

## Total Knowledge Transfer Model to Diffuse Innovation of the Public Health Workforce

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### Abstract

**Purpose** – *the purpose of this article is to test a model designed to achieve Total Knowledge Transfer in the public health sector.*

**Design/methodology/approach** - *The research design was deductive in nature and used a case study for accomplishing the research objectives. Evaluation was conducted to test the hypotheses on which the ‘Total Knowledge Transfer Model’ has been developed.*

**Findings** - *The results corroborate the proposed conceptual model and are also in line with the existing literature demands. There is a positive significant relationship between achieving Total Knowledge Transfer, improving patient care and the four suggested organizational factors.*

**Research Limitations/implications** - *The results of this study are drawn from a fairly large sample in only two hospitals. A further research can be conducted to cover more responses from a wider health sector.*

**Practical Implications** – *The Total Knowledge Transfer Model is essential to improve the transfer and application of total common health knowledge.*

**Originality/Value** – *The Total Knowledge Transfer Model integrated four essential organizational factors which have been under examined in the literature.*

**Keywords** – *Knowledge Management, Knowledge Transfer, Health Care*

**Paper Type** – *Research Paper*

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## 1.0 Introduction

The world is moving into a knowledge economy where the performance of the organization is becoming more dependent on managing knowledge. Mayers says that ‘Corporate success in today’s economy comes from being able to acquire, codify and transfer knowledge more effectively and with greater speed than the competition’ (1996, P.1). In today’s changing world, people need to realise that what did well in the past is no longer providing effective results; they need to change and come up with new innovative ways. Hitt et. al. say that ‘invention brings something new into being, while innovation brings something new into use’ (2007, P.394)

Knowledge management is a relatively new concept. It originated in the business sector, is increasingly applied to the public sector and more recently has appeared in the health management field. Nicolini et al. say that ‘over the past ten years, Knowledge Management (KM), as a concept and a set of practices, has penetrated increasingly into the fabric of organizational and managerial processes in the healthcare sector’ (2008, P.245).

## 2.0 Knowledge Gap

The National Health Service (NHS) in the UK is made of over a million individuals in hundreds of organizations each of which have their own knowledge. Thousands of medical works are published worldwide every single year. Valuable knowledge and expertise were lost when a staff member moves on. Patient care needs a reliable up to date professional knowledge. Knowing what new and what works in headlines is not enough to ensure delivery of good performance. These are just few remarks that made this research vital in concentrating on one aspect of knowledge management; the knowledge transfer.

In health care, medical advancements are being made all the time and new knowledge need to be learned and transferred. Health workforce needs to let go of out-of-date (Know-how) and learn new (know-how). They need to learn from each other and put into practice what they have learnt. ‘Push technology to disseminate information has magnified the problem of unwanted information, and busy clinicians are now caught in an information paradox—overwhelmed with information but unable to find the knowledge they need when they need it’ (Gray, 1998, P.832).

In the NHS, the knowledge transfer initiatives are focusing too much on either technology or cognitive issues. The projects and strategies of the NHS emphasise on the use of technology in transferring explicit knowledge while ignoring the vast value of tacit knowledge that also exists. De Lusignan et al. say that ‘in recent years, health care services have increasingly placed an emphasis on formalized explicit knowledge or evidence-based medicine’ (2002, P. 302). The strategies in the NHS are also more inclined to information rather than knowledge.

Techno-centric way of thinking is not enough to transfer both types of knowledge. It is important to remember first, that it is knowledge we are seeking not only information. ‘Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates and is applied in the minds of knowers. In organizations, it often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms’ (Davenport, Prusak, 2000: P.5).

Despite the benefits of technology and its ability to facilitate the access to a growing body of knowledge for the health workforce, it is not enough to ensure that the information are put into practice and professionals are delivering a good practice. Add to that, part of the medicine science cannot be computerized.

Based on the above, this research will concentrate on one aspect of knowledge management; knowledge transfer in the public health sector.

### **3.0 Research aim**

The objective of this study was to design a new Total Knowledge Transfer model that differs from the existing ones in that, it meets the requirements and challenges in the public health sector and that it will achieve four organizational factors; transferring both types of knowledge at all levels and putting that transferred knowledge into practice, taking into account pillars of knowledge management.

### **4.0 Research Methodology**

The research design, guided by a quantitative philosophy, was deductive in nature and used a case study for accomplishing the research objectives. Based on existing body of knowledge regarding knowledge management and transfer, the researcher deduced four main points to achieve Total Knowledge Transfer, set the hypothesis and then conducted an evaluation to test the hypotheses on which the 'Total Knowledge Transfer Model' has been developed.

This research is mainly concentrating on health workers and excluded patients and members of the public. The researcher based this study on a sample which covered different health work force groups (managers, consultants, junior doctors, nurses, radiographers, health support worker e.g., Admin & clerical, secretary).

Since the population for this research is large, where it is impossible to survey all health workers, the researcher decide to choose six directorates from the hospital as been agreed with the Research and Development Department. They are: Pathology, Radiology, Acute Medicine, General surgery, Plastic Surgery and Obstetrics & Gynaecology. This is one of the limitations of this study. However, the chosen departments covered the busiest and largest departments in the hospital.

Due to the pressurized time of health workforce, Research and Development Department recommended limiting the number of questionnaires in order to collect realistic achievable number of completed questionnaires. The sample size was not based on a mathematical or statistical method. The researcher surveyed 210 participants (as was agreed upon with the ethical committee). This is considered as one of the limitation of this study.

The distribution of questionnaires within each directorate, was based on the (stratified random sampling) procedure. The target population (health workforce) was divided into a number of groups or strata (managers, consultants, junior doctors, nurses, radiographers, health support worker, e.g.; Admin & clerical, secretary).

A sample of each group was selected by the manager of each department to match approximately the percentages of each group within the population. Within each department 35 questionnaires were distributed. Attempt was made to match the distributed questionnaires (number 35) to the real percentage of the hospital staff. For example, 17 questionnaires (48%) were given to nurses, where it approximately matches the nurses' percentage (47%) in the Trust. The sum of all the samples of the different groups from the six directorates formed the final study sample.

The questionnaire was sectioned into ten headings. To facilitate the analysis of the questionnaires, I analyzed each of the headings separately. The frequencies and percentages of each statement were calculated.

### **5.0 Hypothesis Formulating**

Reviewing the literature, there is no model that aims at achieving a Total Knowledge Transfer. This study proposed and test the four main points needed to be integrated in order to achieve a total transfer and deduced that there is a need for a Total Knowledge Transfer Model; that can be called Total for its ability to achieve four main points needed for a total knowledge transfer:

1. Total in involving transmission, absorption and put transferred knowledge into practice.
2. Total in transferring both explicit and tacit knowledge.
3. Total in considering the flow of knowledge at all levels (from one place, person, group, organization to another).
4. Total in considering knowledge management pillars when managing the transfer (strategy, culture, people, technology and structure).

The models discussed in the literature review may have achieved one or two of the above four points, however, there is no existing model that achieves the above four points together.

