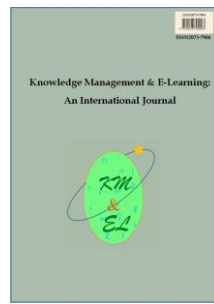# An empirical study of knowledge sharing: A case of South African healthcare system

Tope Samuel Adeyelure
Billy Mathias Kalema
Baji Linky Motlanthe
Tshwane University of Technology, Soshanguve, South Africa

An empirical study of knowledge sharing: A case of South African healthcare system

Tope Samuel Adeyelure*

Department of Informatics
Tshwane University of Technology, Soshanguve, South Africa
E-mail: adeyelurets@tut.ac.za

Billy Mathias Kalema

Department of Informatics
Tshwane University of Technology, Soshanguve, South Africa
E-mail: KalemaBM@tut.ac.za

Baji Linky Motlanthe

Department of Informatics
Tshwane University of Technology, Soshanguve, South Africa
E-mail: Baji.Motlanthe@thensg.gov.za

*Corresponding author

Abstract: The importance of knowledge sharing in healthcare organisations cannot be overemphasised. This is mainly due to the dynamic and sensitive nature of knowledge within the healthcare sector that can assist in caring for the patients and other administrative operations. The absence of knowledge sharing and retention practice in healthcare organisations may result in negative repercussions. Hence, using Actor-Network Theory, the study will investigate and identify the factors influencing the current knowledge sharing taking place within the South African healthcare system. One of the top healthcare organisations was selected for data collection, and a qualitative research method was adopted in this study. The findings revealed the different actors involved in the sharing of knowledge and the networks that enable knowledge sharing and retention. The study also highlights the factors that triggered knowledge sharing.

Biographical notes: Dr Tope Samuel Adeyelure possess a doctoral degree in Computer Science and Data Processing, a Master of Science in Business Information Technology, ON-diploma in Information Technology, and a Bachelor of Technology in Agric Engineering. He is an experienced Business Intelligence Analyst/Big Data Analyst/ Business Operation Analyst, who has done insurmountable work in big data analysis, business/information system model design, business analysis, virtual learning environment, e-commerce management, an accomplished researcher with several accredited international journal articles and conference papers. He has taught and presented to the international audience in his area of expertise.

Billy Mathias Kalema holds a Doctor of Technology Computer Science and Data Processing, a Master of Science in Computer Science, Postgraduate Diploma in Computer Science and a Bachelor of Science with Education. He is the Head of department Informatics, researcher, and mentor and has supervised and examined several postgraduate studies at both masters and doctoral level. Billy has spoken in various international conferences, Doctoral symposiums, seminars and workshops. He is a National Research Fund (NRF) rated researcher, member of the Association of Information Systems (AIS), Institute of Electrical and Electronics Engineers (IEEE); Information Society for Africa (IST-Africa), the International Association of Computer Science and Information Technology (IACSIT) and the Asian Council of Science Editors (ACSE). He serves on several technical committees as an Editorial board member and peer reviewer for both journals and conferences. Dr Kalema has published widely in several international peer-reviewed journals and conferences.

Baji Linky Motlanthe is currently the Director of Strategic Management in the National School of Government, a public service department in South Africa. She completed her Junior degree in Library and Information Science at the University of Limpopo (former University of the North) and completed her Honours degree in Information Science at the University of Pretoria. She holds a master's technology degree in Business Information Systems from the Tshwane University of Technology. Her research niches are knowledge management, strategic management, performance management and monitoring and evaluations in the public sector.

1. Introduction

According to Tetroe et al. (2008), knowledge sharing is critical to the healthcare sector (both government and private) as it can provide greater accountability and evidence-based practice in health planning, policy-making, and service delivery. From the health point of view, knowledge sharing is significant in ensuring that the relevant information gets to the right people and used for the right purposes at the right time (Du Plessis, 2007). This study, therefore, defines knowledge sharing as the interaction of patient information or knowledge between healthcare professionals. In this case, knowledge sharing should occur through collaborative communication channels so that knowledge about patient information is readily available and can be leveraged upon to provide the best possible healthcare services, to improve the quality of patient care and to achieve patient satisfaction.

According to Haughom (2014), solving problems and making decisions in healthcare is profoundly dependent on access to knowledge. In today's increasingly complex environment, it is becoming important for healthcare organisations to effectively manage both internal knowledge and externally generated knowledge to provide the best possible healthcare, achieve operational excellence and foster innovation. Bell et al. (2010) emphasise that a well-organized and effective strategy for knowledge management in healthcare can help organisations achieve these goals.

