try to keep it much as possible. Also, this knowledge is an example of knowledge production that known as “Top Patterns” or “Best Practice” in knowledge management literature.

To recognize transfer of tacit knowledge, researchers have investigated various factors affecting this issue from different aspects. The most important factors affecting transfer of tacit knowledge which all studies have in common are personal barriers, organizational barriers, and technological barriers. Recognizing these factors plays an important role in successful knowledge management strategy of organization (Keshavarzi, 2008, Joia and Lemos, 2010, Koskinen, 2003).

Although investigation of process of transferring tacit knowledge among nurses are faced with some complexities according to above reasons, determining the best methods of transferring tacit knowledge and obstacles to their transfer could play an important role in increasing nurses’ knowledge and improving nursing services. Furthermore, generating a proper method for transferring knowledge inside hospitals and among them can provide appropriate context for growth of organizational knowledge and competitive advantages. Since, tacit knowledge transfer process has been less addressed in previous researches, this study aimed to investigate tacit knowledge transfer methods and its barriers in nursing departments of Iran’s hospitals and to present some solutions for improving this kind of knowledge transfer.

Using the factors described above, this study investigated transferring tacit knowledge process among hospitals’ nurses. The main purpose of this study is to investigate transferring tacit knowledge among nurses and its limitations. First, the most important methods of nursing knowledge acquiring were determined in nursing departments of Bushehr hospitals in Iran. Then personal, organizational, and technological barriers in transferring tacit knowledge have been investigated.

### Literature Review

Many studies have been published about tacit knowledge transfer in the health field. Yet, to the best knowledge of the authors, there has been no comprehensive investigation in the literature regarding this issue. But according to previous studies, it might be possible to identify main subjects in this field. Although, knowledge is a general concept and has almost the same definitions in different fields of industry and services, its characteristics and the relationship between these characteristics show some differences.

Reis Karimian and Rostami Nejad (2003) investigated the quality of knowledge management in hospital infection control in Yasuj (Iran). The results showed that infection control has been weakened. The researcher found that training classes and educational pamphlets available for putting nurses in their knowledge management has been effective.

Tsai and Tsai (2005) studied critical success factors in nursing knowledge transfer. The findings indicated that students who already had the knowledge, operated more independent than other groups. Also, among these students self-learning was preferred. This study showed that the existence of the previous tacit knowledge among groups of nursing students resulted in increased effectiveness of nursing knowledge transfer.

Studying the impact of internship, Wasonga and Murphy (2006) showed that not all tacit knowledge is useful. This study focused on the positives aspects. Certainly, some interns had experiences in which the tacit knowledge was not worth emulating. This study suggested that interns should expand their own awareness of learning opportunities posed by life experiences and gain insight into leadership.

Rajaeipoor and Rahimi (2007) investigated the relationship between knowledge management conversion process and performance of Isfahan (Iran) University faculty members. The results show that there were positive and significant correlations between knowledge management conversion process and performance of Isfahan University faculty members.

Shahvali and Lachini (2007) found that the most frequently used tacit knowledge resources in “Agricultural Organization of Fars (Iran) Province” included books, periodicals, reports, and organizational researches. Also, the most common methods used for communication to promote knowledge were talk with colleagues; participate in seminars; and face to face talks.

Jih, Chen and Chen (2008) studied four specificities of knowledge in hospitals. The main purpose of this research was investigating the effects of these variables on each other in Thailand hospitals. The framework of this study involved four structures and each structure included some variables. The most important hypothesis which helped this study was investigating the relationship between knowledge characteristics and knowledge transfer strategies. The results showed that there was a significant relationship between knowledge characteristics and knowledge transfer strategies. The main results indicated that hospitals, on

the basis of being tacit or explicit knowledge and also complexity of that, noted knowledge transfer strategies.

Rafati Shaldehi, Hosnavi, Behazin, and Banitaba (2008) in their study on knowledge management pattern in military research center found that general center situation, in terms of knowledge-based and utilization of knowledge assets, is less moderate - between moderate and poor.

In the study conducted on types of nursing knowledge, Mantzoukas and Jasper (2008) showed that five discrete types of nursing knowledge that nurses used in practice included personal practice knowledge, theoretical knowledge, procedural knowledge, ward cultural knowledge, and reflexive knowledge.

Mokhtarnia, Zvanfar, Shaaban Ali Fami, and Jafarnezhad (2008) examined the relationship between attitudes/skills of agricultural extension experts in using information technology and knowledge management. Findings indicated that there were positive and significant correlations between attitudes of agricultural extension experts about knowledge management and their skills in using information technology and six components of knowledge management – acquiring knowledge, sharing knowledge, evaluating knowledge, creation/storing and deleting knowledge, disseminating/applying knowledge, and file management.