(Fuchs et al., 2000) cited in (Ahmed et. al., 2002, P.124) say that ‘in an age when capabilities are generally accepted to be the backbone of sustainable competitive advantage, integration is one key capability that remains under used’. Before presenting the Analysis to validate the model, a discussion of the above four points and the grounding theories and relevant literature review that led to the deduction of the hypothesis will be presented.

### 5.1 Dependent Variable

The dependent Variable in this study is Total Knowledge Transfer. To look into Total knowledge Transfer the researcher drew out three main questions which are:

1. Are knowledge assets covering different types of knowledge both explicit and tacit?
2. Is transferred Knowledge put into practice and use?
3. Is the level of patient care is achieving a low rate (morbidity, mortality and patient in-hospital stay time)? In other words, better patient outcome.

Health workforce in their daily work needs different types of skills, expertise and knowledge that enable them do their job effectively. Medical advances and health knowledge are being made all the time so there is always new knowledge to be transferred and applied. Health workforce can easily be stuck into routines that become outdated as new knowledge becomes available. Therefore they should push themselves to consider alternatives everyday.

Transferring different types of knowledge assets can be identified through using different approaches and media. However transferring different types of knowledge is not enough to ensure better patient care. There is a need to benefit from the transferred knowledge and put that knowledge into practice and use through using different approaches and strategies. Brachos et. al. state that ‘making knowledge available is not equal to knowledge transfer. Knowledge also needs to be used by the receiving part. Knowledge transfer actually occurs when received knowledge is used by recipients and this use results in changing their behavior; in other words when experience of one individual or unit influences another unit through changes in behavior ([Nelson and Winter, 1982](#); [Argote and Ingram, 2000](#)). [Von Krogh \(2003, p. 374\)](#)’ (2007, P. 33).

Davenport and Prusak say that ‘although we traditionally think of assets as definable and “concrete”, knowledge assets are much harder to pin down’ (2000, P.5). People, processes and products/services are the most important knowledge carriers in an organization. It is difficult to measure knowledge assets directly therefore the third question is derived.

Results of Total Knowledge Transfer is difficult to measure in quantitative terms, however it can be measured by relating it to the achievement of business results. Based on the result of the questionnaire, (79.2 %) mentioned that (morbidity, mortality and patient in-hospital stay time) is the ultimate aim of the health professional when treating their patients. Therefore the third question above is derived. It reflects the reliability and effectiveness of total common health knowledge and the processes that is used to put transferred knowledge into practice. The continuous application and

use of transferred new health knowledge results in less morbidity, less mortality and patient will leave the hospital in less time.

Therefore it is hypothesized that:

H1: Continuous transfer of Total Common health knowledge has a positive relationship with achieving better patient care.

H2: Continuous application of transferred new health knowledge has a positive relationship with achieving better patient care.

## 5.2 Independent Variables

### A. Explicit and Tacit Knowledge Approaches:

Looking at knowledge management approaches, Sanchez found that there are two main approaches that organizations follows, 'The *tacit knowledge* approach emphasizes understanding the kinds of knowledge that individuals in an organization have, moving people to transfer knowledge within an organization, and managing key individuals as knowledge creators and carriers. By contrast, the *explicit knowledge* approach emphasizes processes for articulating knowledge held by individuals, the design of organizational approaches for creating new knowledge, and the development of systems (including information systems) to disseminate articulated knowledge within an organization' (2000, P.1).

Kalling and Styhre say that 'knowledge is seen as socially embedded, expressed in practices of communication and through storytelling, in brief as highly dependent on what is commonly referred to as human capital, i.e. human beings. On the other hand, knowledge is regarded as an organizational resource that is primarily to be captured and distributed through various technological systems such as computer databases and Intranets' (2003, P.61).

Based on the above two views, different models for knowledge transfer has emerged. Some of the models concentrated on the social perspective while others emphasize on technological application when transferring knowledge.

Stacey emphasizes the every -day conversation and says that managers' key role is to facilitate different ways of conversing. He says 'new themes emerge as people struggle to understand each other and as their conversations are cross-fertilized through conversations with people in other communities and disciplines. Organizations change when the themes that organize conversation and power relations change. Learning is change in these themes. Knowledge is language and meaning emerges as themes interact to form conversations' (2003, P.417)

Those who adopted the tacit approach believed that knowledge can be transferred through participation in social networks. 'It is important to say that technology does not connect us. Our relationships connect us, and then we eagerly use the technology. We share knowledge because we are in relationship, not because we have broader bandwidth' (Morey et al., 2000, P.7).

On the other hand, many authors when managing the transfer of knowledge, they concentrated on the explicit approach. Sanchez says 'explicit knowledge approach assumes that the useful knowledge of individuals in an organization can be articulated and made explicit' He continues that 'explicit knowledge assets can then be disseminated within an organization through documents, drawings, standard operating procedures, manuals of best practice, and the like' (2000, P.6). Since technology can facilitate that, many organizations such as SAB, Caterpillar, Ford Motor Company have adopted technology solutions as a mean to transfer and manage their organizational knowledge.

From the above, two approaches have been conducted in organizations. Newell et al. (2002) say those who believed in the tacit approach assumed that the critical success factor is trust, collaboration and social networking. While those who believed in the explicit approach assumed

that technology is the critical success factor. The researcher strongly believes in the importance of totality in looking at matters. Therefore, it is essential to adopt both tacit and explicit approaches to achieve the best of both worlds. De Lusignan et al. proposed a model for clinical practice that is based on balancing ‘both explicit as well as tacit knowledge using both the information-centered and learner-centered styles’ (2002, P.300). In this research both approaches are needed, since advantages can be obtained through both the tacit and explicit approach and as Sanchez say ‘the advantages of each approach can be used to help offset the disadvantages of the other’ (2000, P.17). ‘The benefits of both tacit and explicit knowledge can be gained if soft and hard mechanisms are allowed to interact’ (Jasimuddin, 2008, P. 63). ‘ Thus, the eventual goal for most organizations will be to devise and implement hybrid knowledge management practices in which explicit knowledge management practices complement and significantly extend their initial tacit knowledge practices’ (Sanchez, 2000, P.18).

The researcher concluded that technology alone or social networking alone can not achieve transferring all types of knowledge. Davenport and Prusak say that ‘technology alone won’t make a person with expertise share it with others. Technology alone won’t get an employee who is uninterested in seeking knowledge to hop onto a keyboard and start searching or browsing. The mere presence of technology won’t create a learning organization, a meritocracy, or a knowledge-creating company’ (2000, P.142).

Part of what a health workforce can do is largely dependent on how to practice the art of doing that task. Rules, guidelines, documents can be useful but can’t determine how to practice that task. They can be integrated with a practical practice to achieve improving the knowledge of doing that task. Example, for a surgeon to become an expert and to fully capture the art of surgery, there is a need for a long practice and detailed training. This learning by doing can be enhanced through capturing other different views and concepts, existing in articles books and journals.