Management of the knowledge resources become increasingly essential, as the pressure on hospitals mounts to better their health systems and increase patient care (Wickramasinghe & Davison, 2004). The advantage of sharing and retaining knowledge, therefore, is to assist those in the organisation to benefit from the gathered knowledge

and information so as to improve service delivery to patients and, most importantly, to undertake an organisation's day-to-day operation efficiently and effectively.

2.   Background of the study

Knowledge plays an important role in the success of many organisations. According to Omotayo (2015), the important factors that are driving the need for knowledge sharing are organisational survival, competitive differentiation, globalisation effects and an ageing workforce. To maintain and acquire these benefits, many organisations dedicate massive resources to build knowledge management systems and promote knowledge sharing in their organisations. Desouza (2011) point out that without adequate care in how knowledge is managed, organisations will not be operating optimally, and this will result in the ineffective and inefficient creation and delivery of products and services leading to unsatisfied customers, which is what ultimately leads to the demise of the organisation.

According to (Saqib, Udin, & Baluch, 2017; Epetimehin & Ekundayo, 2011) knowledge management initiatives can benefit organisations to share important organisational understandings, to decrease redundant work, to avoid repeating same mistakes, to retain intellectual capital and to adapt to changing environments and markets over time. Edenius, Keller, & Lindblad (2010) in their study further looked at how knowledge can be managed across boundaries when implementing innovations. They concluded knowledge can be shared both on the semantic and pragmatic level.

Several studies (Sharma & Sharma, 2018; Blatt, 2008) supports this view by stating that, it is almost impossible for organisations to successfully deal with the organisation's multifaceted issues without dealing with issues of human capital (i.e., employees) within organisations. They further state there is a growing need for employees to get knowledge and information from colleagues in order to apply it to their daily functions, learn from it, and create more new knowledge needed for organisational growth. According to (Mushtaq & Rizwan, 2018; Lam, 2000) individual's knowledge cannot be separated from the organisation's knowledge, which is located in the minds, experience, and skills of individual employees. In addition, knowledge sharing influence positively organizational innovation which in turn has aids organisations in achieving their goals (Shafiei Nikabadi, Bagheri, & Mohammadi-Hoseini, 2016).

Knowledge sharing in healthcare is characterised by the dissemination of sensitive healthcare knowledge by and for healthcare stakeholders through a vast of communication medium in order to improve the amount of knowledge of the healthcare stakeholders (Abidi, 2001).

Healthcare organisations have different actors, such as a physician, surgeons, epidemiologist, nurses, medical students, laboratory technologists, and so on. These healthcare practitioners have gained specialised knowledge both theoretical and training experience and this knowledge have to be shared among them to improve patient care (Abidi, 2001). Sharing knowledge among healthcare professionals has been identified as being a critical factor for creating a quality healthcare system (Richardson, Abramson, & Kaushal, 2012). Sharing of knowledge in the healthcare sector can also improve the support and primary health processes, improve efficiencies and effectiveness, and improve the learning capacity of the organisation (Dutta, Brice, & Wallace, 2005).

To develop quality and safe hospital care, it is important that process improvement initiatives focus on knowledge sharing initiatives and collaboration among healthcare professional teams (Anthoine et al., 2014).

3. Research problem

With the increase in the population of South Africa of about 55 million, which is coupled with a decrease in life expectancy to an average of about 49.7 years, there is more pressure on the already under-resourced healthcare sector (McGinnis, 2016). Because of this growing population, healthcare institutions are required to accommodate more patients for preventive and end of life services. The healthcare system is not only faced with issues of lack of resources, but also a high turnover of employees and lack of trained employees (Guptill, 2011). The few employees in the system often change work from time to time, leaving the institution without skills required to carry out their daily operations (Tim, 2013). This results in difficulties in accessing patient records, monitoring disease information and difficulty in continuing with all other health-related operations.

Due to this high turnover of employees, healthcare institutions are currently faced with a shortage of healthcare practitioners, which impedes the ability of the sector to carry out its core mandate of patient care (Beath et al., 2012). Well, structured knowledge sharing may be one of the key solutions to this problem. Even though the importance of knowledge and experience sharing practices are mentioned by various studies (such as Ibrahim & Heng, 2017; Adem, 2010; Ipe, 2003; Andualem, Kebede, & Kumie, 2013), they are poorly practised especially in hospitals in South Africa. The absence of a systematic knowledge sharing retention program in hospitals results in various medical errors, missing-diagnosis, wrong treatment, increased multi-drug resistance and unprecedented deaths (Chetley, 2006).

Little to non-existence knowledge sharing in healthcare organisations can lead to medical errors, which can result in the increase in patients' deaths. Tabrizi and Morgan (2014), therefore, stressed that "knowledge sharing in the healthcare industry must not be a nice to have but a must have the process". However, studies (such as Abidi, 2001; Steventon et al., 2012; Loder, Bunt, & Wyatt, 2013) suggested that more studies are needed to give guidelines from different perspectives of how knowledge could be shared within the healthcare system.