In another study Shirvani, Safdarian, and Alavi (2010) tested some hypothesis like identification, acquisition, promotion, sharing and dissemination, applying and storing knowledge in the field of knowledge management. The results showed that in this university in each of these six processes, there were not proper contexts for establishing them.

### Methodology

This study applied the survey method to investigate the discussed issue. The population for this study included all nursing experts of Bushehr (Iran) governmental hospitals in 2011 which were 480. For sampling, the Morgan Sample Size Table was employed and finally 215 nurses were selected. Data collection tool was a researcher-made questionnaire that involved three parts: first, demographic information like age, gender, work experiences, and employment statuses; second, knowledge transfer methods; and third, effective factors to transfer tacit knowledge in these three categories: *personal factors*, *organizational factors*, and *technological factors*. Personal factors affecting the transfer of tacit knowledge include: need to allocate appropriate time and reduced volume of activities of nurses, job security, understanding the importance of tacit knowledge transfer, preferring explicit knowledge over tacit knowledge, and familiarity with technology. Organizational factors affecting the transfer of tacit knowledge include: attending to the tacit knowledge by managers, organizational resources available to support the transfer of tacit knowledge, creating the appropriate physical environment of nursing work, creating specific tasks of tacit knowledge transfer in

the nursing duties, bilateral flow of knowledge transfer in hospital through “up-down” and “bottom-up” processes, proper organizing of collecting nurses’ experiences, and reward and compensation systems within knowledge transfer services. Technological factors affecting the transfer of tacit knowledge include: access to mass media in the workplace, access to internet and intranet, familiarity with the use of virtual discussion groups, familiarity with use of weblogs, and creating educational technology facilities.

For the assessment of content validity of this questionnaire, the viewpoints of professors and experts have been used. In order to assess the reliability of questionnaire Cronbach’s alpha was calculated ( $\alpha=0.784$ ). In data collection process, researchers distributed 215 questionnaires in shift works hospital in specific time and finally 200 completed questionnaires were returned. For data analysis, descriptive and inferential statistics were applied by using SPSS16. It is necessary to say that in analysis phase, scores were given to data and then the mean was calculated and it was presented based on number 100.

### Research Questions

- 1) What are the most important ways of transferring tacit knowledge among Bushehr hospitals nurses?
- 2) What are the most important personal, organizational, and technological factors affecting the transfer of tacit knowledge among Bushehr hospitals nurses?
- 3) Is there any significant relationship between transferring tacit knowledge and the factors which affecting the transfer of tacit knowledge?
- 4) Is there any significant relationship between tacit knowledge transfer and demographic factors?

### Findings

The results of demographic characteristics indicated that the average age of studied population was 30.8; among this population there were 87% female and 13% male. The average age of male was 31.8 and female was 30.6. The mean work experiences of this population were 7.1 years (male 5.7 years and female 7.3 years); 66% of these experts were formal employee and the rest (34%) were informal employee. Research findings were divided into four parts.

#### *Q1) the most important ways of transferring tacit knowledge among nurses*

According to statistical investigation, the most important way of transferring tacit knowledge among male and female nurses was participating in continuing educational courses but the lowest important way was using weblogs. Table 1 shows mean, standard deviation, and scores compared to the separation of gender knowledge transfer ways.

Table1

*The average scores of ways to transfer tacit knowledge by separation of male and female*

Transmission Method	male		female		P
	mean	SD	mean	SD	
Verbal communications with other nurses	82.42	14.87	86.49	15.46	0.3
Participating in continuing educational courses	90.38	11.35	86.85	13.79	0.22
Participating in nursing conferences	69.23	18.1	74.21	16.63	0.26
Communicating through mass media	56.73	16.6	56.75	18.85	0.26
Communicating through discussion groups	57.21	16.64	58.69	15.75	0.79
Communicating through email	40.38	11.88	38.72	16.16	0.61
Communicating through weblog	16.33	5.88	23.49	11.34	0.001
Communicating with other nurses in informal environment	30.26	16.20	25.14	17.93	0.015

***Q2) the most important personal, organizational, and technological factors affecting the transfer of tacit knowledge among nurses***

As mentioned above, the most important factors which affecting the transfer of tacit knowledge among nurses are *personal factors*, *organizational factors*, and *technological factors*. Table 2 indicates the average scores of factors affecting the transfer of tacit knowledge based on male-female distinction.

Table2

*The average scores of factors affecting the transfer of tacit knowledge based on of male-female distinction*

Factors		Male	Female	Total	P
Personal	Mean	54.42	61.92	60.95	<0.001
	SD	9.83	9.62	9.95	-
Organizational	Mean	86.81	81.21	81.94	= 0.027
	SD	9.78	9.82	9.82	-
Technological	Mean	88.46	81.35	82.27	= 0.001
	SD	10.46	9.31	9.74	-

Mann-Whitney test showed that there is a significant difference between male and female nurses' average scores of personal, organizational, and technological factors. Average scores

of personal factors in female were more than male ( $P < 0.001$ ). But average scores of organizational factors in male were more than female ( $P = 0.027$ ). Also, average scores of technological factors in male were more than female ( $P = 0.001$ ). On the whole, from the viewpoint of nurses, technological factors, organizational factors, and personal factors showed the most effectiveness in transferring the tacit knowledge, respectively.