In health care organizations there are different types of knowledge that need to be transferred, and applying one approach of knowledge transfer may not be sufficient. In this study, both the explicit and tacit parts of knowledge will be considered. All these types of knowledge need to be transferred so that a health work force can accomplish his/her task towards the patients. In this research it will be called “*Total common health knowledge*” to encompass *all types* of knowledge that need to be totalized, *commonly* and *regularly* used so that a *health work force* can do his/her job effectively.

Therefore it is hypothesized that:

Ha1: There is a positive relationship between using face-to-face based tools for transferring tacit knowledge and achieving total common health knowledge.

Ha2: There is a positive relationship between using technology based tools for transferring explicit codified knowledge and achieving total common health knowledge.

Ha3: There is a positive relationship between using different tools and processes for transferring both explicit and tacit knowledge and achieving better patient care.

## **B. Transferring knowledge at all levels:**

Davenport and Prusak say that ‘unlike material assets, which decreases as they are used, knowledge assets increase with use: ideas breed new ideas, and shared knowledge stays with the giver while it enriches the receiver’ (2000, P.17). They added that ‘the expertise of experts ceases to be real knowledge when it refuses to examine itself and evolve. It becomes opinion or dogma instead’ (2000, P.10). ‘A person’s learning may be enhanced through engagement with others which enables the extension of that person’s capability to a new, higher level’, Vygotsky’s (1978) cited in (Gannon-Leary and Fontainha, 2007, P.2)

Ladd and Ward say 'more than one individual can use knowledge at the same time, and shared knowledge stimulates the creation of new knowledge. More importantly, this process appears to reduce costs and significantly contribute to overall organizational success by preventing individuals from repeating the mistakes of other individuals (Baum & Ingram, 1998; Gruenfeld, Martorana, & Fan, 2000)' (2002, P.3). 'Businesses are disconcerted by reinventing solutions and repeating mistakes because they could not identify or transfer best practices and experiential knowledge across locations or projects' (Tiwana, 2002, P.26). 'Effective communication among communities of practice and safety team is a critical factor in ensuring the delivery of effective health services and avoiding error and adverse events' Lingard et al. 2006 cited in (White et al., 2008, P. 83).

Transferring knowledge among different communities of practice, among different groups in different health organizations and crossing different boundaries, is essential for this knowledge to evolve and be integrated to the benefit of all.

Therefore it is hypothesized that:

Hb1: There is a positive relationship between using Internet, Intranet, meetings, etc. to transfer knowledge from one (person, group, and health- organization) to another and achieving total common health knowledge.

Hb2: There is a positive relationship between using Extranet to connect health workforce working in different geographical locations and achieving the transfer of explicit codified knowledge among them.

Hb3: There is a positive relationship between using different approaches to transfer knowledge from (one place, person, group, organization to another) and achieving better patient care.

### **C. Processes to put knowledge into practice:**

'Research findings are often not applied in practice and, consequently potential improvements in the standard and quality of patient care are not being realized' (Crookes and Davies, 2004, P185). Elwyn et al say that 'in health care, a well recognized gap exists between what we know should be done based on accumulated evidence and what we actually do in practice' (2007, P.1). Beesley and Cooper say 'innovation corresponds to the application of new and creative ideas and the implementation of inventions' (2008, P.53). 'One of the most important objectives of KM is to create value from organization's knowledge resources so that the knowledge held by the company will be transformed to fields of application and action ([Ordaz et al., 2004](#)). Thus, KM activities should lead to changes in behavior, changes in practices and policies and the development of new ideas, processes, practices and policies ([Bender and Fish, 2000](#))' (Zaim et al., 2007, P.57). Putting knowledge into practice and change the way thing is being done requires a well organized process of change. This process will help employees build their knowledge of how to direct change, keep track of progress and be flexible where and when necessary. Grol and Grimshaw say that 'Substantial evidence suggests that to change behaviour is possible, but this change generally requires comprehensive approaches at different levels (doctor, team practice, hospital, wider environment), tailored to specific settings and target groups' (2003, P.1225).

Therefore it is hypothesized that:

Hc1: Using different approaches to abandon outmoded knowledge, practices and routines and encourage the use of new knowledge has a positive relationship with putting knowledge into practice.

Hc2: Regular monitoring and evaluation of procedures used to implement the change has a positive relationship with putting knowledge into practice.

Hc3: Using different approaches to ensure health workforce is practicing the job effectively, safely, competently and up-to-date has a positive relationship with achieving better patient care.

#### **D. Knowledge Management Pillars:**

Kermally S. says that ‘managing knowledge is not rocket science- it is about creating an environment to encourage knowledge creation and transfer’ (2002, P.1). This environment can be created through the management of culture, people, technology, strategy and structure.

##### **d.1 Culture:**

Rogers and Semple say ‘culture is one of the biggest determinants of knowledge management success. A new system is only valuable if people use it, and a documented process is only beneficial if it is followed’ (2008, P.1). ‘A KM program needs to be congruent with the organizational, national and professional culture’ (Walker S., 2006, P.9). Corporate culture can either encourage or discourage knowledge sharing ‘Norms encouraging technology use would be expected to have a positive effect on technology use for knowledge management (Venkatesh & Morris, 2000; Green, 1998; Taylor & Todd, 1995)’ (Hurley & Green, 2005, P.7)

Organizational culture affects the way people work and managing it helps in the accomplishment of organizational goals. Therefore it is hypothesized that:

Hda1: Having a culture that promotes a continuous transfer of health knowledge has a positive relationship in improving total common health knowledge.

Hda2: Having a culture that promotes a continuous development and change has a positive relationship in improving organizational practices.

Hda3: Having a culture where health workforce is continuously transferring knowledge and is willing to develop their own knowledge and change their behavior has a positive relationship with achieving better patient care.

##### **d.2 People:**

Friesen (2001) and Crager (2002) considered that people are the greatest organizational asset. Crager say ‘while most companies would agree with this in principle, they often do not support it in their day-to-day actions’ (2002, P.5). Organizational success is based on people management ‘Any organization will go only as far as the people who are driving it. In fact, a company is really just a group of people who interact to achieve a common purpose. They are the ones who make up the organization’ (Harting, 2008, P.1). Managers are responsible for the motivation, training and ongoing support and direction for the employees of an organization.

‘Knowledge management in a business organisation means managing the activities of knowledge workers, which is achieved through facilitating, motivating, leading, and supporting knowledge workers and providing or nurturing a suitable working environment’ (Gao et. al., 2008, P.8).

Roberston, J. say that ‘knowledge management initiatives must be developed with an understanding of front line issues, to ensure that suitable techniques and approaches are used’ (2003, P.4).

Smith says that ‘the true reasons for sub-optimal KM performance are in very many cases related to the lack of supportive attitudes and emotions on the part of the organization’s employees’ (2004, P.1).

Hiatt and Creasey cited in (Platt N., 2004, P.1) define change management as ‘the process, tools and techniques to manage the people-side of business change to achieve the required business outcome, and to realize that business change effectively within the social infrastructure of the workplace. It is the people-side of change that we often ignore as we look to innovate’.

Health professionals are involved in the process of delivery of health care service. If they are managed well they will perform well.

Therefore it is hypothesized that:

Hdb1: Providing health workforce with both internal and external training has a positive relationship with increasing total common health knowledge.