Hence, the objective of this study is to investigate the current state of knowledge sharing and identify factors that influence knowledge sharing in the South African healthcare system.

The research questions of the study are specified as follows:

i.   What are the factors influencing knowledge sharing in the healthcare system?
ii. What are the current tools and techniques used for knowledge sharing in the healthcare sectors?
iii. What are the challenges of knowledge sharing in the healthcare sector?

4. Research theory

This study adopted the Actor-Network Theory (ANT) as its underpinning theory. ANT also known as enrolment theory, was first introduced to the social sciences during the mid-1980s by Bruno Latour and Michel Callon (Walsham, 1997). The term 'actor' is typically used to denote both human beings and non-human beings, such as technological artefacts that interact within networks of other actors (Walsham, 1997). Adam, Gluch, and Julin (2012) in their study investigates knowledge sharing in using Actor-Network Theory (ANT). They conceptualized the domain of their study as a heterogenous network consisting of several actants, human and non-human, in order to view the intricate nature of knowledge sharing from a different perspective. ANT is useful to understanding the processes of knowledge sharing within the organisational context. ANT`s emphasis on empirical inquiry allows the researcher to see the relations among different actors in the network (Doolin & Lowe, 2002). Paying attention to the actors' actions throughout the different stages of establishing the network, ANT assists in interpreting the events and explaining the outcome. ANT will be adopted to underpin the study so as to understand the essence of what is investigated in the study, and how to obtain knowledge about the phenomena studied.

5. Research methodology

Considering the empirical nature of the study, a qualitative approach was adopted. This is because the study is based primarily on narrative information collected from interviewees and direct observation. This allowed the researcher to get a better understanding of how knowledge is shared and retained in the organisation and allows for more follow-up questions until the subject was well-understood. The core element of a qualitative research approach is basically to connect meanings to the experiences of respondents and their lives. The qualitative method helped the researcher to understand the subject and be able to describe and analyse the processes of knowledge sharing in the healthcare organisation in a more detailed way by presenting the healthcare practitioners' views.

For this study, the Case Study was regarded as the most relevant design to capture the activities of the organisation in terms of knowledge sharing and retention. A prominent hospital was selected as the case for this study. The hospital situated in Gauteng province of South Africa is the 3rd largest hospital in the world, occupying around 173 acres, with approximately 3 200 beds and about 6 760 staff members. The facilities are housed in 429 buildings with a total surface area of 233 795 m2. Approximately 70% of all admissions are emergencies, including approximately 160 victims of gunshot wounds per month. Accident, emergency, and ambulance represent the busiest services, counting for over 350 daily patients. Every year, about 150 000 inpatients and 500 000 outpatient cases are registered. Approximately 60 000 patients per year are treated at the Maternity Hospital. Hence, this site is a high-volume site which results in the generation of a significant amount of information and knowledge. The study deemed it fit as a good case for intensive data gathering.

Various techniques can be adopted for data collection. An example of such techniques is written material, interviews, questionnaires, observation, focus groups discussions, protocols and different documents that may be relevant to the study (Jarvinen, 2000). For the purpose of this research, the data was sourced in the form of extensive interviews with the hospital's medical practitioners (physicians/doctors), professional nurses, and information and communication technology (ICT) specialists. In addition, the hospital's information, such as hospital strategies, procedure manuals,

hospital protocols and policies, provided during the study served as valuable sources of secondary data. Observation of knowledge sharing practices among the targeted participants was also used to validate the information gathered through the interviews and secondary data sources.

6. Results and discussion

6.1. Data analysis from the ANT View

6.1.1. Actors

Different actors (both human and non-human) were involved in the sharing of knowledge and information within the organisation. The actors' involvement in knowledge and information sharing were from different perspectives and for various purposes, aimed at improving patients care. According to one of the employees:

> *"Every Tuesday, we have a unit meeting where we sit and share information about our patients. In these meetings, there are Nurses, Doctors, Socials Workers, Clerks and all the stakeholders involved in this unit."*

In addition to the human actors, there were also non-human actors in the organisation who were also and complementarily involved in knowledge and information sharing. The non-human actors influenced and made differences on how, when, and where knowledge and information were shared among the stakeholders. One of the employees briefly explained as follow:

> *"The hospital has various IT systems including Management Information System (MIS), where the management and other staff members draw the reports/ information, they moved from using manual to use the MIS as they realised is more convenient."*

No actor acts in isolation to make a difference. Actors act and are acted upon within network.