Findings by the present study showed that job security is the most effectiveness personal factors; also, physical environment independent of the working environment and educational technology facilities are the most effectiveness factors in transferring tacit knowledge among nurses.

### ***Q3) Relationship between transferring tacit knowledge and the factors affecting the transfer of tacit knowledge***

To investigate the relationship between transferring tacit knowledge and the factors affecting the transfer of tacit knowledge, the correlation tests were used and result showed no significant relationship between them.

### ***Q4) Relationship between transferring tacit knowledge and demographic factors***

Data analysis indicated significant and positive relationship between personal factors scores affecting the transfer of tacit knowledge and nurses' experiences ( $P < 0.001$ ) but there was no significant relationship between technological and organizational factors affecting the transfer of tacit knowledge, and nurses' experiences.

Also, Kruskal-Wallis test showed that there is no statistically significant relationship among personal, organizational and technological factors affecting the transfer of tacit knowledge, and kind of employment or job status ( $P > 0.05$ ).

In addition, there is significant and positive relationship between organizational factors affecting the transfer of tacit knowledge and age of nurses; but there is no significant relationship between personal and technological factors affecting the transfer of tacit knowledge and age ( $P > 0.05$ ).

## **Discussion**

According to findings, continuing education process was recognized as the most important way of transferring tacit knowledge. In 1995, after "Iran continuing open learning law of medical society" was approved, the condition of improving and evaluating nurses had been subject to submitting the certification of participating in these training courses (Department of Health and Medical Education, 1995). On the other hand, factors such as tendency for job promotion, changing the nurse's role and developing nursing tasks, patients' requests for receiving appropriate services, all and all, focus on educational needs of nurses (Bocouzi, 1989). Consequently, each nurse must be educated for her career and scientific

development. Nursing continuing education is the provided experiences in workplace which aims to help nurses for operating career functions (Hegge, 1985).

Also, the findings obtained by this research support this issue. Three below characteristics cause continuing education to be determined as one of the most effective way for transferring tacit knowledge:

1. Continuing in education
2. Focusing on experimental and job training
3. Relationship between this education and job security and promoting nurses' job position.

Also, findings of this research suggested that the most important personal factor of transferring tacit knowledge is job security. Some knowledge owners worry about that transferring knowledge lead to reducing job security. Some people follow this viewpoint that "knowledge and information bring power" and this justification force them to conceal their knowledge and information and in turn, think that this transferring knowledge leads to weakening their organizational position (Probst, Raub, and Rombahardt, 2000, Tiwana, 2002, Peel and Rowley, 2010).

One reason of this problem is that they have lack of confidence about sharing knowledge with their top-level individuals; some of low-level and mid-level individuals do not transfer knowledge intentionally (Lelic, 2001). This would make it possible that if their managers perceive that knowledge of other nurses is higher than theirs, their improvement will be stopped by the managers. For example, Michailova and Husted (2003) showed that Russian managers have reluctance to work with their subordinates and resist in learning from them.

These cases and results of this research indicate that protecting job security among nurses and their job growth in hospital environment is one of the most important factors affecting the transfer of tacit knowledge.

By investigation of organizational factors affecting the transfer of tacit knowledge, we realized that the most important issue in this area is creating an appropriate reward system from nurses' viewpoint. Of course, it should be mentioned that this system has a direct relationship with tendency to job security and job improvement.

Although there are discussions about the effectiveness of reward systems and evaluation of operations as a motivational factor of transferring knowledge, some authors debate that change in reward systems and its related policies has rarely affected organizational culture and transferring knowledge in long-term period (Ellis, 2001, McDermott, 2001).

In some findings, for knowledge with low level of intangibility (e.g. data), a target payment scheme has been optimal. For knowledge with medium level of intangibility (e.g. expressible tacit knowledge), the optimal incentive solution has been a function of management's ability to infer employees' effort from knowledge sharing results. For

knowledge with high level of intangibility (e.g. inexpressible tacit knowledge), there is no payment scheme that can be derived from the principal-agent model to encourage employees to share knowledge (Nan, 2008).

Reward programs similarly, targeted rewards are the most powerful means to increase worker tacit knowledge sharing. Behavior is shaped by rewards, and tacit knowledge sharing will respond accordingly. Beyond explicit motivation, rewards signal management's commitment to tacit knowledge sharing, and thus help shape an organization's cultural lens. These rewards should be well-communicated, relevant, attainable, and integrated to reflect a cohesive knowledge management strategy (Mayfield, 2010, Nan, 2008).