Hdb2: Improving health workforce communication skills has a positive relationship with increasing total common health knowledge.

Hdb3: Having a personal development process has a positive relationship with improving health knowledge practice.

Hdb4: Rewarding people for their creative work has a positive relationship with improving their skills and practices.

Hdb5: Managing health workforce and improving their skills and keep them up-to-date has a positive relationship with achieving better patient care.

### **d.3 Technology:**

A great deal of research in the literature has documented how information technology can improve the way work is accomplished. 'Information technology – which includes hardware and software – is a major role-player in making information and knowledge accessible. It enables fast communication and fosters innovation through e-mail, intranets, groupware, portals and databases' (Schutte and Snyman, 2007, P. 17). [Edmondson](#) et al. say that 'The availability of codified knowledge increases the ability of managers or researchers to predict and plan subsequent performance improvement' (2003, P.12). 'The use of modern ICT offers tremendous opportunities to support health care professionals and to increase the efficiency, effectiveness and appropriateness of care' Ammenwerth et al. (2004) and Kohn et al. (2000) cited in (Ammenwerth et al., 2006, P. 1). 'A growing body of literature describes the successful use of multi-point videoconferencing to facilitate communication between health care professionals, including oncologists and surgeons; support the care of patients; and offer continuing education across great distances' (Gagliardi et al, 2003, P. 2).

'Technology can assist teams, who in today's world may meet only occasionally or even never, to share experiences on line in order to be able to build and share tacit knowledge, and more generally to work effectively together, even if the efficiency is less than in face-to-face meetings' (Marwick, 2001, P.14).

Technology is essential in health organization. It is a vehicle that facilitates knowledge transfer and collaboration among different health organizations. Without technology, knowledge transfer would be much more difficult and in some cases, may not happen at all. However despite its benefits, technology adoption may fail as a result of inadequate planning and poor management. Carvalho and Ferreira state that 'the wise selection of a KM software requires a previous analysis of an organization's knowledge needs. Among the considerations to be dressed, in some organizations, for instance, a low level of socialization may be the critical point; in other ones, externalization may need to be improved' (2001, P.23). Gamble and Blackwell discussed the importance of content management for the success of technology systems. They say that 'done well, nobody knows it is happening. Done badly, nothing works and people turn away from the knowledge systems because they are too muddled, out of date, irrelevant or simply inaccurate' (2001, P.176). Britten cited in (Oz and Jones, 2008, P.433) says that some reasons for the failure of the current NHS IT project in the United Kingdom is because 'Hospitals and GPs do not have integrated systems that can talk to each other' she added that 'those in charge of the project failed to consult widely enough and fully engaged users in the design and implementation of the new systems' (2008, P.434). The acquisition and utilization of technology needs proper management. Decisions must be made carefully to ensure that technology supply match health system and health workforce needs.

Therefore it is hypothesized that:

Hdc1: Continuous updating for existing networks and providing up-to-date clinical knowledge has a positive relationship with the transfer of explicit common health knowledge.

Hdc2: Providing technology system that is connected and integrated with each other has a positive relationship with the transfer of explicit common health knowledge.

Hdc3: Managing technology and choosing IT system that is integrated, easy to use, flexible and reliable has a positive relationship with achieving better patient care.

#### **d.4 Strategy:**

Heathfield says that ‘Strategic planning implementation is at the heart of how to make change of any kind happen in your organization’ (2009, P.1). For knowledge transfer to happen there is a need to develop a good knowledge transfer strategy that is closely aligned with the organisation’s overall strategy and objectives. Kouzes and Posner say ‘every organization, every social movement, begins with a dream. The dream or vision is the force that invents the future’ (2007, P.17).

Therefore it is hypothesized that:

Hdd1: Formulating strategies to transfer knowledge has a positive relationship with improving the transfer of common health knowledge.

Hdd2: Formulating strategies to implement change in practice has a positive relationship in improving the application of transferred common health knowledge.

Hdd3: Formulating a knowledge transfer strategy to guide the overall approach has a positive relationship with achieving better patient care.

Hdd4: Having a knowledge transfer vision that is communicated through the whole organization has a positive relationship with achieving better patient care.

#### **d.5 Structure:**

The structure of an organization is formed by ‘both physical and intangible constructs, such as the office building, organizational structures, reporting lines and management layers’ (Schutte and Snyman, 2007, P. 16). ‘The physical layout of offices can act as a barrier, since they can hinder and disturb communication among employees ([Hall and Sapsed, 2005](#); [Lehner and Lehmann, 2004](#); [von Krogh and Köhne, 1998](#))’ (Alwis and Hartmann, 2008, P. 140). The organizational structure of many firms does not support quality service operations and resulted in negative impact on the perceived service where ‘contact employee or department that have to interact with each other in order to produce a service may be geographically or physically far apart in the organization’ (Grönroos, 2007, P464). Mullins and Osborne say that ‘Too many NHS organisations are dominated by siloed, top down cultures and professional rivalries. We require a new level of trust to be developed between leaders and frontline staff, between managers and clinicians and between different professional groups’ (2009, P.1).

‘Through interaction with partners who hold diverse types of knowledge, firms can capture good ideas from a wide variety of sources, and can keep these ideas alive by discussing and using them, ultimately turning the promising ones into real services, products, processes, or business models’ (Mu et. al., 2008, P.95). To improve health professional’s interaction and transfer of best practices there is a need to overcome any structural barriers.

Therefore it is hypothesized that:

Hde1: Having a less hierarchical and flexible structure has a positive relationship with the transfer of total common health knowledge.

Hde2: Having a structure where health workforce can easily exchange their ideas and share their expertise and skills has a positive relationship with achieving better patient care.

**5.3 Statistical expression of the Hypotheses**

To express the hypotheses in the previous sections statistically, then the Null hypothesis ( $H_0$ ) is expressed as:

$H_0$ : Health professional do not agree with the statement.

And the alternative hypothesis (H) is expressed as:

H: Health professional Agree significantly with the statement.

**5.4 Dependent and Independent Variables Relationship**

Figure 1 shows a detail visual model with the predicted relationship between dependent and independent variables.