6.1.2. Network

Networks are formed based on common interest and body of allies (Callon, 1991). The sharing of knowledge and information in the organisation was carried out through various networks. Some of the networks that existed in the organisation included the Senior Management team, Clinical team (Doctors), Medical speciality team and ICT team. One of the interviewees made an effort to explain how information is shared among the various networks that existed in the hospital:

> *"We share any kind of information, it could be a communication from the senior's management, communication via matrons (nursing managers) from the senior (CEO), information from doctors to nurses about the procedure they would like us to adhere to. Information on how you want things done."*

The healthcare practitioners utilize different technologies to make sure that information is shared with ease, at any time and, if possible, from various locations. One of the managers in the ICT department explained:

"We are having IT transversal system that we are using to access the blood results, that is blackberry application system; we collaborated with MTN, where any doctor can access blood results anytime and anywhere. We also have a system to trace the patients' diagnosis by requesting the X-ray results. When the Doctors are looking for X-ray results from radiologists, they use this system via the IT call Centre. We are also using Facebook to share information discussion about the doctors."

6.2. Four moments of translation

These are the differences which were engineered by actors within their networks to create a central network agreed by all the actors required negotiations which were carried through moments of translation (Callon, 1999). He further defined four categories of the moment of transition as listed below:

i.   Problematization: Identify the problem needed to be solved and the required actors.

ii.   Interest: Getting the actors interested through the negotiation of pertinent terms.

iii.   Enrolment: The roles allocated to the actors are accepted by them during interessment.

iv.   Mobilization: The wider population must be represented by the delegates.

Table 1 below illustrates the summarised outcome of the analysis as carried out through the four moments of translation.

Table 1
Four moments of translation for knowledge sharing in South African hospital system

Problematization:	Interessment:
In SAHS, how and why knowledge and information should be shared was initiated by Senior Management and need for proper patient care.	Many of the stakeholders which included Nurses, Operational Managers and Doctors were interested in the sharing of knowledge and information in the organisation. However, their interests varied, some were personal, and others were towards the organisation's objectives (for the benefits of patients care).
Mobilization:	**Enrolment:**
Operational Nursing Managers used their authority and took the responsibility of encouraging and persuading individuals and groups to share information and the knowledge they acquired over time. This was to make sure that all the interested actors take part in the sharing of knowledge.	Both Healthcare workers and non-healthcare workers (such as ITC) enrolled in the sharing of knowledge and information. The enrollment of individuals and groups were voluntary, sometimes mandatory. Some of the reasons for enrolling in the activity, included patients care, self-development and career growth.

6.3. Findings and discussions

6.3.1. What are the factors influencing knowledge sharing in the healthcare system?

The findings from this study show an understanding of the influencing factors on knowledge sharing in the case study. The factors are as follows:

a) **Management**: Management plays a vital role in developing plans and enforcing decision making in organisations. It is, therefore, true that the management in this organisation strongly encourages knowledge sharing and teamwork and acknowledges that in a hospital environment one cannot work in isolation. They regard the aim of knowledge sharing like sharing all opinions, ideas, experiences, skills, and suggestions as helpful (Dalkir & Beaulieu, 2017). There is a need for organizations to also to improve Knowledge Management Systems (KMS) quality, in order to motivate the employees to continuously use it (Budiardjo et al., 2017).

This is supported by the study by Lee, Kim, and Kim (2006) which revealed that top management support to knowledge sharing impacted the quality and level of sharing knowledge. The support of coworkers and their supervisor as well as their encouragement for sharing knowledge can also be an influencing factor in knowledge sharing (Kulkarni, Ravindran, & Freeze, 2006).

b) **Patient care**: Healthcare practitioners are sharing knowledge for better patient care management. After conducting the interviews in all the targeted medical units, it was clear that knowledge and information sharing is important for employees in order to perform their daily tasks. Interviews with different practitioners revealed that communication and sharing of knowledge are of utmost importance in order for them to fulfil the health care mission pledge of "caring is our mission". This was also supported by (Ben Hamouda et al, 2015) in their study.

c) **Self-Development**: The need for self-development and career development also came out as one of the influencing factors that encourage healthcare practitioners to share knowledge with their colleagues. Employees also attend training, workshops, and some are even furthering their studies in a quest to gain more knowledge for their career development.

This is in line with the statement of Karia and Asaari (2006) that employee empowerment and the willingness of an employee to self-develop positively affects organisational commitment, and organisational commitment has a positive relationship with knowledge sharing.

6.3.2. What are the current tools and techniques used for knowledge sharing in the healthcare sectors?

There are different methods of sharing information and knowledge among employees. This study showed that knowledge is shared among employees mostly through personal contact meetings, in-service training, workshops, symposiums, and conferences. ICT technologies, such as email and other transversal systems, are also used as a method of information sharing. Information is also shared using hospital documents like policies, procedure manuals, hospital protocols, which are accessible to everybody at all the times.

a)   Formal and informal meetings

All the medical departments have their daily, weekly, and monthly meetings where they discuss issues that impact their work. Various healthcare practitioners are involved in these meetings, which contribute to knowledge sharing in the organisation. In all these meetings, the knowledge that is not easy to share through explicit means is mainly shared face-to-face among the employees.