Also, in organizational culture that opposite to knowledge transfer, using the rewards and incentives is inadequate because these incentives lose their effectiveness, rapidly. So, it is necessary for managers and head nurses to convert organizational culture to transferring knowledge culture. In this case, it is not important that what kinds of reward systems are chosen, because however this task leads to giving importance to knowledge transfer. One way of appreciating nurses' knowledge transfer is to treat it as a criterion for evaluating their operations. Accordingly, "Iran continuing open learning law of medical society" uses this mechanism for developing medicine and nursing knowledge transfer. As mentioned above, nurses must participate in these educational courses for their annual improvement.

Some research findings suggested that subject of tacit knowledge transfer, content and process, are poorly understood. While managers and project leaders saw the value of tacit knowledge, there were different perceptions of the goals successful knowledge transfer and a lack of processes to manage its process. While project managers may feel that they have tacit knowledge transfer in hand, they have not managed to transfer the knowledge needed for long-term product management (Foos, Schum, and Rothenberg, 2006).

The lack of proper infrastructure for supporting knowledge transfer activities- especially in its informative dimension- has a negative effect on creating effective context for transferring knowledge. Creating a proper infrastructure and providing adequate resources for facilitating knowledge transfer activities within departments and among them in an organization is the basis for a successful knowledge management program (Schlegelmilch and Chini, 2003).

Also, in this research one factor that affecting tacit knowledge transfer is to create proper infrastructure in the field of educational technology. Educational technologies include hardware technology, software technology, and educational resources. In the field of hardware technologies such as networks, computers, and aid-teaching tools some advances are made in hospitals of Iran; but there are numerous deficiencies in the field of software technologies and educational resources. For instance, databases such as *BMJ Learning* and *Nursing Skills* are not available to nursing experts in hospitals of Iran and the same databases have not been prepared in Persian too. Attending to the importance of educational resources –

especially continuing education- can play a great role in development of tacit knowledge transfer among nurses.

In this research, there were significant relationships among the main factors – personal, organizational, and technological factors – and tacit knowledge transfer among male and female. The impact of personal factor in female was higher than male in the field of tacit knowledge transfer and the impact of organizational and technological factors in male was higher than female in the field of tacit knowledge transfer.

### **Conclusion**

Lack of clear relation between knowledge management strategies and overall goals of hospital might be the most important reason for failure of most transfer knowledge strategies in nursing of Iran's hospitals. In other words, knowledge transfer in these organizations is considered as an independent and separated activity from other activities. Organizations that want to have a successful knowledge management strategy should focus on potential factors of knowledge transfer.

It could be concluded from this research that the conformity among following elements is necessary for creating successful knowledge transfer strategy among nursing experts:

1- Processes and resources which create organizational culture of continuing education. In Iran's hospitals, the most important process could be nurses' continuing education. But we should remember that continuing these courses must cause promoting self-learning culture and collective learning among nurses.

2- Creating an environment with high job security and proper context for job improvement.

3- Motivating, encouraging, and stimulating staff in organization so that they transfer and apply useful existing knowledge and modern knowledge.

4- Applying advanced educational technology that produces knowledge resources knowledge mechanisms systematically through hardware and software infrastructures; and providing accessibility to various types of knowledge for all people which need it.

The following table (Table3) indicates the main goals of tacit knowledge transfer among nursing experts and strategies to achieve these goals that are offered by the results of this research. The combination of different strategies can produce successful strategy in nursing's tacit knowledge transfer in hospital environments of Iran.

Table3

Main goals of tacit knowledge transfer among nursing experts and strategies to achieve these goals by using the results of this research

<i>Main factors</i>	<i>Practical Solutions</i>
Continuing Education of Nursing Knowledge	To Develop continuing Education of Nursing through Self-educating approaches and personal experiments transfer
Job Security & Improvement	1. Developing Functional Management Systems by Adding Personal & Collective Knowledge Synergy 2. Job Enrichment
Motivating, Encouraging & Promoting	Developing reward Systems with Functional Management Systems
Educational Technology	1. Empowering Infrastructures of network & Communications in Hospital Environments 2. Developing Persian Nursing Education Databases in Hospitals

Creating an effective environment for sharing knowledge and organizational learning does not necessarily mean a great financial investment. This is because of the fact that formal and informal knowledge transfer networks have existed in advance. The first step is to identify knowledge transfer factors and is to recognize the gap between status quo and ideal condition for transferring knowledge, the results which indicated in this research might be different in various hospitals' environments. In hospitals which have educational and treatment roles together simultaneously, tendency to tacit knowledge transfer are higher than other environments. Also, the results may be different in communities which operate in cultural knowledge-based environments.

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