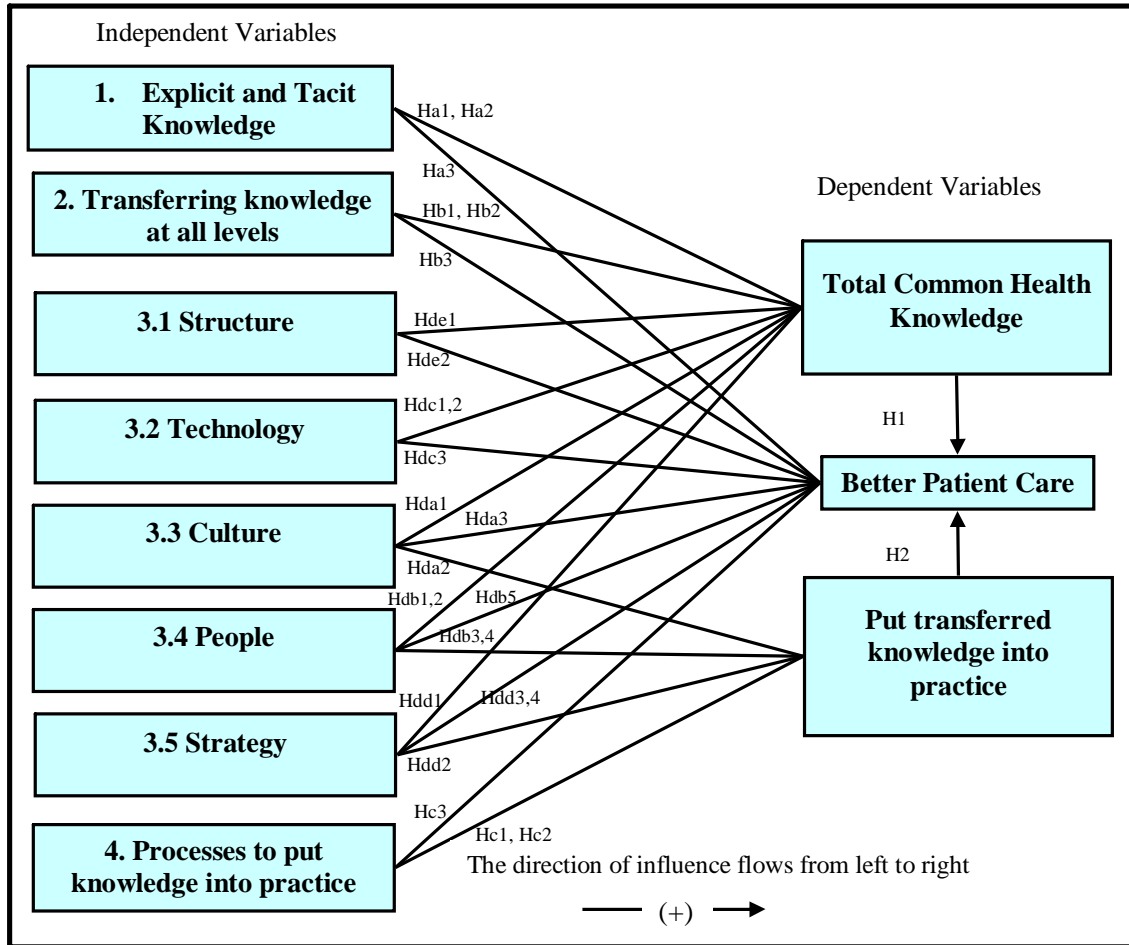


Figure 1 Total Knowledge Transfer Visual Model with the direction of relationship

**6.0 Data Analysis**

To test the hypotheses on which the ‘Total Knowledge Transfer Model’ has been developed, the researcher used a survey for data collection. The researcher distributed 210 questionnaires. However 94 questionnaires were completed out of 210 which were included in the data analysis.

The analysis of the data was conducted via statistical package for the social sciences (SPSS) version 13. The questionnaire was sectioned into six headings. To facilitate the analysis of the questionnaires, I analyzed each of the headings separately.

The respondents were 69.1 % females and 30.9 % males. The number of females is higher since most of the staff are nurses and radiographers, who are mainly females. The respondents’ roles

varied, the highest percentage was the nurses (39.4%), which is good since almost half of the hospital trust staff is made up of nurses. This was followed by consultants 23.4% then junior doctors 13.8%.

### 6.1 Statistics used

In this study the researcher wanted to determine whether there is a statistical association or relation between the dependent and independent variables. To test the hypotheses, Bivariate data analysis was used. Bivariate analysis is a 'tests of differences and measuring the association between variables' (Zikmund, 2003, P.505). Hair et. al. say that 'Correlation and regression are associative techniques that help us to determine if there is a consistent and systematic relationship between two or more variables' (2003, P.280) they added that 'four basic concepts we need to understand about relationships between variables: presence, nature of relationships, direction, and strength of association' (2003, P.280).

Bryman and Cramer say that 'when variables are interval, by far the most common measure of correlation is Pearson's Product Moment Correlation Coefficient, often referred to as Pearson's  $r$ ' (2009, P.212). According to Hair et. al. (2003, P.282), correlation coefficient ranges between  $\pm.41$  -  $\pm.70$  is considered to be of having a moderate strength of association, correlation coefficient range between  $\pm.71$  -  $\pm.90$  is considered to be of having a high strength of association, and correlation coefficient range between  $\pm.91$  -  $\pm 1.00$  is considered to be of having a very strong strength of association.

Based on that the following statistical instruments were performed on collected data:

- Descriptive statistics.
- Arithmetic mean and SD.
- Pearson's Product Moment Correlation Coefficient.

### 6.2 Reliability, Validity and sensitivity of scales

Zikmund say 'There are three major criteria for evaluating measurements: reliability, validity and sensitivity' (2003, P.300).

#### a. reliability:

Zikmund defined reliability as 'the degree to which measures are free from error and therefore yield consistent results' (2003, P.300). To assess the reliability of scales the researcher followed the internal consistency reliability test where Cronbach's alpha ( $\alpha$ ) for each statement that represent the main factors of the study was computed using SPSS. A Cronbach's alpha of 0.8 or higher is considered very good association. By applying reliability test, Cronbach's alpha = 0.98. . Based on the results, the alpha coefficients for all the dimensions indicate that the instruments used in the study have fair amount of internal consistency.

#### b. Validity:

The validity of a scale is the 'ability of a measure to measure what it is supposed to measure' (Zikmund, 2003, P. 302). The researcher followed the content validity approach. The researcher used different methods to find research on the topic, including library research, internet search engines, Journals. Then the questionnaire was designed based on the literature to cover all the items related to the concept. An examination of the wording of the statements and their coverage to the concept then was done by three health professionals (manager, consultant and a nurse) and the supervisors of the study. Through the above steps and judgment review, the content validity of the final survey was ensured to some extent.

#### c. Sensitivity:

Sensitivity refers to ‘an instruments ability to accurately measure variability in stimuli or responses’ (Zikmund, 2003, P. 304). The researcher used a seven-point Likert scale from Strongly disagree (1) to Strongly agree (7) since ‘the more points you use, the more precision you get on the extent of the agreement or disagreement with a statement’ (Hair J. et al, 2003, P.159). Also the researcher in some cases used more than one statement for the same idea as Zikmund says the ‘sensitivity of a scale based on a single question or a single item can also be increased by adding additional questions or items’ (2003, P.305).