They also organise one monthly meeting where different practitioners who have an interest in the same subject convene and discuss related issues. This provides an opportunity for the practitioners to learn more and share experiences with each other. There are also meetings convened with other health practitioners from other hospitals. In these meetings, all the interested parties meet and share information and knowledge on the issues that affect their work, problems they encounter and their solutions. In these forums, constant interaction between explicit and tacit knowledge occurs.

b)   Doctors rounds

It is a norm that every time a doctor makes rounds to see patients, he or she is accompanied by other related healthcare practitioners. This mostly includes junior doctors, nurses and allied service practitioners. This is done to make sure that not only the doctor has knowledge about the patient's diagnosis, but also, all other parties. This is another way of teaching and, in turn, knowledge sharing with others.

During rounds, doctors explain and discuss the relevant information with all practitioners involved. This was observed in the Renal Medical Unit, as the doctor was seeing a patient. Firstly, the doctor made sure that all parties are present with him, and went on to explain all the medical procedures he was going to undertake. Questions were asked during the treatment by both the junior doctors and nurses, and the doctor answered all questions. Some of the practitioners also had books with them to take notes of the important information. All the information about the patient was written in the patient's file so that when another doctor comes, he or she knows the status of the patient.

c)   Internal academic day

This is a forum for discussing medical cases held weekly on Wednesdays in the hospital. In this forum, doctors are encouraged to present clinical papers and cases. The hospital does not command attendance to this forum, and it is, therefore, the responsibility of an individual to voluntarily participate. Nevertheless, the meetings have been going on for a long time and are attended by doctors of different specialities as well as other interested healthcare practitioners. Doctors from neighbouring hospitals are also invited to participate in this forum.

This forum brings together different healthcare practitioners to discuss patients' cases. The objective is mainly to share knowledge about patients and to determine an appropriate course of action. The medical doctors also select the cases of different patients and present them to the group.

d)   Workshops, conferences, and symposiums

Most South Africa healthcare encourages its employees to attend formal national and international conferences, workshops, and symposiums where different medical-related issues are discussed. Workshops are also held between different hospital departments regarding ongoing programs, current issues, and experiences. During

these workshops, more experienced employees educate their peers on different subjects or present their cases in more detail. Education in the organisation occurs daily as the practitioners are nursing the patients. Doctors explain the procedures to junior doctors and nurses as they work. Nursing managers also take the responsibility of continuously teaching and orientating the newly recruited nurses.

e)   Hospital documents

All interviewees stated that there are various documents containing information that is important to their work. The documents include policies, procedure manuals, hospital protocols, quality assurance documents and many others. It was discovered that all the employees have access to these documents, as they are stored in places where it is easy for all to access. The documents are stored manually, and updated as and when is necessary. Employees explained that the documents usually work as a starting point of references.

During the study, the researcher observed and confirmed the documents' availability. The documents are stored and classified in a way that is easy for retrieval. The documents are also easy to use. These documents are available in all the hospital medical units, and all healthcare practitioners in those units have access to them. The documents are updated to be relevant to the information needs of the employees at all the time.

f)   ICT Transversal systems

Sharing of knowledge in the organisation also takes place through emails, intranet, and other ICT transversal systems. During the interviews, the Information Technology IT manager also mentioned the introduction of new systems namely; Radiology Information System (RIS) and Picture Archiving System PAS. There will also be an archiving system for X-ray images, whereby a patient file will be linked to the X-ray image. This assists other health practitioners in accessing the patient's files with ease. There is also a Facebook page for some doctors at the selected hospital, which allows them to share knowledge and information.

6.3.3. What are the challenges of knowledge sharing in the healthcare sector?

Most employees admitted that there were challenges that made it impossible to share knowledge with others in the organisation. The interesting part was that the low-level practitioners reported more problems than the high-level ones.

a)   Time constraints

The biggest impediment to knowledge sharing identified by the participants was the time factor. Most of the respondents complained of a lack of time to share knowledge. They explained that due to the nature of their work, they do not get time to convene with colleagues and share information and knowledge. Health practitioners were mostly overwhelmed with work pressures and, therefore, failed to share critical knowledge and information with colleagues. Below are some examples of comments shared by respondents about time constraint.

> *"I am stealing 30 minutes of my time for this interview. Even for attending the meeting, we sometimes send other people because there is no time to go there. We sometimes lose opportunities to attend workshop and symposium because we are always busy in this hospital."*

"Time is a major issue in this hospital. No one has extra time to devote to the knowledge sharing."

"The numbers of patients we are seeing are too much, the staff members are limited, and there is a serious shortage, and that makes it difficult for us to get enough time to sit and share with others."

"I think the shortage of staff is the main challenge. When one is in the ward it is difficult to go out and do other things. If we can have enough staff, it would be possible to go out to meet other people and are able to share."

"Nurses are overloaded. You find that one nurse is looking after 40 patients."

These findings are in line with what Zhou and Nunes (2016) who revealed in their study that healthcare practitioners are very busy and have a lot of work, and are, therefore, more concerned with attending to the immediate needs of the patients and were likely not to prioritise necessary communication and knowledge sharing.

b)   Technology constraints

The study revealed a technology-related barrier to knowledge sharing. Most of the participants reported insufficient technology resources, such as computers and access to the internet, which facilitate easy access to information. Though most of the healthcare practitioners are computer literate, in many cases more than 10 employees are sharing one or two computers in many medical departments. The shortage of computers makes the sharing of information very difficult.

Participants' comments illustrate these points to emphasise the constraints:

"Most do not have access to the internet, and only use manual documents to access information."

"Most of the healthcare practitioners can access the internet from the library which operates only 8 hours in a day."

"The only way to share electronic information is through e-mail. Electronic communications are not always clear and often require verbal follow-up. It is most difficult to project the proper meaning of the information via e-mail."

"Hospital documents like procedure manuals, policies etc. are stored manually, and will only be shared on one physical location."

"The organisation does not have proper knowledge management system for knowledge sharing, and the employees rely solely on emails to share the information."

This is in line with what Gorry (2008), who conducted two case studies on knowledge sharing in the public sector in the United State of America, found that inadequate technology is one of the main barriers to knowledge sharing. Sucahyo et al. (2016) in their study listed IT infrastructure has one of the determinants to effective knowledge management adoption within an organization.

c)   Language barrier

Language is the instrument that individuals employ to communicate what they know. Another problem discovered in this study was the problem of the lack of common language. There are health practitioners from different races and ethnic groups in this organisation. The most popular languages used by employees in this organisation are

IsiZulu and English. Other languages include Tswana, Venda, and Sepedi. Employees feel more comfortable using their local vernacular, which cannot be understood by all. Employees are expected to use English as a medium of communication, but sometimes others decide to speak in their own vernacular.

The important role of language in the knowledge sharing process is described by Husted and Michailova (2002); language is even more vital when differences in native languages of the employees increase the ambiguity substantially. In their study, they revealed that good verbal and written communications are essential for effective knowledge sharing.

Other challenges identified include resistance to change, attitudes of a person giving or receiving information, and lack of recognition by management. The challenges identified provide evidence that the organisation needs to improve how it promotes knowledge sharing.

7. Limitation of the study

Knowledge management is an extensive area to study. Taking that into consideration, this study only focused on knowledge sharing and issues related to it. There are many healthcare organisations/hospitals in South Africa, but this study only conducted the research in one public hospital, thus limiting the generalisation to other hospitals. And, the fact that the study was only conducted in one hospital, it may not produce the same findings if it was conducted in other hospitals. In the selected organisation, there are many different business units which are dependent on knowledge sharing for the effective functioning of its operations; however, the researcher chose to focus on the core business of the organisation which is healthcare. Even though the study was conducted on almost all the medical units in the organisation, it was not possible to interview all the healthcare professionals in those units, thus the views of this research may be limited to only those that participated.

8. Conclusion

The study identified the actors and the network that is involved in knowledge sharing. By answering the three research questions, the study revealed that there are sufficient tools and techniques to allow the sharing of knowledge in the organisation, and most of the healthcare professionals are aware and make use of those tools. Most of the healthcare professionals are sharing knowledge without even realising they are doing it, as it is part of their daily activities. The traditional face-to-face knowledge sharing approaches are mostly adopted. In hospitals, it is a norm for doctors to be accompanied by other healthcare practitioners like nurses when taking patients around.

The study also revealed that ICT plays a pivotal role in the sharing of knowledge in hospitals. Most healthcare practitioners make use of ICT in their daily activities. ICT facilities, which are mostly the computer, were found to be inadequate in all areas of the hospital. Challenges to sharing knowledge exist. The identified challenges were time constraints, technology constraints, and language barrier. Some of the healthcare practitioners are still reluctant and do not participate fully in knowledge and information sharing in this organisation. Some employees blamed management for not playing an enough role in encouraging knowledge sharing. Time constraints was a common

challenge to all the healthcare practitioners due to the nature of their work and more so the size of the hospital and the numbers patients it caters for.

ORCID

Tope Samuel Adeyelure ⓘ https://orcid.org/0000-0002-6138-4285

Billy Mathias Kalema ⓘ https://orcid.org/0000-0002-2405-9088

References

Abidi, S. S. R. (2001). Knowledge management in healthcare: Towards "knowledge-driven" decision-support services. *International Journal of Medical Informatics, 63*(1/2), 5–18.