### 6.3 Hypothetical Testing

Figure 2 displays the correlation coefficient  $r$  between the variables

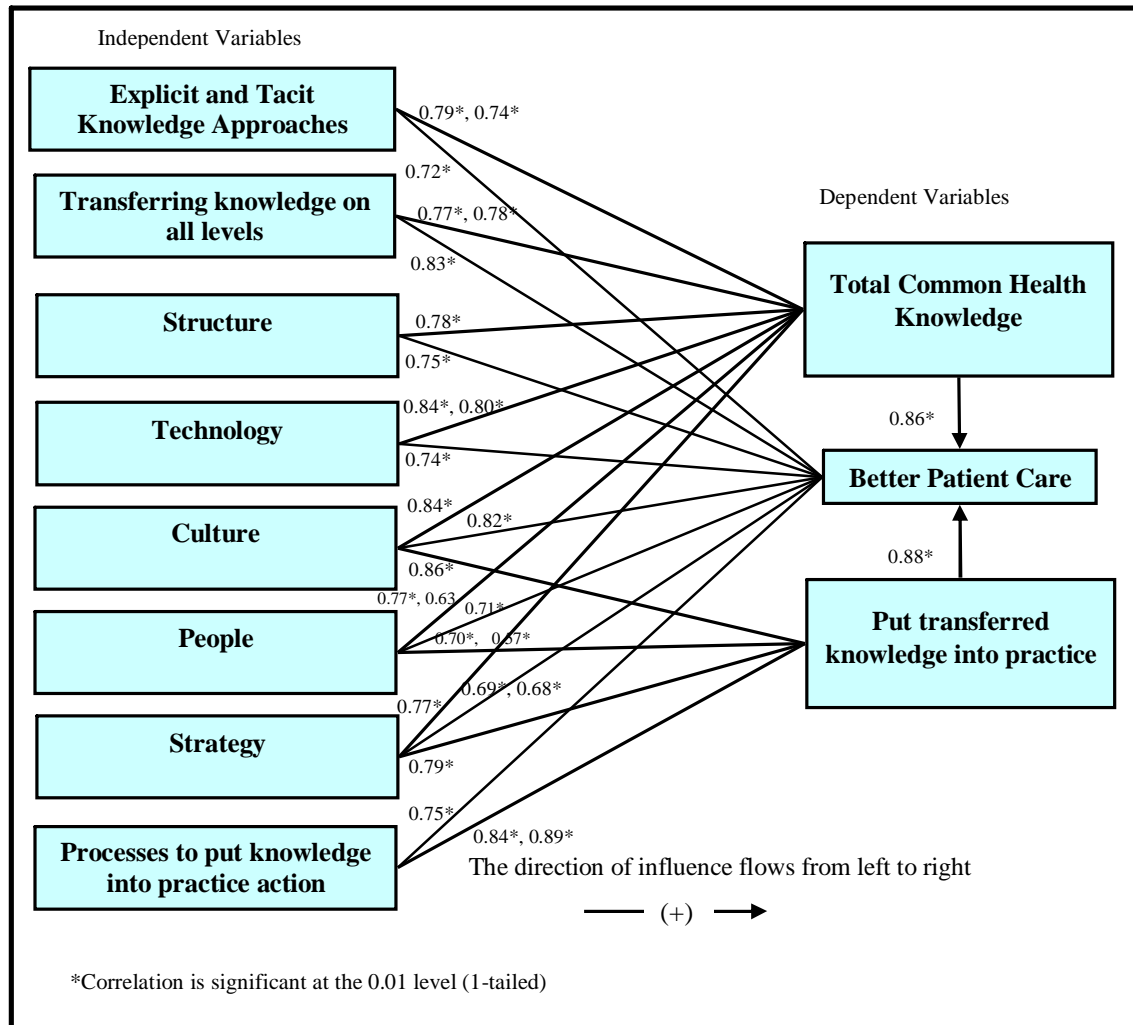


Figure 2 Results of Hypothesis Testing between variables

### 6.4 Discussion

From the results, the hypotheses received a high support to prevent their rejection. Testing H1 and H2 revealed that transferring both explicit and tacit knowledge and put them into practice has a high positive significant influence on achieving better patient care. The researcher concluded that Knowledge transfer and uptake is at the heart of an organization’s ability to deliver better patient care. Knowledge transfer and uptake need to be embedded within the NHS organizations to help them improve their practice.

Testing of all other hypotheses revealed that there are four main factors that positively and significantly influence the total transfer and application of total common health knowledge.

#### **6.4.1. Explicit and Tacit Knowledge Approaches**

Testing Ha1, Ha2 and Ha3 revealed that increasing the use of different tools and approaches to transfer explicit and tacit knowledge will result in increasing total common health knowledge which will also has a positive significant influence on patient care. The researcher concluded that there is a need to use a flexible, comprehensive range of tools, media, processes and systems to support, facilitate and monitor the effectiveness of transferring different types of health knowledge.

#### **6.4.2. Transferring knowledge at all levels**

Results of testing Hb1 Hb2 and Hb3 indicates that transferring explicit and tacit knowledge at all levels (from one place, person, group, organization to another) has a positive significant relationship with achieving total common health knowledge. The findings also suggest that improving the transfer of total common health knowledge on all level has a positive significant effect on achieving better patient care. The researcher concluded that transferring knowledge at all levels is needed to improve health knowledge and practice. It is important for any health organization to understand what other parts of the global health organizations are doing.

#### **6.4.3. Processes to put knowledge into practice**

Results of Hc1, Hc2 and Hc3 revealed that using different approaches to abandon outmoded knowledge, practices and routines and the regular monitoring and evaluation of these different approaches has a positive significant influence on putting knowledge into practice. The results also indicate that increasing the use of different approaches to ensure health workforce is practicing the job effectively, safely, competently and up-to-date will improve patient care. The researcher concluded that it is not enough for health professional to transfer health knowledge they must be able to harness and apply that transferred health knowledge to bring better patient care. For that to happen, the hospital must use a flexible range of different tools and approaches to constantly update and renew health knowledge. In addition, it needs to regularly monitor and evaluate these tools to ensure their effectiveness.

#### **6.4.4. Knowledge Management pillars**

##### **4.a Culture**

Testing Hda1, Hda2 and Hda3 revealed that organizational culture has a high positive significant influence in improving the transfer and application of total common health knowledge. Having a culture where health workforce is continuously transferring knowledge and is willing to develop their own knowledge has a high positive significant influence on achieving better patient care. The researcher concluded that organizational culture that encourages seeking out knowledge and applying best practices will result in improving organizational health knowledge and practice.

##### **4.b People**

Testing Hdb1, Hdb2, Hdb3, Hdb4 and Hdb5 indicates that managing health workforce has a positive significant influence in improving total common health knowledge and patient care. Surprisingly, three out of five (Hdb1, Hdb3 and Hdb4) have a medium correlation coefficient  $r$ . Hdb1 revealed that providing health workforce with both internal and external training has a medium positive relationship with increasing total common health knowledge ( $r = 0.63, P < 0.01$ ). Result of Hdb3 indicates that having a personal development process has a medium positive

relationship with improving health knowledge practice ( $r = 0.70, P < 0.01$ ). Testing of Hdb4 revealed that rewarding people for their creative work has a medium positive relationship with improving their skills and practices ( $r = 0.57, P < 0.01$ ). On the other hand, results of Hdb2 revealed that health workforce believed that improving health workforce communication skills has a high positive influence in increasing total common health knowledge ( $r = 0.77, P < 0.01$ ). And results of Hdb5 revealed that managing health workforce and improving their skills and keep them up-to-date has a high positive significant relationship with achieving better patient care ( $r = 0.71, P < 0.01$ ). These results may be due to the fact that communication skills-comparable with other skills- has the main impact on knowledge transfer effectiveness. In the first level, the researcher concluded that health workforce personally will see himself or herself good in communicating however others sees him/her in different way. From the above, the researcher concluded that health workforce believed in the management of people to improve knowledge transfer and uptake. Internal and external training, having a personal development process and rewarding people for their creative work will improve knowledge transfer and uptake. However, since knowledge transfer and social networking is highly dependent on communication skills, there is a need to pay more attention on identifying who needs to upgrade their communication skills and who needs to learn new ones, and providing more courses and training to achieve that.