Adam, A., Gluch, P., & Julin, J. (2012). Using actor-network theory to Understand knowledge sharing in an architecture firm. In *Proceedings of the 30th Annual Conference of Association of Researchers in Construction Management (ARCOM)*. Portsmouth, UK.

Adem, A. (2010). *Knowledge sharing among health professionals: The case of Felege Hiwot Referral Hospital, Bahir Dar*. Addis Ababa University, Ethiopia.

Andualem, M., Kebede, G., & Kumie, A. (2013). Information needs and seeking behaviour among health professionals working at public hospital and health centres in Bahir Dar, Ethiopia. *BMC Health Services Research, 13*: 534.

Anthoine, E., Delmas, C., Coutherut, J., & Moret, L. (2014). Development and psychometric testing of a scale assessing the sharing of medical information and interprofessional communication: The CSI scale. *BMC Health Services Research, 14*: 126.

Beath, C., Becerra-Fernandez, I., Ross, J., & Short, J. (2012). Finding value in the information explosion. *MIT Sloan Management Review, 53*(4), 18–20.

Bell, L. M., Grundmeier, R., Localio, R., Zorc, J., Fiks, A. G., Zhang, X., Stephens, T. B., Swietlik, M., & Guevara, J. P. (2010). Electronic health record-based decision support to improve asthma care: A cluster-randomized trial. *Peadiatrics, 125*(4), e770–e777.

Ben Hamouda, I., Feki, M., Boughala, I., & Chourabi, O. (2015). Understanding knowledge sharing in healthcare system. In *Proceedings of the Mediterrannean Conference on Information System*.

Blatt, R. (2008). Organizational citizenship behavior of temporary knowledge employees. *Organization Studies, 29*(6), 849–866.

Budiardjo, E. K., Pamenan, G., Hidayanto, A. N., Meyliana, & Cofriyanti, E. (2017). The impact of knowledge management system quality on the usage continuity and recommendation intention. *Knowledge Management & E-Learning, 9*(2), 200–224.

Callon, M. (1991). Techno-economic networks and irreversibility. *The Sociological Review, 38*(1_suppl), 132–161.

Callon, M. (1999). Actor-network theory — The market test. *The Sociological Review, 47*(1), 181–195.

Chetley, A. (2006). *Improving the health, connecting people: The role of ICTs in the health sector of developing countries*. Retrieved from http://www.infodev.org/infodev-files/resource/InfodevDocuments_84.pdf

Dalkir, K., & Beaulieu, M. (2017). *Knowledge management in theory and practice*. Cambridge, MA: The MIT Press

Desouza, K. C. (2011). Securing intellectual assets: Integrating the knowledge and

innovation dimensions. *International Journal of Technology Management, 54*(2), 167–203.

Doolin, B., & Lowe, A. (2002). To reveal is to critique: Actor–network theory and critical information systems research. *Journal of Information Technology, 17*(2), 69–78.

Du Plessis, M. (2007). Knowledge management: What makes complex implementations successful? *Journal of Knowledge Management, 11*(2), 91–101.

Dutta, I., Brice, P. C., & Wallace, S. (2005). Knowledge sharing and "genomic" healthcare. *Nature Biotechnology, 23*(2), 169–170.

Edenius, M., Keller, C., & Lindblad, S. (2010). Managing knowledge across boundaries in healthcare when innovation is desired. *Knowledge Management & E-Learning, 2*(2), 134–153.

Epetimehin, F. M., & Ekundayo, O. (2011). Organisational knowledge management: Survival strategy for Nigeria insurance industry. *Interdisciplinary Review of Economics and Management, 1*(2), 9–15.

Gorry, G. A. (2008). Sharing knowledge in the public sector: Two case studies. *Knowledge Management Research & Practice, 6*(2), 105–111.

Guptill, J. (2011). Knowledge management in health care. *Journal of Health Care Finance, 31*(1), 10–14.

Haughom, J. (2014). *Innovation in healthcare: Why it's needed and where it's going*. Health Catalyst. Retrieved from https://www.healthcatalyst.com/innovation-in-healthcare-why-needed-where-going

Husted, K., & Michailova, S. (2002). Diagnosing and fighting knowledge-sharing hostility. *Organizational Dynamics, 31*(1), 60–73.

Ibrahim, S., & Heng, L. H. (2017). The effect of individual motivational factors towards knowledge sharing at small and medium enterprises. *International Journal of Knowledge Management Studies, 8*(3/4), 201–231.

Ipe, M. (2003). Knowledge sharing in organizations: A conceptual framework. *Human Resource Development Review, 2*(4), 337–359.

Jarvinen, P. H. (2000). Research questions guiding selection of an appropriate research method. In *Proceedings of the Eighth European Conference of Information Systems* (pp. 124–131).

Karia, N., & Asaari, M. H. A. H. (2006). The effects of total quality management practices on employees' work-related attitudes. *The TQM Magazine, 18*(1), 30–43.

Kulkarni, U. R., Ravindran, S., & Freeze, R. (2006). A knowledge management success model: Theoretical development and empirical validation. *Journal of Management Information Systems, 23*(3), 309–347.

Lam, A. (2000). Tacit knowledge, organizational learning and societal institutions: An integrated framework. *Organization Studies, 21*(3), 487–513.

Lee, J.-H., Kim, Y.-G., & Kim, M.-Y. (2006). Effects of managerial drivers and climate maturity on knowledge-management performance: Empirical validation. *Information Resources Management Journal, 19*(3), 48–60.

Loder, J., Bunt, L., & Wyatt, J. C. (2013). *Doctor know: A knowledge commons in health*. NESTA. Retrieved from www.nesta.org.uk/home1/assets/features/doctor_know_a_knowledge_commons_in_health/

McGinnis, J. M. (2016). Income, life expectancy, and community health: Underscoring the opportunity. *JAMA, 315*(16), 1709–1710.

Mushtaq, I., & Rizwan, A. (2018). Obstacles to knowledge sharing in engineering organisations: A quantitative approach. *International Journal of Knowledge Management Studies, 9*(3), 293–307.

Omotayo, F. O. (2015). Knowledge management as an important tool in organisational management: A review of literature. *Library Philosophy and Practice (e-journal).* Retrieved from http://digitalcommons.unl.edu/libphilprac/1238/

Richardson, J. E., Abramson, E. L., & Kaushal, R. (2012). The value of health information exchange. *Journal of Healthcare Leadership, 4*, 17–23.

Saqib, M., Udin, Z. M., & Baluch, N. (2017). The impact of knowledge management on organizational performance in today's economy. *South East Asia Journal of Contemporary Business, Economics and Law, 12*(3), 25–33.

Shafiei Nikabadi, M., Bagheri, S., & Mohammadi-Hoseini, A. S. (2016). Effects of knowledge management strategy and organizational learning capability on innovation-driven performance in an oil company. *Knowledge Management & E-Learning, 8*(2), 334–355.

Sharma, K., & Sharma, V. (2018). Evaluating knowledge management practices in Indian manufacturing and service industry: An overview. *International Journal of Knowledge Management Studies, 9*(3), 222–242.

Steventon, A., Bardsley, M., Billings, J., Dixon, J., Doll, H., Hirani, S., Cartwright, M., Rixon, L., Knapp, M., Henderson, C., Rogers, A., Fitzpatrick, R., Hendy, J., & Newman, S. (2012). Effect of telehealth on use of secondary care and mortality: Findings from the whole system Demonstrator cluster randomised trial. *BMJ, 344*: e3874.

Sucahyo, Y. G., Utari, D., Budi, N. F. A., Hidayanto, A. N., & Chahyati, D. (2016). Knowledge management adoption and its impact on organizational learning and non-financial performance. *Knowledge Management & E-Learning, 8*(2), 387–413.

Tabrizi, N. M., & Morgan, S. (2014). Models for describing knowledge sharing practices in the healthcare industry: Example of experience knowledge sharing. *International Journal of Management and Applied Research, 1*(2), 48–67.

Tetroe, J. M., Graham, I. D., Foy, R., Robinson, N., Eccles, M. P., Wensing, M., Durieux, P., Legare, F., Nielson, C. P., Adily, A., Ward, J. E., Porter, C., Shea, B., & Grimshaw, J. M. (2008). Health research funding agencies' support and promotion of knowledge translation: An international study. *The Milbank Quarterly, 86*(1), 125–155.

Tim, M. (2013, August 19). Nurse hiring reminds difficult, hurting staff morale and patient care, survey shows. *McKnight's Long-Term Care News & Assisted Living.*

Walsham, G. (1997). Actor-network theory and IS research: Current status and future prospects. In *Proceedings of the IFIP TC8 WG 8.2 International Conference on Information Systems and Qualitative Research* (pp. 466–480). Philadelphia, Pennsylvania, USA.

Wickramasinghe, N., & Davison, G. (2004). Making explicit the implicit knowledge assets in healthcare: The case of Multidisciplinary teams in care and cure environments. *Health Care Management Science, 7*(3), 185–195.

Zhou, L., & Nunes, M. B. (2016). Barriers to knowledge sharing in Chinese healthcare referral services: An emergent theoretical model. *Global Health Action, 9*(1): 29964. doi: 10.3402/gha.v9.29964