#### **4.c Technology**

Results of Hdc1, Hdc2 and Hdc3 indicate that technology management has a high positive significant influence on the transfer of explicit knowledge. The results also revealed that managing technology and choosing IT system that is integrated, easy to use, flexible and reliable has a high positive significant relationship with achieving better patient care. The researcher concluded that as Information Technology creates increasingly 'virtual' ways of communicating and accessing clinical health knowledge to support evidence-based medical practice, its success is mainly dependent upon its management. IT system that is integrated, easy to use, flexible and reliable has a high positive relationship with transferring explicit health knowledge and achieving better patient care.

#### **4.d Strategy**

Testing Hdd1, Hdd2, Hdd3 and Hdd4 indicates that formulating strategies to transfer knowledge and implement change in practice has a high positive relationship in improving the application of transferred common health knowledge. Somewhat surprisingly, the result of Hdd3 formulating a knowledge transfer strategy to guide the overall approach has a medium positive relationship with achieving better patient care ( $r = 0.69, P < 0.01$ ). And the results of Hdd4 having a knowledge transfer vision that is communicated through the whole organization has a medium positive relationship with achieving better patient care ( $r = 0.68, P < 0.01$ ). These results may be due to the fact that 40.5 % of the respondents believed that the (lack of knowledge transfer strategies) is a minor obstacle, however the results may be different if health professional have the awareness of the importance of having a knowledge transfer strategy. The researcher concluded that there is a need to increase the awareness of having a well defined knowledge transfer strategy and vision that if communicated loudly, clearly and consistently will improve knowledge transfer. A good, clear knowledge transfer strategy gives the organization and health workforce a clear, communicable plan about how to manage transferring their knowledge better, where they are now, where they want to go, and how to plan to get there.

#### **4.e Structure**

Results of Hde1 and Hde2 revealed that organizational structure has a high positive significant influence in improving the transfer of total common health knowledge. Having a structure where health workforce can easily exchange their ideas and share their expertise and skills has a high positive relationship with achieving better patient care. The researcher concluded that overcoming limitation of traditional structures (Hierarchy, silos) and providing a structure where health workforce can easily exchange their ideas and share their expertise and skills will improve knowledge transfer and patient care.

#### **7.0 Conclusion**

It is clear, upon analysis of the data; the results corroborate the proposed conceptual model and are also in line with the existing literature demands. The results indicate that there is a positive significant relationship between achieving Total knowledge transfer and improving patient care and the four drawn organizational factors which are:

1. Transferring both explicit and tacit knowledge.
2. Considering all knowledge management pillars when managing the transfer (strategy, culture, people, technology and structure).
3. Involving transmission, absorption and put transferred knowledge into practice.
4. Considering the flow of knowledge at all levels (from one place, person, group, organization to another).

The researcher concluded that Total Knowledge Transfer Model is an integrated model connecting all the above factors.

#### **8.0 Future Directions**

The results of this study are drawn from a fairly large sample in only two hospitals of Mid Essex Hospital Services NHS Trust. A further deep research can be conducted to cover larger sample in the two hospitals and other health organizations. If more time and funding are available, it may be a good idea to conduct a further research to cover more responses from a wider health sector and to use more data gathering instruments such as; focus groups and observation

In this study the researcher explored the transfer of knowledge at all levels in the health care system (from one place, person, group, organization to another). Based on that, there is a need for a larger study to explore how to achieve that in this wide fragmented sector to allow Total Knowledge Transfer to succeed.

#### **References**

1. Ahmed, P., Kok, L., Loh, A., 2002. Learning Through Knowledge Management. Butterworth-Heinemann.
2. Alwis, R., Hartmann, E. 2008. The use of tacit knowledge within innovative companies: knowledge management in innovative enterprises. *Journal of Knowledge Management*. Volume 12. Number 1. PP. 133-147. Emerald Group Publishing Limited.
3. Ammenwerth, E., Iller, C., Mahler, C. 2006. IT-adoption and the interaction of task, technology and individuals: a fit framework and a case study. *BioMed Central Ltd.* [Online]. Available From: <http://www.biomedcentral.com/1472-6947/6/3>.
4. Beesley, L., Cooper, C., 2008. Defining knowledge management (KM) activities: towards consensus. *Journal of Knowledge Management*. Volume 12. Number 3. PP. 48-62. Emerald Group Publishing Limited.



5. Brachos, D., Kostopoulos, K., Söderquist, K., Prastacos, G. 2007. Knowledge effectiveness, social context and innovation. *Journal of Knowledge Management*. Volume 11. Number 5. PP. 31-44. Emerald Group Publishing Limited.
6. Bryman, A., Cramer, D. 2009. *Quantitative Data Analysis with SPSS 14, 15 and 16: A Guide for Social Scientists*. Psychology Press.
7. Carvalho, R., Ferreira, M. 2001. Using information technology to support knowledge conversion processes. *Information Research*. Volume 7. Number 1. [Online]. Available From: <http://InformationR.net/ir/7-1/paper118.html>.
8. Crager, B., 2002. Are People Really our Most Important Asset?. *Energy Houston*. volume 4. No.2.
9. Crookes, P., Davies, S., 2004. *Research Into Practice. Essential Skills for Reading and Applying Research in Nursing and Health Care*. 2<sup>nd</sup> ed. Elsevier Limited.
10. Davenport, T., and Prusak, L., 2000. *Working Knowledge. How Organizations Manage What They Know*. Boston: Harvard Business School Press.
11. De Lusignan, S., Pritchard, K., Chan, T., 2002. A Knowledge –management Model for Clinical Practice. *Journal of Postgraduate Medicine*. Volume 48. Issue 4. PP. 297-303.
12. Edmondson, C., Winslow, B., Bohmer, J., Pisano, P., 2003. Learning How and Learning What: Effects of Tacit and Codified Knowledge on Performance Improvement Following Technology Adoption. *Decision Sciences*.
13. Elwyn, G., Taubert, M., Kowalczyk, J., 2007. Sticky knowledge: A possible model for investigating implementation in healthcare contexts. *Implementation Science*. [Online]. Available From: <http://www.implementationscience.com/content/2/1/44>.
14. Gagliardi, A., Smith, A., Goel, V., Depetrillo, D., 2003. Feasibility study of multidisciplinary oncology rounds by videoconference for surgeons in remote locales. *BioMed Central Ltd*. [Online]. Available From: <http://www.biomedcentral.com/1472-6947/3/7>.
15. Gamble, P., and Blackwell, J., 2001. *Knowledge Management. A state of the Art Guide*. Kogan Page Limited.
16. Gannon-Leary, P., Fontainha, E., 2007. Communities of Practice and virtual learning communities: benefits, barriers and success factors. *e-Learning Papers*, no. 5. [Online]. Available From: <http://www.elearningeuropa.info/files/media/media13563.pdf>.
17. Gao, F., Li, M., Clarke, S. 2008. Knowledge, management, and knowledge management in business operations. *Journal of Knowledge Management*. Volume 12. Number 2. PP. 3-17. Emerald Group Publishing Limited.
18. Gray, J., 1998. Where's the chief knowledge officer? To manage the most precious resource of all. *British Medical Journal*. September 26; 317(7162): 832–840. [Online]. Available From: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1113941/>.
19. Grol ,R. and Grimshaw, J., 2003, From best evidence to best practice: effective implementation of change in patients' care.(Research into practice I). *Journal: The Lancet*. (Oct 11, 2003): p1225.
20. Grönroos, C., 2007. *Service Management and Marketing: Customer Management in Service Competition*. John Wiley and Sons, Ltd. 3<sup>rd</sup> edition.
21. Hair, J., Babin, B., Money, A. and Samouel, P. 2003. *Essentials of Business Research Methods*. Leyh Publishing, LLC.
22. Harting, D., 2008. Employees - Your Most Valuable Asset. *EzineArticles.com*. [Online]. Available From: <http://ezinearticles.com/?Employees---Your-Most-Valuable-Asset&id=975567>.
23. Heathfield, S., 2009. Make Strategic Planning Implementation Work. Develop a Strategic Culture for Successful Strategic Planning Implementation. *About.com*. [Online]. Available From: [http://humanresources.about.com/od/strategicplanning1/a/implement\\_plan.htm](http://humanresources.about.com/od/strategicplanning1/a/implement_plan.htm).
24. Hitt, M., Hoskisson, R., Ireland, R. 2007. *Management of strategy. Concepts and Cases*. Thomson South-western.
25. Hurley, T., Green, C. 2005. Creating a Knowledge Management Culture: The Role of Task, Structure, Technology and People in Encouraging Knowledge Creation and Transfer. *Proceedings collaborative improvisation: the play full intersection of jazz and work (composing a masterpiece knowledge creation and transfer at work)*, Midwest Academy of Management, Chicago.

26. Jasimuddin, S., 2008. A holistic view of knowledge management strategy. *Journal of Knowledge Management*. Volume 12. Issue 2. P. 57-66. Emerald Group Publishing Limited.
27. Kalling, T., Styhre, A., 2003. *Knowledge Sharing in Organizations*. Liber. Abstrakt. Copenhagen Business School Press.
28. Kermally S., 2002. *Effective Knowledge Management. A best practice blueprint*. John Wiley & Sons. Ltd.
29. Kouzes, J. and Posner, B., 2007. *The Leadership Challenge*. John Wiley & Sons, Inc. 4<sup>th</sup> edition.
30. Ladd, D., Ward, M., 2002. An Investigation of Environmental Factors Influencing Knowledge Transfer. *Journal of Knowledge Management Practice*.
31. Marwick, A. 2001. Knowledge Management Technology. *IBM Systems Journal*. Volume 40. No. 4.
32. Morey, D., Maybury, M., Thuraisingham, B., 2000. *Knowledge Management. Classic and Contemporary Works*. London: MIT Press.
33. Mullins, A., Osborne, P., 2009. Forget professional rivalries, focus on the passion of frontline NHS staff. Clinicians and frontline staff must be at the forefront of the drive for enhancing quality and productivity in the NHS. Public. [Online]. Available From: <http://www.guardianpublic.co.uk/nhs-frontline-staff>.
34. Mu, J. Peng, G., Love, E. 2008. Interfirm networks, social capital, and knowledge flow. *Journal of Knowledge Management*. Volume 12. Number 4. PP. 86-100. Emerald Group Publishing Limited.
35. Myers, P., 1996. *Knowledge Management and Organizational Design*. Butterworth-Heinemann.
36. Newell, S., Robertson, M., Scarbrough, H., and Swan, J., 2002. *Managing Knowledge Work*. Palgrave.
37. Nicolini, D., Powell, J., Conville, P. and Martinez-Solano, L. 2008. Managing Knowledge in the Healthcare Sector. A Review. *International Journal of Management Reviews*. Volume 10. Issue 3. PP. 245-263.
38. Oz, E., Jones, A. 2008. *Management Information Systems*. London: Cengage Learning EMEA.
39. Platt, N., 2004. Features - Change Strategies Are the Key to KM. [Online]. Available From: <http://www.llrx.com/features/changestrategies.htm>.
40. Roberston, J., 2003. Knowledge Management for Front-line Staff. Step Two Designs Pty Ltd. [Online]. Available From: [http://www.steptwo.com.au/files/kmc\\_frontline.pdf](http://www.steptwo.com.au/files/kmc_frontline.pdf).
41. Rogers G., Semple N., 2008. Knowledge Management is Not Just About Technology. *Data Management Review and SourceMedia, Inc.* Issue July 25 [Online]. Available From: [http://www.dmreview.com/dmdirect/2008\\_82/10001745-1.html](http://www.dmreview.com/dmdirect/2008_82/10001745-1.html).
42. Sanchez, R., 2000. "Tacit Knowledge" versus "Explicit Knowledge" Approaches to Knowledge Management Practice. [Online]. Available From: <http://www.knowledgeboard.com/download/3512/Tacit-vs-Explicit.pdf>.
43. Schutte M., Snyman M., 2007. Knowledge flow elements within a context – a model. [Online]. Available From:
44. [http://repository.up.ac.za/bitstream/handle/2263/1817/Schutte\\_Knowledge\(2006\).pdf?sequence=1](http://repository.up.ac.za/bitstream/handle/2263/1817/Schutte_Knowledge(2006).pdf?sequence=1)
45. Stacey, R., 2003. *Strategic management and Organizational Dynamics. The Challenge of Complexity*. 4<sup>th</sup> ed. Pearson Education Limited.
46. Tiwana, A., 2002. *The Knowledge Management Tool Kit. Orchestrating IT, Strategy, and Knowledge Platforms*. Pearson Education, Inc. 2<sup>nd</sup> edition.
47. Walker, S., 2006. 12 Steps to a successful KM program. *KM Review*. Vol. 9 Issue 4, PP.8-9.
48. White, D., Suter, E., Parboosingh, J., Taylor, E., 2008. Communities of Practice: Creating Opportunities to enhance Quality of Care and Safe Practices. *Journal of Healthcare Quarterly*. Volume 11. PP.80-P84.
49. Zaim, H., Tatoglu, E., Zaim, S. 2007. Performance of knowledge management practices: a causal analysis. *Journal of Knowledge Management*. Volume 11. Number 6. PP. 54-67. Emerald Group Publishing Limited.
50. Zikmund W., 2003. *Business research methods*. Thomson learning. 7th ed.